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**The 'Telling Stories' Project:  
A case series study of narrative interaction between  
children who use speech generating devices and their  
educational staff**

Philippa Bailey

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**“Great stories happen to those who can tell them.”  
– Ira Glass**

# Abstract

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Story-telling is important to child language development and plays a critical role within the English National Curriculum. Children who use Augmentative and Alternative Communication (AAC) have limited opportunities to develop narrative compared to their typically developing peers. The current study aimed to explore narrative construction in communicative dyads comprising an aided speaker (AS) and natural speaker (NS).

A case series design was employed to investigate narrative interactions of children who use AAC with a familiar member of teaching staff. The sample comprised four children, two with cerebral palsy, one with autistic spectrum disorder and one with a genetic condition. Data collection took place at the school attended by each participant. Video capture was used to record one personal and one fictional narrative in four separate data collection sessions with each dyad. Data were transcribed using standard orthography. Three dependent variables were investigated: communicative modality, linguistic move-type and linguistic complexity. A subsidiary study was completed to test the reliability of Momentary Time Sampling in coding interactional data.

The findings revealed multimodal contributions from both interlocutors. Speech was the dominant modality for all NS participants. Communicative modality use was more varied for the AS. NS participants assumed a more dominant, initiating role. Analysis highlighted patterns of frequent directives, such as instructions and w-question and yes/no question employed by the NS followed by AS responses during narrative interaction. However, some miscommunication between interlocutors was also recorded.

Narrative interaction was found to follow the educational initiation-response-feedback framework, although there was evidence of the AS and NS working together to construct narrative. Implications include the need for NS scaffolding within education to support AS access to narrative language. The case series serves to illustrate some of the challenges associated with narrative production for children who use AAC and the associated relevance of the NS' role.

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# Chapter One

## Introduction

---

### 1.1 Overview

This study examined the narrative interactions of individuals who use Augmentative and Alternative Communication (AAC) with familiar educational staff. This chapter explores the context within which the aims of the current study are grounded. The theoretical background is provided by Scherer's (1993) Matching Person and Technology (MPT) model. The MPT model identifies three salient areas for the successful use of AAC: the environment experienced by the user (milieu), the individual characteristics of the person using the technology (person) and the assistive technology in use (technology) (Scherer, 1993). More recently, Hersh and Johnson (2008) have developed the Comprehensive Assistive Technology (CAT) model, which extends the concepts introduced in the MPT model. Similarly, it identifies the individual, context and technology, with the addition of activity. These models provide the infrastructure of the following two chapters. The more specific person/individual characteristics of language development and narrative acquisition are addressed in Chapter Two (p.28). The current chapter focuses on the AAC technology in use and the milieu for narrative production. The 'technology' area covers AAC, contextual features and prevalence of usage. Following this, the wider milieu of Government legislation in England and Wales regarding education and the inclusion of individuals with special educational needs and disabilities (SEND) is examined, with particular reference to the National Curriculum of England, Wales and Northern Ireland. The underlying pedagogies of teaching-learning are reviewed in relation to the child who uses AAC. Finally, against this context, the aims of the current study are articulated.

## **1.2 The 'Technology' of AAC**

### **1.2.1 What is AAC?**

AAC is any form of communication that is used to support or replace spoken communication (Von Tetzchner and Martinsen, 2000). It incorporates a range of communication techniques and physical devices or systems. AAC is typically divided into unaided and aided methods. Unaided methods invoke the use of the body's natural gestural systems, as seen in manual signing (e.g. British Sign Language). Aided methods, are defined by the introduction of an artificial object or thing. They range from the low or soft technology options to high technology (Von Tetzchner and Martinsen, 2000). A low technology device might involve the use of symbols and pictures displayed in a communication book or board. A high technology (high-tech) device might display symbols on a tablet computer that provides a digitised speech output (Von Tetzchner and Martinsen, 2000).

Individuals who use AAC span a wide age range and include those with various developmental and medical conditions (Beukelman and Mirenda, 2005). Typically, these are children, adolescents and adults who are unable to communicate effectively through speech, which may be variously associated with conditions such as autistic spectrum condition, learning disability, cerebral palsy and developmental apraxia of speech (RCSLT, 2006). The current study focuses on young people who use high-tech AAC devices.

The software and hardware systems available in AAC devices are considered critical factors in the resultant communication process (Stuart, 2000, Soto, Hartmann and Wilkins, 2006). High-tech AAC comes in a range of formats, from handheld devices to wheelchair mounted aids, but most contain a similar software package enabling communication through digitised voice output (Von Tetzchner and Martinsen, 2000). More recently, high-tech AAC has moved towards the use of Windows-enabled computer aids. These devices enable dual operation of Windows programs and communication software, the former allowing the facility for e-mail and internet access thereby providing greater potential for independence.

Commercially available AAC devices usually reflect the newest technology available, which also tend to provide increased functionality for the individual who uses AAC. However, the most advanced devices are often the most expensive, potentially limiting universal access (Higginbotham, Shane, Russell and Caves, 2007b). Even the most technologically-advanced devices still limit the user to the ready programmed vocabulary, syntax options and overall capacity (Romski, Rose, Lauren and Roger, 2005, Murray and Goldbart, 2006). Furthermore, there is a tension between the development of AAC technology and the research evidence demonstrating effective usage (Williamson, 2002). For example, Higginbotham et al. (2007b) recognised that innovations in AAC were mainly technological in type. The validity and functional potential of modern communication aids have been acknowledged, whilst also recognising the limited research evidence-base underpinning technological developments being made (Stuart, 2000, Beukelman and Mirenda, 2005).

### **1.2.2 AAC usage**

Currently there is little published information regarding the number of people who use AAC. By reviewing data from both the United States of America (USA) and United Kingdom (UK), the Royal College of Speech and Language Therapists (2006) estimated that a range of 0.3-1.4% of the total population require the use of some form of AAC system. Communication Matters ([www.communicationmatters.org.uk](http://www.communicationmatters.org.uk)), the UK chapter of the International Society for Augmentative and Alternative Communication (ISAAC: [www.isaac-online.org](http://www.isaac-online.org)), suggest that there are an estimated 365,000 people who use AAC in the UK; approximately 0.59% of the general population (CommunicationMatters, 2009). Within the population of school age children, Blackstone (1990) estimated 0.2-0.6% require the use of AAC. This is supported by Norwich and Grove (1997) who, through a survey of special and mainstream schools in eleven London Boroughs, estimated that in excess of 10% of statemented children (0.3% of the school population) are in need of AAC systems. Previously, it had been suggested that these figures may well be conservative (RCSLT, 2006). However, most recent estimations of AAC requirement within the UK remains at 0.5% according to Enderby, Judge, Creer and John (2013). This equals approximately 529 per one hundred thousand of the population.

## **1.3 Legislation and Government Policy**

### **1.3.1 Disability and education**

There is a raft of U.K. government legislation and policies designed with the specific aims of encouraging and supporting 'inclusion' in education. It exists to counteract the vulnerabilities frequently experienced by people living and growing up with disabilities (Chappel, 1998). For example, in the past, without improved access and opportunity in education, children with SEND often under-achieved academically and became marginalised in society (Finkelstein, 1993). The Special Educational Needs and Disability Act (DfES, 2001) was the first piece of legislation to specify that children with disabilities must not be placed at any 'substantial disadvantage' in comparison to their non-disabled peers. As a result, institutions are required to ensure provisions such as auxiliary aids and support services are in place to prevent any such disadvantage (Bunning, 2004). This was further supported by one of the most fundamental papers relating to disability, the 1995 Disability Discrimination Act, which was later updated in 2005 (DfEE, 2005). This act sets out the ways in which people with disabilities must not be discriminated against, within employment, education and everyday life. In relation to the young people included in the current study, the section relating to education is the most relevant.

The Disability Discrimination Act (DfEE, 2005) also states that pupils with a disability must not be discriminated against or experience disadvantage due to their SEND. Schools must provide detailed plans of how they will increase access to the curriculum for pupils with SEND (DfEE, 2005). Access to the curriculum was highlighted by the government-commissioned, review of children with communication needs in England and Wales led by John Bercow (2007-8). The final report highlighted the critical nature of communication as a human right and an essential life skill that is central to all social interaction (Bercow, 2008). One of the principal recommendations was the removal of the perceived barriers to the National Curriculum for children with SEND, such as the impact of a communication impairment on the development of literacy skills (Bercow, 2008). Increased support for individuals with communication difficulties was also identified as a priority. Further to this, the Every Child Matters charter developed as part of the 2004 Children Act (DfCSF, 2004) created five principles, including 'enjoy and achieve'. This incorporated 'stretching' national standards at primary

and secondary school to ensure the continued achievement of all children (DfCSF, 2004). As a consequence of The Human Rights Act (DfEE, 1998), which came into force in October 2000, it is also now possible for individuals to make legal challenges against breaches of any of the above Acts through the courts (Swain, French and Cameron, 1993).

One fundamental need stressed in all of the above legislation is the opportunity for any child to achieve their academic potential, with no limitations imposed by their SEND.

### **1.3.2 Communication and the National Curriculum**

The National Curriculum of England, Wales and Northern Ireland is described as a 'curriculum for all'. It provides guidance on the design and delivery of subjects at the various stages of statutory education and includes adjustments to enable access for students with SEND (QCDA, 1999). For children with SEND who are working towards the National Curriculum, but are below the first academic attainment level of Key Stage 1, P Scales are used to measure and record achievement (Qualifications and Curriculum Authority, 2007). Both the National Curriculum and P scales include sections within English relating to 'Speaking and Listening'. Narrative, as the focus of the current study, is represented at P scale 7, which includes the use of phrases with up to three key words (using speech, signs or symbols) to communicate simple ideas, events or stories (Qualifications and Curriculum Authority, 2007). The National Curriculum for England has been re-written and was re-published in September 2013. Changes to the curriculum are to be taught in schools from September 2015. At Key stage 1 in the existing curriculum, students are expected to tell both real and imagined stories, read aloud, describe experiences and talk to a range of people including peers, teachers and other adults (QCDA, 1999). Within narrative language, children are expected to identify and describe characters, events and settings in fiction, and to use knowledge of sequence and story language when retelling stories and predicting events (QCDA, 1999). The new National Curriculum has removed speaking and listening criteria at each Key stage, and instead provides an overview of attainment in 'spoken language' to be reached during academic years two to six (DfE, 2013). These attainments include the child being able to give well-structured descriptions, explanations and narratives for

different purposes, including the expression of feelings (DfE, 2013). Despite the new curriculum for English reducing the areas of attainment for 'spoken language' the emphasis on a child's knowledge and use of different forms of narrative is still present. The existing National Curriculum was in use throughout this study and therefore is the predominant point of reference. Comments regarding the implications of the new curriculum for English, in relation to the findings of this study, are made in Chapter Six. The current P Scales and Key stage 1 criteria for attainment in English are provided alongside the new 'spoken language' criteria as a reference in appendices A.1 and A.2.

For a child who uses AAC, educational attainment is likely to be more challenging than for their typically developing (TD) peers who are able to use speech. Although the Bercow Report (Bercow, 2008) emphasised the need to remove such barriers to the curriculum for children with SEND, the optimal route for achieving this has yet to be established.

Not only does narrative appear as a medium for attainment of key learning objectives at the various Key Stages, but also is implicit in the recommended teaching-learning pedagogy that currently drives classroom practice. This is discussed in the following section.

## **1.4 Teaching-Learning Pedagogies**

### **1.4.1 Within mainstream education**

Classroom discourse differs from conversational interaction (Musumeci, 1996). The authoritative role of the teacher and the function of classroom interaction in relation to educational goals are factors of influence (Walsh, 2006). Walsh (2006) identified four principal features of classroom discourse, that were the teachers' responsibility: control of the patterns of communication, employment of elicitation techniques, use of repair strategies and the modification of their own speech to facilitate learning. The most commonly identified pattern of interaction observed in classrooms is the Initiation, Response, Feedback (IRF) sequence first defined by Sinclair and Coulthard (1975). This framework has also been referred to as the Initiation, Response, Evaluation (IRE) Framework (Hardman, 2008).



The IRF framework consists of three moves: teacher initiation, often a question; student response, usually an answer to the question; teacher follow-up or feedback. The teacher therefore makes two moves to every single move by the student, taking two thirds of all communicative moves within the interaction. Walsh (2006) identified four reasons why the IRF framework was so frequently used in classroom discourse. Firstly, the question and answer sequence is seen as appropriate to the roles occupied by teacher and student. Secondly, the power relationship between teacher and student lends itself to the teacher initiating and taking the majority of moves. Thirdly, provision of feedback enables positive reinforcement, facilitating learning. Fourthly, the succinct nature of IRF interaction is efficient in extracting responses from students and therefore works to the teachers' time constraints (Walsh, 2006). Although the IRF helps to manage a class and maintain the attention of students, it may be seen as constraining the opportunity for learning through discussion, as advocated by Barnes (2008). However, recent studies have shown effective use of the IRF framework as an effective learning tool that can lead to developed discussion (Alexander, 2004).

The IRF sequence is most frequently initiated by a teacher-led question. Different types of question serve a number of different purposes within the classroom. For example, questions may be used to denote turns, aid clarity of information being given, provide opportunity for involvement or even impose participation (Walsh, 2006). Therefore, depending on the pedagogic goal, different types of question will be the most appropriate. Walsh (2006) suggested that whether a question produced a communicative response from the student was secondary to whether it served its purpose in facilitating the student to achieve the pedagogic goal. The use of questions in classroom discourse is different to conversational interaction. Questions within the classroom serve to encourage involvement in contrast to conversational questions, predominantly used to elicit information (Walsh, 2006). In order to enable students to achieve their academic goals, teachers must therefore have a good understanding of different types of question and how to employ them successfully (Nunn, 1999).

Through observation of primary level literacy hour, Hardman, Smith and Wall (2005) found that the majority of classroom interactions involved a high frequency of closed type questions, used to guide students to the required response. Teachers employed few open questions or strategies to encourage

children to elaborate and develop their answers. Student turns were very short, approximately five seconds, and initiating questions were very rare. Furthermore, at key stage four and above, teachers continued to control the interaction with considerable recitation and explanation and few initiations from students (Hardman and Mroz, 1999). This suggests the teacher's authoritative role and pedagogic goals may lead to high levels of questioning, restricting student initiation across academic levels. This was further corroborated by Walsh (2006) who identified that 'why' questions produced the longest responses from students but were also the type of question used least by teachers. In contrast to the findings of Hardman and Mroz (1999), teachers' use of 'why' questions was, however, suggested to increase with the students' age and academic level (Walsh, 2006).

The teachers' secondary role within the IRF framework is the provision of feedback following the students' response. Hardman (2008) suggested that the way in which the follow up move was employed within the IRF framework could determine the resulting student participation and engagement. However, Walsh (2006) proposed that teacher use of the feedback move could become ritualistic, with limited thought being given to the instant feedback provided. The majority of feedback within classroom discourse is often short, evaluative and not informative, for example, 'good' (Alexander, 2004). This traditional feedback suggests that the teacher expects a known answer from the students and does not encourage dialogic classroom interaction (Alexander, 2004). In relation to this, Nystrand, Gamoran, Kachur and Prendergast (1997) stated that when teachers focused on the evaluations they provided to student responses, they were more likely to use strategies to encourage further development of the student's answer, in contrast to the traditional minimal feedback response. For example, teachers used the students' answers in order to form another question. This type of 'high-level' evaluation was said to encourage further student-led ideas and discussion as students felt their responses had an influence on the discourse. As a result, teaching may become a more dialogic process, as advocated by Hardman (2008).

Whatever the pattern of discourse employed by the teacher, language is integral to the educational process. The way in which teachers use their own language to convey information is also known to be significant (Walsh, 2006). An earlier study by Chaudron (1988) identified four ways in which teachers altered

speech when interacting with their class: simplification of vocabulary and phrases, use of basic grammatical structures, reduction in the speed of speech and increased facial expression and gesture. The importance of speech within the classroom was recognised by Barnes (2008) who stated that in relation to the constructivist principles of learning, 'talk' is often the most straight forward way of understanding and taking in new knowledge. The constructivist theory suggests that learning occurs as we make sense of what happens in relation to the construction of our own world (Barnes, 2008). New ideas are learnt by relating these to our existing view of the world and working out how these may or may not fit together with our current understanding. This process of learning requires flexibility in the development of understanding through consistently challenging what we know and how it constructs our world. For this reason, Barnes (2008) identifies talking through new ideas with teachers and peers as the easiest format in which to do this. The constructivist theory, therefore, advocates an interactive teaching style within a social process (Barnes, 2008). Thus, within the teaching-learning pedagogy of constructivism there is a place for narrative, which can be employed in interaction as a means of assimilating information and constructing understanding (Barnes, 2008).

Children with communication difficulties may have a limited ability to use speech for constructing and demonstrating their own understanding of educational matter, affecting their construction of learning. This is viewed against an educational context where the tripart IRF/IRE sequence is in frequent use. It is possible that the teaching-learning pedagogies employed by teachers of children with communication difficulties may differ from those identified within a mainstream classroom and demonstrate adaptation to the child's presenting needs. The following section examines the interactions that occur between teachers and students within the SEND classroom.

#### **1.4.2 Within special education**

Limitations to participation in classroom interaction and communication present a number of difficulties for children with SEND. For example, recognised limitations in attention and responding are likely to make social participation within the classroom difficult (Berry, 2006). Modifications to teacher communication within the SEND classroom have been observed in multiple research studies.

Research by Berry (2006) observed multiple simplifications applied to language during teacher interactions with pupils with learning difficulties. Berry's (2006) observation of two inclusive, mainstream classrooms revealed teacher use of specific facilitation strategies, such as modelling the student's response back, error corrections and directing strategies, in which teachers ensured student attention and provided clear, simplified information and activity instructions. Teachers were also observed simplifying questions into choices in order to encourage participation of the students with learning difficulties (Berry, 2006).

Together with the increase in modifications to teacher language, use of the tripart IRF framework has been recognised in SEND classroom discourse. In a preliminary study of English lessons within two SEND classes, Bunning and Ellis (2010) found teachers made significantly more initiation and follow-up moves and students produced significantly more response moves during interaction. This suggests use of the Sinclair and Coulthard (1975) IRF framework of classroom discourse due to the significant difference in teacher initiation and feedback moves in contrast to AS responses. Teacher initiations were predominantly questions, although a high number of informative moves were also recorded (Bunning and Ellis, 2010). The questions used were thought to be influenced by the pedagogic goals of the teacher, as identified in studies of mainstream classroom discourse (Walsh, 2006). Teachers were found to address initiations primarily to the whole class before identifying a particular individual to provide a response (Bunning and Ellis, 2010). This again reflects the majority of mainstream learning-based interaction, which is predominantly whole-class centred (Baines, Rubie-Davies and Blatchford, 2009). However, it has also been suggested that SEND classrooms may support a higher level of dyadic learning opportunities, due to the presence of specialist support assistants (Stough and Palmer, 2003).

A proportion of students within the SEND classroom setting experience communication difficulties, resulting in the need for extra assistance in order to access the curriculum (Frederickson and Cline, 2002). This highlights the high level of versatility required by teaching staff to enable interactions in a class of pupils with a large variety of communication ability (Wright, Newton, Clarke, Donlan, Lister and Cherguit, 2006, Detheridge, 1997). Possible strategies range from simplifying language and speech to supporting the use of high-tech AAC systems (Higginbotham et al., 2007b). Barnes' (2008) theory of learning suggests

students learn through 'talk' and discussion of a subject to develop new understanding. For students with SEND, communication difficulties therefore introduce added complexity in participating in this learning process. Use of a wide range of communicative modalities is one approach to supporting access to teaching-learning for all students. Bunning and Ellis (2010) found that teachers and students used gesture and sign with similar frequency. A more recent study from Bunning, Smith, Kennedy & Greenham (2013) recorded significantly higher use of initiation and follow-up moves by teachers during classroom interaction with students with severe to profound and multiple intellectual difficulties. Teachers showed a tendency to use 'requestives' as initiations, i.e. question type moves. Despite their severely restricted communication skills, the students produced significantly more response moves than their teachers (Bunning et al., 2013). This provides further evidence of the IRF framework in use within the SEND classroom. Although teachers clearly controlled the classroom interactions, they also used scaffolding techniques. They adapted their use of communicative modalities to reflect those of the students in order to support their early communication skills (Bunning et al., 2013).

For students who use AAC devices, little research has been conducted on their experience of classroom discourse. However, the complex nature of aided speaker (AS) interaction means that the successful use of AAC depends on the conversation partner as much as the user (Murphy, Markova, Collins and Moodie, 1996). Within education, teaching staff are the most prominent conversation partners. To access the learning process described by Barnes (2008), students using AAC need similar opportunities to contribute to classroom discourse as their peers. Teacher-pupil interactions have been specifically identified as highly significant for the language development of children who use AAC (Smith, 1994, Millar, 2001). In a qualitative study of four teachers' views on student success with AAC usage, Smith (1994) found that AAC was identified as an important modality for communication within the classroom. Although, in the same study Smith (1994) observed that some teachers used restrictive interaction strategies allowing the children who use AAC minimal control, and imposing limitations on conversation style. This highlights the link between communication success and the interaction style used by the Natural Speaker (NS) when communicating with an individual who uses AAC. However, this is still a considerably under-researched field and further investigation of teacher NS and student AS

interaction is needed to establish the existing patterns of classroom interaction for these learners.

Teacher attitudes and their level of confidence in communicating with students who use AAC have also been recognised as factors in their interactions with AS students (Millar, 2001, Soto, 1997). In a survey of SEND teachers, Soto (1997) found that interacting with children who use AAC had a negative effect on some teacher's feelings of self-efficacy and confidence due to their limited training and experience with these type of students. Millar (2001) highlighted the importance of training for staff supporting children who use AAC to ensure they feel able to effectively support the interaction. A lack of confidence in interacting with a student who uses AAC may affect the teacher's willingness to attempt communication and reduce the resulting opportunities available for the student's social participation (Beukelman and Mirenda, 2005, Waller and O'Mara, 2003, Soto, Yu and Henneberry, 2007).

In summary, examination of teaching-learning pedagogies, particularly in relation to children with SEND suggests common use of a tripart IRF pattern of interaction. This reflects the classroom discourse of mainstream environments, although some additional teacher strategies have also been identified in order to support learners with SEND (Berry, 2006). Considering the important role teachers play in classroom discourse and the resulting learning process, it is surprising that teacher interaction styles with children who use AAC has been identified as a relatively neglected area of study (Ockjean and Hupp, 2007)

## **1.5 Research Aims**

The introduction to the AAC, 'technology', and educational contexts or 'milieu' of the current study has identified several areas for possible research. Technological developments within the field of AAC currently occur at a fast pace, at which rate it is not possible to form the research evidence-base supporting these advancements. Access to the National Curriculum of England, Wales and Northern Ireland and interactive learning for children who use AAC provides an important context for children of school age. In particular, the 'Speaking and Listening' goals within the National Curriculum and P Levels present a number of challenges for children with complex communication needs. Narrative is an

identified theme for many of the National Curriculum targets. The current study, therefore, aims to investigate the narrative interaction between young people who use electronic, aided communication and their natural speaking, teaching staff.

# Chapter Two

## Literature Review

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### 2.1 Introduction

This chapter provides both a broad search and a more structured review of the existing literature relating to AAC and narrative construction. Two types of search were completed due to the relatively small field of AAC interaction research. The first section focuses on the wider topic areas of language acquisition, patterns of interaction and narrative acquisition for both TD children and those with complex communication needs. The second section provides a structured review of the existing literature in the field of narrative production by children who use AAC. Details of the search strategy and exclusion criteria employed are given. The identified studies are then critiqued and gaps in the existing literature are discussed. The research questions for the current study are then introduced.

References were identified using structured review and keyword searching of the databases CINAHL, AMED, EMBASE, ERIC, Intute, BEI, MEDLINE and PsycINFO. These databases were searched separately from the date of inception (September 2008) to January 2012. The selection of these databases was made to ensure a comprehensive range of references was found in relation to allied health professions, medicine, psychology and education. To ensure research was current and remained relevant, a limit of 1980 was put on publication date. However, an exception to this was made for some seminal papers relating to theories of language acquisition, which were included to provide a theoretical context for language development. Journals including “Augmentative and Alternative Communication”, “Technology and Disability”, “International Journal of Language & Communication Disorders” and “British Journal of Special Education” were thoroughly reviewed independently to ensure keyword searching did not omit any relevant articles.



## **2.2 Language Acquisition**

### **2.2.1 Language Acquisition: TD Children**

A range of theories have been developed in order to capture language acquisition and development, all of which have made variable contributions to wider understanding of the subject. Before considering how language development is affected by communication impairment or the use of an AAC device, it is important to consider how language is expected to develop. The backdrop of language acquisition for the current study was informed by the main theories that have been developed to explain the process of communication development. The following section aims to highlight these main theories and identify the relevance of emergentism to those with physical and communication difficulties. This is necessary when reflecting on the influence and interaction between the individual with SEND and the developmental environment.

There are two major theoretical approaches to language acquisition within which a variety of proposals have been made. Language acquisition is generally theorised under the approaches of Universal Grammar or Usage/Input based (Ambridge and Lieven, 2011). A Universal Grammar approach assumes an innately specified general grammar that is applicable to all world languages. The theories of nativism are considered Universal Grammar approaches to language acquisition, assuming some innate ability as the foundation for development (Ambridge and Lieven, 2011). In contrast, usage or input-based theory, incorporating constructivist, sociopragmatic and emergentist approaches, identifies the environment and adult model a child receives as the principal factor in development. These approaches assume no innate knowledge of grammar (Ambridge and Lieven, 2011).

One of the earliest input-based theories of language acquisition is the Behaviourist theory. Behaviourists state that language is a form of learned behaviour, modified by the environment (Skinner, 1957) and identify language as no different from any other behaviour learnt by a child. Behaviourists acknowledge that some internal mechanisms, such as neurological processes, are central to language acquisition. However, they do not accept that this includes internal structures such as innate grammars (Bohannon III and Bonvillian, 2009). The

emphasis is on the environment, specifically the communication partner, suggesting language is learnt through modelling by a parent, imitation from the child, practice and reinforcement. This theory does however have several limitations. For example, it cannot account for developmental processes such as over-generalisation of grammar. Behaviourist theory also cannot explain how deaf babies, despite hearing no sound, babble during the first year of life. These limitations led to the emergence of theories that also incorporate an element of development that depends on the individual.

The nativist theory, for example, proposes that the ability to acquire language is innate, and suggests the general structure and process of language acquisition is universal across native languages (Allen and Seidenberg, 1999). Chomsky introduced the idea of an innate device – the Language Acquisition Device, which was said to provide the universal phrase structure rules of language (Chomsky, 1957). Transformational rules, which are the rules that define the non universal aspects of any language such as the form of negatives or questions, are then learnt through linguistic input. However, this theory fails to recognise the importance of environmental and cognitive development on language acquisition. The main rules regarding phrase structure and transformational rules are also based on completely developed adult language, which cannot fully explain some child language processes.

Sociolinguistic theory focuses on the underlying communicative function of language as opposed to structure or form (Owens, 2008). It develops the Behaviourist model further by providing a transactional model of language development, whereby the child learns the rules of dialogue through interaction with a parent. Mothers interpret a child's earliest behaviours as meaningful, which gives the child confirmation of their communication attempts from the very earliest stages of development (Bruner, 1975). As language develops, the child produces first utterances, which are purely functional. As these utterances develop, the parent alters their own speech, which in turn continues the child's development. However, this theory still does not entirely acknowledge any innate ability within the child, again failing to explain a deaf baby's ability to babble.

Constructivist theory assumes no innate knowledge of grammar. The characteristics of the adult or environmental input received by the child are the

predominant factors in the child's language acquisition. Constructivists argue that as opposed to developing through innate knowledge of a series of learnt formal rules, a child uses analogies of previously experienced language or words to construct the grammar required (Ambridge and Lieven, 2011). The processes required for sentence formation are therefore developed through a child's generalisation. These proposals formed from child generalisation as part of language acquisition may be termed emergentist proposals (Ambridge and Lieven, 2011).

Emergentism is one of the most recent theories of language acquisition and pulls together the prominent factors from past theories to explain the process of language development. Emergentism replaces ideas of rule learning and cognitive structures with the suggestion that language emerges from the interaction of cognitive processes (Allen and Seidenberg, 1999). It is also now believed that a form of innate structure within the brain is necessary for a child to develop language. However, this is not thought to be a Language Acquisition Device as suggested by Chomsky (1957), but the structure of the brain that affects the way in which information is processed. Emergentism also supports the idea that the language input received by a child from their developmental environment is the foundation for their cognitive processing, which in turn facilitates the acquisition of language. This is now a widely accepted model, acknowledging language is acquired through an innate process supported by the input of the linguistic environment.

Review of the main theories highlights the complexity of language acquisition and the role of both the individual and their environment. When a developmental disorder or social difficulties are also introduced as a factor, the development of language may be disrupted. This leads to a highly complicated process when we consider children with complex communication needs associated with a developmental condition. The following section examines the existing literature regarding how a developmental disability can affect the process of language acquisition.

### **2.2.2 Language Acquisition: Children with Developmental Disorders**

This section discusses the communication difficulties associated with two developmental disorders: cerebral palsy (CP) and Autistic Spectrum Conditions (ASC). These conditions are central to the review as they are directly relevant to the sample in the current study. Due to the cognitive demands of the research task, narrative production, it was expected that a primarily motor condition such as CP would form the 'typical user' of this study.

CP is a chronic disorder of movement and posture due to non-progressive pathological processes of the developing brain (Aicardi and Bax, 1992). Within Western countries, current prevalence data suggests that CP affects between 2 and 2.5 births per 1000 (Scherzer, 2000). Approximately 60% of these children are likely to experience co-occurring communication difficulties (Murray and Goldbart, 2009a). As a predominantly motor condition, CP often limits the production of intelligible speech and recognisable gesture or facial expression (Pennington, 2008). In a review of CP and communication, Pennington (2008) identified dysarthria as a common co-morbid condition in children with CP due to the co-ordination of respiration, phonation and nasality required in speech production. The limited ability to use gesture may also influence language development, as early intentional communication such as reaching for a desired object is likely to be affected. Presence of physical disability also restricts activities, such as exploring the environment through play and joint attention, both recognised precursors to speech and language (Sutton, Soto and Blockberger, 2002, Pennington, 2008). A child's physical exploration of the environment through reaching, grabbing and moving towards desired objects is a form of non-verbal communication during pre-verbal development. This in turn generates interaction with a caregiver, as they react by providing a verbal response to the TD child's actions. If a child's ability to explore the physical environment is limited, this may therefore lead to decreased linguistic input from caregivers, as their opportunity to communicate through grabbing and manipulation of objects is restricted.

The interactions of children with CP are affected by the environment, in particular the role played by significant people in the child's life. Nearly thirty years ago, Light, Collier and Parnes published a seminal series of three papers

(1985a, b & c). These drew attention to the interactions of children with CP and their primary caregivers. Eight children with congenital physical disability were videotaped in twenty-minute play interactions with primary caregivers. In the first paper from this research Light et al (1985a) identified that primary caregivers took more than twice the communicative turns than their children. Caregivers saw silence as a breakdown in communication and would often fill pauses that lasted any longer than one to two seconds. Primary caregivers often took control of the interactions creating an asymmetry between interlocutors. Communication was found to be transactional, with both conversation partners being influenced by the information and input conveyed by the other person (Light et al., 1985a). The transactional nature of the interaction highlighted the importance of the communication partner, influencing the ongoing communication of the AS. The dominant role of caregivers observed may further restrict language acquisition and development for children with CP, as they were limited in their opportunity to initiate and control interaction.

The second paper from the Light, Collier and Parnes (1985b) study examined the communicative function of turns taken. The child participants' recorded turns were principally confirmations or denials demonstrating the tendency of parent-child interaction with non-speaking children to follow a question-answer format. Primary caregivers took the role of repairing any breakdowns that occurred during the interaction (Light et al., 1985b). The question-answer format provides little opportunity for the individual who uses AAC to develop more complex linguistic structures and grammar. By predominantly producing confirmations or denials, aided communicators fall into a more passive respondent role in the interaction.

Light, Collier and Parnes (1985c) also examined the communicative modalities employed within the interactions. All children were found to employ multiple communicative modalities, including vocalisation, eye gaze, gesture and use of a communication board. This may have produced more time efficient communication for the aided speaker, especially when confirmations and denials were the main response types recorded. Light et al (1985c) stated that developing communication for non-speaking children involves learning to function competently in an environment dominated by spoken language. This is another constraint on the development of language for individuals with CP. This research

has been highly influential within the field, and the methods of data collection, measurement and analysis used were shown to be reliable with good consideration of potential confounders. The research environment was well managed with all data collected in a familiar setting. All participants were used to being videotaped, limiting the possibility of reactivity to the cameras.

Pennington and McConachie (1999) extended this area of research by investigating the interactions of twenty mother-child pairs with the child having CP affecting all four limbs. During ten minute play interactions the mother was found to take a directive and more dominant role. The interaction was characterised by maternal initiation and child response, placing the child in a more passive role than the mother. This is in direct contrast to that of typically developing children who are known to become more equal partners in communication from an early age (Pennington and McConachie, 1999). These findings were later corroborated in a similar study of forty mother-child pairings, during which over half of the mothers' interactional turns were initiations (Pennington and McConachie, 2001).

The studies discussed above highlight the asymmetrical nature of interaction between children with CP and their parents. The linguistic environment is therefore different for a child with CP to that of the TD child. The child with CP has reduced opportunity to initiate and therefore receive feedback from the caregiver, essential in the acquisition of language. In Emergentist theory it is acknowledged that the linguistic environment impacts directly on both language acquisition and resulting language development. The interaction style of caregivers towards children with CP is therefore likely to impact significantly on their language acquisition. The directive and initiating role of the primary caregivers may also limit the opportunity for children with CP to develop more complex linguistic structures (Light et al., 1985b).

The observed limitations to opportunity and developmental stimuli experienced by children with CP are highly significant as many have verbal cognition within the normal range (Sigurdardottir and Vik, 2011). In a study of 152 Icelandic children aged four to six years with congenital CP, Sigurdardottir and Vik (2011) found almost half of participants had verbal cognition within the normal range. A quarter of the group classified with severe dysarthria had normal cognition. This demonstrated that physical disability affecting speech must not be

mistaken as cognitive impairment (Sigurdardottir and Vik, 2011). In this study, 21 of the participants were using AAC as a means of communication due to motor speech difficulties related to their CP. AAC is an important tool in the provision of communication output for children who have the cognitive ability to participate in interaction but are physically restricted in doing so.

Two participants in the current study were known to have CP. The two remaining participants had autistic type conditions. Children with Autism have been shown to experience language acquisition differently to typically developing children. According to the World Health Organisation Classification of Diseases, childhood autism is defined as: a pervasive developmental disorder that presents with abnormal functioning in the three areas of reciprocal social interaction, communication and stereotyped, repetitive behaviour (World Health Organisation, 2010). The communication difficulties associated with Autistic Spectrum Conditions (ASC) have been characterised by poor eye contact, lack of response to other people's voices or attempts at interaction and extremes of temperament (Mitchell, Brian, Zwaigenbaum, Roberts, Szatmari, Smith and Bryson, 2006).

Mitchell et al (2006) identified delays in language development from as early as twelve months in children later diagnosed with ASC. Findings indicated that children with ASC produced fewer symbolic gestures than TD controls. However, no significant differences were shown in vocabulary production or comprehension at this age. By 18 months children with ASC produced and understood fewer words than the control group (Mitchell et al., 2006). This paper can only be prospective as children were diagnosed and completed this part of the study at 24 months. At this age, diagnosis is not entirely stable and so later follow up information to identify any misclassification is needed to confirm the reliability of the findings.

There is relatively little research regarding the parent-child interactions experienced by children with ASC, although this is the focus of a number of interventions (El-Ghoroury and Romanczyk, 1999). An early study by Wolchik (1983) compared the language patterns during twenty minute interactions between ten parents with children with ASC and ten parents with ten TD children. It was found that the parents of children with ASC used slightly more questions and labels than the parents of TD children at a pre-school age. However, across

all other measures, no significant differences were found between the interaction styles of the two parent groups. This suggested that children with ASC experienced a similar language environment to their TD peers in relation to parent-child interaction (Wolchik, 1983). A secondary finding from the study indicated differences between the interactions of mothers and fathers of children with ASC. Mothers tended to employ more directives, labels and information-seeking questions. In contrast, fathers paid more attention to the child's communicative attempts and responded to more non-verbal activities. Wolchik (1983) suggested that mothers and fathers may therefore play different roles in interaction with a child with ASC. Whilst the research is about thirty years old and parental roles may have changed considerably in the last two decades, it is included here due to limited recent research on parent interaction with children with ASC.

Just over sixteen years later, a study by El-Ghoroury and Romanczyk (1999) identified notable differences in the interactions between siblings-children with ASC and parents-children with ASC. Parents produced a higher number of play interactions with the children with ASC than their siblings. Conversely, the children with ASC made more verbal initiations during interactions with their siblings. The authors argue this may indicate a potential restriction on the initiations of the child with ASC due to the large amount of parental play input (El-Ghoroury and Romanczyk, 1999). The generalisation of these findings is affected by the small sample size. However, the study highlights a potential dominant parental role, which reflects existing research on the interactions of parents with children with disabilities. As for children with CP, this may restrict the linguistic environment experienced by children with ASC and therefore resulting language acquisition and development.

Some differences in parent-child interaction within the research fields of CP and ASC have been highlighted. Despite their aetiological differences, the use of AAC has been indicated as beneficial for some children with both diagnoses (Murray and Goldbart, 2009a). However, the use of an AAC device is also known to have an impact on the acquisition of language. This is discussed in the following section.



### **2.2.3 Language Acquisition: Children who use AAC**

Communication for children who use AAC is a complex proposition compared with their TD peers (Light, 1997). In a review of the literature, Sutton et al (2002) identified a range of factors influencing language acquisition for children who use AAC. Limitations may be present in activities that are known precursors to speech, such as exploring the environment through play and joint attention due to physical disability (Sutton et al., 2002). Parental modelling and child imitation is a common pattern for supporting language acquisition. However, a child for whom speech is not the primary communicative modality does not have an adult model to mimic and observe (Sutton et al., 2002). The asymmetry between the natural speaking carer and child using AAC also affects the error correction process that occurs during language development. A parent is most likely to correct a child who uses AAC via speech rather than demonstrating the correction using their AAC device (Sutton et al., 2002). These limitations lead to an increased number of cognitive processes required for language acquisition. This was also recognised by Smith (2003), who identified the increase of maternal directiveness and low semantic contingency between maternal and child utterances as two salient limiting factors in AS language acquisition. These are factors found to lead to slower language acquisition in TD children by Conti-Ramsden (1994).

The type of AAC device used will also have a significant impact on a child's language acquisition, as highlighted by Scherer (1993) as one of three salient features within the MPT model. The communication device's software, with its ready-selected vocabulary, requires programming by another person, bringing a new set of constraints. The individual's expression of ideas, reporting of experiences and on-going lexical development is dependent on the vocabulary updates instigated by another (Murray and Goldbart, 2009a). The external lexicon available therefore dictates how that child may participate in every day interaction (Light, 1997). In a review of the issues surrounding the context of language acquisition for children who use AAC, Light (1997) highlighted the importance of providing and maintaining a relevant and meaningful vocabulary. Pre-literate children reliant on AAC, currently have minimal control over their vocabulary acquisition (Light, 1997). In stark contrast, TD children capture and acquire the vocabulary that is most salient and interesting to them from the language model provided in their surroundings.

During focus groups, adolescents and adults who use AAC and their caregivers identified the provision and organisation of vocabulary as an area still requiring further research and improvement (O'Keefe, Kozak and Schuller, 2007). The importance of relevant vocabulary was corroborated by Murphy et al (1996) who collected questionnaire data from ninety-three adolescents and adults who use AAC and one hundred and eighty-six caregivers. The findings of this study indicated that despite good AAC provision, if vocabulary was either absent or irrelevant, the user showed reluctance to use the device (Murphy et al., 1996). Although the sample comprised older individuals who use AAC and facilitators, this still suggests that vocabulary must be relevant to encourage the use of a device and increase language development opportunities for children who use AAC.

Communicative competence is the aim for all typically developing children in order to participate in functional interaction. For users of AAC, communicative competence was defined by Light (1989) as:

“the quality or state of being functionally adequate in daily communication, or of having sufficient knowledge, judgement, and skill to communicate.” (p. 138)

Communicative competence of those who use AAC is an interpersonal construct that changes constantly in relation to four inter-related areas; linguistic, operational, social and strategic (Light, 1989). Linguistic competence refers to the understanding and mastery of the linguistic code. However, children who use AAC must develop an understanding of both the linguistic code of the native language and that required in the use of the AAC system. Linguistic competence therefore includes learning of the symbol system in use and developing an understanding of how to convey meaning through a restricted vocabulary. This highlights additional features of the language acquisition and development for children who use AAC in contrast to their TD peers. The pragmatic aspects of language and interaction were also identified by Light (1989) as salient factors in communicative competence for users of AAC; for example, the skills and knowledge to initiate conversation, respond appropriately, turn-taking and select topics of conversation. Sociolinguistic aspects of communication may be considerably affected by the

AAC device, impacting on the AS' ability to respond or initiate at the correct point in fast paced conversation. The complexities of interaction using an AAC device may lead to AS development of strategic competence; the development of compensatory strategies in order to convey the communicative message despite limitations of the device or vocabulary. This may include, the use of keywords and limited grammatical content to increase speed of interaction. Further to this, people who use AAC must gain 'operational competency', learning how to operate the AAC device in order to access the linguistic code as well as operate device features such as turning on/off or changing the volume (Light, 1989). Light (1989) suggests that an individual who uses AAC must integrate skills, knowledge and judgment in all four of the identified competencies in order to achieve functional communicative competency. One example of the interrelationships of these four areas is evidenced in the impact of reduced speed in AS:NS interaction. Slow interaction, due to aspects of operational competency, affects social competency by limiting the initiation and turn taking opportunities of the AS, and results in the need for strategic competency to adapt the message to increase efficiency. Additionally, linguistic competency is required at all points to de-code the message from the NS and respond, ensuring any strategies employed to increase efficiency do not alter the meaning of the message.

Slow speed of interaction was also identified as a limitation in a review of the issues affecting successful AAC use by Murray & Goldbart (2009a). Higginbotham et al Higginbotham, Kim and Scally (2007a) investigated the rate of communication production between two unimpaired participants, one using an AAC device and the other using speech to communicate during barrier task interactions. A rate of five to fifteen words per minute was recorded for the participant using the AAC device. This is considerably slower than natural speech in which 150 to 160 words per minute is considered a comfortable rate of speech (Williams, 1998). Due to the use of unimpaired participants, the Higginbotham et al (2007a) study cannot be used to indicate reliably the rate of AAC device productions in AS:NS interaction. It is however widely acknowledged that voice output from an AAC device is slower than natural speech production (Murray and Goldbart, 2009a).

One cause for the slow speed of aided communication is the complex process required to produce output from the AAC device. In contrast to the natural

communicator, a person who uses AAC has to manage the device's encoding and processing demands in order to contribute to an interaction. For example, an individual who uses AAC has to understand spoken language, recognise how this is represented on their device and recall where the relevant vocabulary is located, comprehending real-time interaction, whilst also planning and forming a response (Murray and Goldbart, 2009a). This increased cognitive load in producing communicative output is also likely to act as a further stress on the language development of children who use AAC.

In the context of the physical and technological limitations imposed on language acquisition, children who use AAC tend to show deficits in the use of morphology and syntax. Blockberger and Johnston (2003) compared the morphological understanding and expression of three participant groups: TD children, children with language delay and children with complex communication needs using AAC. Following the completion of three research tasks it was found that children who used AAC devices were less able to master plural, possessive and past tense markers than their TD peers. Children who use AAC also performed worse on grammatical morpheme tasks than the participant group known to have language delay. During the early stages of AAC usage, children often do not have access to grammatical markers, which results in limited experience in their use (Blockberger and Johnston, 2003).

Attempts to increase speed and efficiency of communication often take precedence over grammatical precision for individuals who use AAC. This again limits experience and development of grammatical structures (Blockberger and Sutton, 2003). The extended process of access and output on an AAC device slows the aided communicators' participation in interaction. For this reason, prepositions and other grammatical markers are frequently omitted in order to reduce the number of device access moves needed to produce a communicative turn (Beukelman and Mirenda, 2005). Aided speakers are also known to use multi-modal communication as a strategy to communicate with optimum efficiency. This was first highlighted in Light et al's (1985c) study of interaction between children who use AAC and primary caregivers. The children produced on average 81.8% of communicative acts by means other than their communication boards. Light et al (1985c) suggested this may be influenced by the modalities used by the natural speaker and the function of the communicative move being

made. This was supported by Harris (1982) who suggested non-verbal children were most likely to initiate using gesture or vocalisation in order to gain attention.

AAC systems were also used infrequently in Pennington and McConachie's study of twenty mother-child play interactions (Pennington and McConachie, 1999). Only three children made use of their AAC systems during the recorded conversations. AAC systems were primarily used to produce responses, although two children also produced some initiations. The majority of acts were made using vocalisations (21.4%) or gesture (31.0%) and initiations were predominantly produced via these modalities. These findings were corroborated by Clarke and Kirton (2003) who identified the use of multi-modal communication in interactions between children who use AAC and their peers. Their findings revealed a dominance of 'natural' communicative modalities, specifically gesture, which was used for 46.4% of communicative acts and vocalisation used for 35%. Communication aids were used infrequently during peer interactions. These findings emphasise the multi-modal nature of communication for individuals who use AAC. Device use was found to be infrequent in contrast to other modalities employed. However, in all of these studies considerable variation is seen between participants. This highlights the heterogeneity of the aided speaker population and the varying complexity of communicative interaction for each individual.

The language acquisition of children who use AAC is therefore considered a complex process, affected by various technical and physical factors, leading to deficits in the areas of morphology and syntax. The communication environment, the roles of communication partners and the interactions experienced by children who use AAC are also known to differ from those of TD children.

#### **2.2.4 Aided Speaker Interaction**

Individuals who use AAC tend to take a passive role in interaction often acting as a respondent to questions posed by the natural speaker (Light et al., 1985a). Light et al's (1985a) seminal study found natural speaking carers took almost twice as many communicative turns as their children using AAC. Alongside this, only half of the communicative opportunities provided were taken up by the children using AAC. This meant primary caregivers took a controlling role in the interaction to repair and cover the missing turns that should have been made by

the child (Light et al., 1985a). The asymmetry of interaction between aided speaker and natural speaker resulted in the children not contributing to the interaction according to individual capacity (Light et al., 1985a). These findings were corroborated by the Pennington and McConachie (1999) study of mother-child interaction which found natural speaking mothers dominated conversation and initiated topics. During these interactions, mothers used a high number of questions and commands, which resulted in the children who use AAC limiting their communication to the required responses (Pennington and McConachie, 1999). Despite their control during the majority of recorded interactions, mothers also employed some strategies to encourage the children to initiate. For example, relevant responses were provided by the natural speakers on 80% of occasions when the children did initiate.

The interactional pattern of natural speaker initiation and aided speaker response has also been examined in interactions between aided speakers (AS) and their natural speaking (NS) peers. In a study of twelve AS:NS social interactions, Clarke and Kirton (2003) found the children using AAC made significantly fewer initiations and significantly more responses than their peers. NS partners also made significantly more follow-up moves. This demonstrated a similar level of control taken by the NS without the influence of any pre-requisite adult-child interactional roles. Despite inequality in initiations made, children using AAC and their peers used a more equal turn-taking distribution than shown in past research of adult NS to child AS interaction. It is suggested that this reflects the more informal nature of peer interaction, as adult-child interactions are frequently directed towards a specific communicative goal (Clarke and Kirton, 2003).

The idea of a specific goal in interaction is particularly true within an educational environment. Past research has shown that children with complex communication needs often use their devices more with educational staff than their family (Pennington and McConachie, 1999). Research investigating the interactions between teachers and pupils with learning difficulties has shown teacher moves to be characterised by modelling, overlapping, directing strategies and simplification of questions into choices (Berry, 2006). Whether these findings could be generalised to teacher and AS interaction is unknown as this area is currently under-researched.

Research within the educational environment has demonstrated some positive implications of AAC device use for children with complex communication needs. During the Communication Aids Project (CAP) Wright et al (2006) found that the provision of AAC in an educational context enabled some children to become more confident and hold a less passive role in interactions. Interviews with teaching staff identified participants becoming more actively involved in discussion following the introduction of a communication aid. These interviews took place before provision of a device and six to twelve weeks after a child had received the system. It is suggested that initial enthusiasm for the device could be responsible for some of the positive response. A follow-up interview after a longer period of time would enable the reader greater confidence in the reliability of the findings.

The positive influence of educational context on AS:NS interaction was also recorded by Jolleff et al (1992). Two separate semi-structured interactions between an AS child and their teacher and then a parent were video recorded. Interactions were transcribed and coded for interaction style, the child's communicative modalities and purpose of communicative acts. Although this study focused primarily on the child's communicative acts, it was noted that the teacher tended to use more open questions and request more complex information than the parent (Jolleff et al., 1992). This led to the child producing more detailed contributions to the interaction when communicating with their teacher. Communication devices were also used more frequently with the teacher than during interaction with the parents. Despite only limited data, this paper suggested that teachers were able to employ scaffolding strategies to encourage more complex language from children using AAC. The teacher-pupil dyad may therefore be one in which interaction style encourages language acquisition for children who use AAC. Further study within this field is necessary to establish the precise roles of the teacher and parent in NS:AS interaction in order to identify differences that may have a positive impact in the AS' communication.

In summary, research has shown that children who use AAC tend to take a passive role within interaction, which may further limit opportunities for language acquisition. Different environments may also affect AS:NS interaction. Parent-child interaction showed the highest level of NS dominance. Educational interactions have been found to provide potentially more positive conditions for AS

involvement in interaction. However, research has tended to focus solely on the contributions of the AS or factors determining the successful implementation of AAC. Teachers are known to play an important role in language development, yet the interaction styles of NS teachers with AS pupils are relatively under-researched.

The language acquisition and interaction of individuals with complex communication needs and AAC devices clearly differ from their TD peers. The role of educational staff in interaction with children who use AAC has been identified as an area requiring further research. All existing research discussed in this section has focused on conversational or play based interaction. More specific, language rich contexts, such as narrative interactions have been the centre of very few existing studies. Narrative as a context and its acquisition in both TD and children with complex communication needs is therefore explored in the following section.

## **2.3 Narrative**

### **2.3.1 What is narrative?**

Different authors have provided numerous definitions for 'narrative' and 'narrative language'. Some salient features that characterise narrative appear in almost all definitions: a 'high-point' or climax, personal experience, a sequence of events, emotion or feelings, extended language or increased length of linguistic moves. For example, Ninio and Snow (1996) describe narrative as extended discourse which includes two different events linked by a causal, temporal, elaborative or other relationship.

There are two principal types of narrative: personal and fictional. It is generally agreed that personal narrative involves the recounting of real past experiences or events pertinent to the individual (McCabe, Bliss, Barra and Bennett, 2008, Goldman, 2008). In contrast, fictional narrative is based upon fictional or imagined events that revolve around animate beings aiming to carry out a goal (Hughes, McGillivray and Schmidek, 1997). Fictional narrative may be made up by the individual or re-called from memory of a narrative they have been told previously. According to Grove (2005) the two types of narrative also have varying characteristics. Personal narrative tends to be more descriptive and



contain a larger number of single complete episodes. Fictional narrative consists of more multiple, incomplete episodes and action sequences. Both narrative types are told in the past tense.

Narrative production involves the combined employment of numerous language skills. It may involve: the organisation of content into temporal sequences, accurate recall of a particular event, formulation of complete utterances, introduction and correct reference to characters and adaptation of the narrative to accommodate the listeners' prior knowledge (Hughes et al., 1997). Due to the multitude of processes involved in its' construction, narrative development is a complex procedure. The following sections will provide detail of the developmental process of narrative in TD children and those with complex communication needs.

### **2.3.2 Narrative Acquisition: TD Children**

Narrative development is considered to emerge from early, more basic forms of discourse such as conversation and play interactions (Uccelli, Hemphill, Pan and Snow, 1999). Children understand the concept of event sequences from an early age due to the regular patterns of routine they experience. For example, at bath time, getting undressed is always at the beginning and getting dry is always at the end. During early narrative acquisition, narrative language is scaffolded by parents and caregivers. TD children may provide one word to comment on an event which is then expanded into a phrase by an adult (Grove, 2005).

From approximately two years old the pattern of narrative acquisition in TD children is widely acknowledged as following six levels, first documented by Applebee (1978). Applebee (1978) charted the narrative development of children from approximately two years to adolescence. This led to the formation of Applebee's (1978) six levels of narrative development. At the first level termed 'heaps', children are able to provide narrative information, but this lacks any structure and has limited sequential detail. Information is provided in the order of immediate perception by the child (Hughes et al., 1997). At the secondary 'sequences' stage, children begin to include some superficial sequencing to their narrative information. However, causal links between events are still omitted. At

approximately 2.5-3 years TD children produce 'primitive narratives'. These are characterised by a core, based on practical experience alongside complementary attributes, which are used to augment the narrative. The fourth level is termed 'unfocused chains'. Sequential chains of events are narrated by the child, but linking attributes lose focus and topic shift occurs causing the narrative to drift. This level of narrative is described as being relatively rare, and does not occur in all children's narrative development.

By five years old, 80% of TD children studied by Applebee (1978) were able to produce 'focused chains'. These stories centre on a principal character that experiences a sequentially chained series of events. However, any abstract concepts or reflection of more complex emotional links to events are still missing. The final level of narrative acquisition is the production of 'true narrative'. 'True narratives' incorporate themes and morals and are held together by both abstract and concrete causal, temporal and sequential attributes. The 'true narrative' level is normally attained at approximately seven years old (Hughes et al., 1997). At this stage children are able to produce good narrative structure, but development continues into adolescence. With age, the number of complete episodes within the narrative increases (Grove, 2005).

Narrative development as described by Applebee (1978) is a complex process that extends from scaffolded single word comments to 'true narratives'. How narrative development is affected by the presence of communication impairment requires consideration. The following section, therefore, examines the impact of complex communication needs on a child's narrative development and experience of narrative interaction.

### **2.3.3 Narrative Acquisition: Children with Complex Communication Needs**

In contrast to TD children who progress from scaffolded, single word to narrative input fairly quickly, children with complex communication needs may take considerably longer to progress through Applebee's (1978) levels of narrative. As a result, they may also remain at a level before 'true narrative'. This is due to the developmental limitations imposed upon the child with complex communication needs and their resulting experience of language. These

limitations can be divided into the categories of the MPT framework introduced in Chapter One (p.16), i.e. milieu or context, person and technology.

Narrative is important for developing cross-context communication skills, due to the multiple language abilities it incorporates, which are required in educational and social environments (Soto et al., 2007). The milieu of narrative development is predominantly affected by the NS conversation partner. It has been suggested that children who use AAC rely heavily on conversation partners in the construction of narrative interaction (Soto et al., 2007). Children who use AAC are given a high level of scaffolding during conversational interaction. This may also occur during narrative interaction; however this is currently an area requiring further research. The scaffolding provided by the NS is likely to be given using speech, leaving the AS with a model of narrative that may be beyond their capacity to copy directly. Frequent scaffolding from conversation partners through the use of closed questions may also restrict opportunities for children with complex communication needs to input narrative features such as 'story grammar' and grammatical markers (Soto et al., 2007).

A number of authors have reported that children who use AAC have limited opportunity to participate in narrative construction (Soto et al., 2006, Light, 1997), which is likely to reduce the rate at which they develop narrative skills. The narratives that children with complex communication needs are most likely to experience are more formal, NS dominated storytelling interaction as opposed to fictional or personal narrative construction (Ukrainetz, Justice, Kaderavek, Eisenberg, Gillam and Harm, 2005). Von Tetzchner and Martinsen (2000) state this formal type of narrative experience is likely to further restrict the advancement of language skills for individuals who use AAC. Alongside the milieu, the technology in place will also significantly affect the narrative development of a child who uses AAC.

The technological limitations experienced by children who use AAC during language acquisition (p.36) are also likely to have an impact on their development of narrative language. The substantial number of linguistic and descriptive structures employed in narrative may not all be available on an AAC system (Smith, 2006a). If these linguistic structures are available, they are still likely to be omitted by the person using AAC in favour of efficiency and speed of interaction

(Smith, 2006a). The pre-programmed nature of AAC vocabulary restricts the development of the AS at almost all of Applebee's (1978) levels of narrative. Spontaneous vocabulary relating to specific personal experiences is unlikely to be on the device. The prolonged turns that are characteristic of narrative would also require significant time for the AS to encode. This in turn increases the already extensive delays and slow speed of AS:NS interaction (Murray and Goldbart, 2009a).

Restrictions within the 'milieu' and 'technology' available to the aided speaker may account for the characteristics of AS narrative identified by Soto et al. (2006). Narratives were found to be short with few complete episodes. They included numerous single word utterances, with little cohesion between narrative input leading to high levels of communication breakdown (Soto et al., 2006). This reflects some of the characteristics of AAC conversational interaction recognised in section 2.2.4 (p.41). The literature has demonstrated a link between 'milieu', 'technology' and the resulting 'person' characteristics, such as difficulties in narrative production. The Soto et al. (2006) single case study was one paper identified during structured searching and review of the literature. A more detailed critique and discussion of the findings, alongside other literature within the field of narrative and AAC use is presented in the following section.

## **2.4 Structured Literature Review**

### **2.4.1 Search Protocol and Procedure**

As the field of AAC and narrative language is the primary focus of this study, a structured search was used to identify existing literature within this field. This section of the literature review discusses papers found using a structured literature search strategy with a combination of the following search terms: "AAC" or "augmentative and alternative communication" or "communication aid" or "augmentative communication" or "VOCA" or "voice output communication aid" or "computer speech device" or "aided communication" or "speech generating device" or "communication aid for the disabled" AND "storytelling" or "story(-)telling" or "narrative" or "education" or "teach\$ interaction" or "teach\$ communication" or "teach\$ pupil interaction" or "teach\$ pupil dialogue"

<b>Database</b>	<b>Limits</b>	<b>Abstract Appraisal</b>	<b>Full Text Appraisal</b>	<b>Inclusion in Review</b>
CINAHL	English language, Peer-reviewed journals only, Paediatric	17	14	9
AMED		0	0	0
EMBASE	English language, Paediatric	3	0	0
MEDLINE	English language, Paediatric	1	0	0
PsycINFO	English Language, Paediatric	4	2	2
ERIC		16	8	8
BEI		7	2	1
Intute	Peer-reviewed journals only	2	0	0

Table 2.4.1a Database search outcomes, inception to January 2012

After searching and excluding papers at the level of abstract appraisal, fourteen articles were chosen for full text appraisal. Eight of these articles were duplicated across more than one database and the duplicates discarded. Reasons for the exclusion of papers from each database are provided in Table 2.4.1b. One paper was excluded due to a lack of access. Contact was made with the author, who stated that this paper was a review of two other papers that had already been included and it was therefore an unnecessary addition as it would be difficult to obtain a copy. The choice to exclude papers that focused on adults who use AAC, was made due to the focus of the current study on an educational context as well as the developmental use of narrative language. The inclusion of papers centred on adults who use AAC would have provided too broad a context to the literature. By excluding these papers it was possible to further refine the focus and resulting research questions of the current thesis. Papers that had a methodological, bio-medical or legislation bias, or were not focused on the interaction, language use or narrative produced by an individual who uses AAC were excluded under the criteria 'not primary research'. This ensured that the literature reviewed was the most relevant to inform the current study.

Reason for exclusion after abstract appraisal	Number of citations excluded								
	CINAHL	AMED	EMBASE	MED LINE	Psyc INFO	ERIC	BEI	Intute	
Not primary research	4	-	2	-	1	5	5	2	
Focus on adults	2	-	1	1	1	-	-	-	
Focus not on narrative language	-	-	-	-	-	1	-	-	
Not peer reviewed	1	-	-	-	-	1	-	-	
No Access	-	-	-	-	-	1	1	-	

Table 2.4.1b Rationale for citation exclusions following abstract appraisal

Nine papers were found for inclusion in the literature review. Critical Appraisal Skills Programme (CASP) guidelines were used as a framework for the appraisal of the nine articles selected. The use of these guidelines ensured that all papers were scrutinised to the same level and on the same terms. As a result, the findings of this literature review were well placed in informing the development of the research questions and ensuring the relevance and originality of the research. The small number of articles returned by the search strategy reflects the current limit of research in the field of AAC and the fact that this research field is in its infancy.

## 2.4.2 Critical Appraisal of Papers

An overview and critique of the nine papers is provided on the next page. Existing gaps in the field of AAC and narrative interaction are discussed. Consequently, the research questions for the current study are presented. Table 2.4.2a on the next page, provides a summary of the nine papers included in the literature review following the exclusion procedure detailed above.

<b>Author (Date)</b>	<b>Title</b>	<b>Type of Study</b>	<b>Participants</b>
Soto, G. & Hartmann, E. (2006)	Analysis of narratives produced by four children who use augmentative and alternative communication	Descriptive study of narrative productions created by children who use AAC	n=4 (4 dyads)
Soto, G. Yu, B. & Kelso, J. (2008)	Effectiveness of Multifaceted Narrative Intervention on the Stories Told by a 12-Year-Old Girl who uses AAC	Intervention study - investigating the effectiveness of an intervention programme on narrative production of a child who uses AAC	n=1
Liboiron, N. & Soto, G. (2006)	Shared storybook reading with a student who uses alternative and augmentative communication: A description of scaffolding practices	Description of scaffolding strategies used by Speech and Language Therapist (SLT) in narrative interaction	n=1 (1 dyad)
Soto, G. Hartmann, E. & Wilkins, D. (2006)	Exploring the Elements of Narrative that Emerge in the Interactions between an 8-Year-Old Child who uses an AAC Device and her Teacher	Investigation of narrative assessment process for individuals who use AAC and scaffolding strategies used by a teacher during narrative interaction	n=1
Soto, G. Solomon-Rice, P. & Caputo, M. (2009)	Enhancing the personal narrative skills of elementary school-aged students who use AAC: The effectiveness of personal narrative intervention	Intervention study - intervention programme focusing on the improvement of linguistic complexity, story complexity and organisation of personal narrative	n=3
Soto, G. Yu, B. & Henneberry, S. (2007)	Supporting the development of narrative skills of an eight-year old child who uses an augmentative and alternative communication device	Intervention study – six-week intervention programme focusing on multiple narrative features. Use of Narrative assessment programme pre and post intervention	n=1
Waller, A. O'mara, D. Tait, L. Booth, L. Brophy-Arnoot, B. Hood, H. (2001)	Using written stories to support the use of narrative in conversational interactions: Case study	Intervention study - effectiveness of introducing a software programme designed to facilitate narrative construction	n=1
Koppenhaver, D. Erickson, K. Harris, B. McLellan, J. Skotko, B. Newton, R. (2001)	Storybook-based communication intervention for girls with Rett syndrome and their mothers	Intervention study - effect of different AAC methods and parental training on shared storybook reading	n=4
Light, J. Binger, C. Smith, A. (1994)	Story Reading interactions between preschoolers who use AAC and their mothers	Descriptive study of narrative interaction between Mothers and children who use AAC	n=5

Table 2.4.2a Summary of papers included following structured literature search

All papers identified for critical appraisal were single case (five of nine studies included) or case series studies. The highest number of participants was five. Due to the small number of participants in all selected studies, generalisation of any findings is not possible. However, corroboration of findings across multiple studies may enable some speculative suggestions to be made regarding AAC narrative interaction. All studies showed a convenience sampling method.

Papers fell into two distinct categories; those examining the AS narrative production or interaction (n=4), and those investigating narrative as an intervention method (n=5). Three of the four descriptive studies investigated the contributions of both AS and NS interlocutors. In contrast, intervention studies focused solely on the narrative language produced by the AS participants. Due to the two distinct categories identified, critical appraisal will be presented within two subsections, drawing comparisons between the papers within each subject.

#### *AS:NS narrative Interaction – observational studies*

Soto and Hartmann (2006), examined the interactions of teachers and four aided communicators with severe speech and physical difficulties. Compromises were found in all areas of narrative discourse measured across five different narrative tasks. However, the participants' ability to maintain the narrative topic was identified as a strength in their interaction skills. All children produced only short phrases or single word utterances limiting the use of more complex grammatical structures. Temporal markers were rarely used for sequencing narrative information and the majority of narratives were not fluent, including numerous communication breakdowns (Soto and Hartmann, 2006). These communication breakdowns could have been accounted for by the potentially ambiguous, short or single word phrases employed by the individuals using AAC. As a result, conversation partners played an important role in clarifying and expanding the discourse of the aided speakers into more complete contributions. This study suggested limits to the narrative language produced by children who use AAC and identified the need for intervention in order to facilitate the development of aided communicators' narrative interactions. Data were only collected on one occasion for each task and thus may not be representative of the participants' typical interactions with AAC. This could also allow confounding variables such as fatigue to have affected findings. This study does, however,



identify the importance of the conversation partner in narrative construction and recognises variation between the teachers recruited.

The teacher's role during narrative interaction with a child who use AAC was further highlighted in the single case study by Soto, Hartmann and Wilkins (2006). This observational case study explored the narrative interactions between an eight year old with muscular atrophy, using high-tech AAC, and her teacher during five different tasks. Narratives produced were analysed using the Narrative Assessment Profile (Bliss, McCabe and Miranda, 1998). The results supported those of Soto and Hartmann (2006), with the participant using primarily one word utterances and showing limited ability in the narrative discourse dimensions measured. Soto et al. (2006) suggested that whilst the teacher played a vital role in the co-construction of the narrative, the frequent use of yes/no questions may limit the child by controlling the interaction. This may indicate some similarities to the findings of NS-AS conversational interaction studies, in which the natural speaker has been shown to ask a large number of questions (Light et al., 1985a).

Together, these papers (Soto and Hartmann, 2006, Soto et al., 2006) provide a descriptive account emphasising the difficulties for children who use AAC in producing narrative language and the resulting role of the interlocutor in supporting them. Soto and Hartmann (2006) began to identify the strategies, such as asking questions, employed to support the AS in constructing narrative. This was expanded upon by Liboiron and Soto (2006) who examined the scaffolding practices used by a Specialist Speech and Language Therapist (SLT) during a shared story reading interaction.

Liboiron and Soto's (2006) participant was an eleven year old with CP who used high-tech AAC. During one data collection session interlocutors were asked to engage in the shared reading of a familiar storybook, no other instruction was given. The interaction was analysed to record frequency of communicative turns, scaffolding practices used by the SLT and semantic complexity of aided speaker turns. In contrast to studies of AS-NS conversational interaction and those of Soto et al (2006), both interlocutors were shown to take a similar number of communicative turns (NS=53.3%; AS=46.7%). This style of interaction was familiar to the AS participant and was frequently used with her teacher, during which the AS was expected to assign turns. For this reason the study suggests

children who use AAC can be equal contributors in interaction within a familiar situation. Comprehension-type questions were the most commonly used scaffolding strategy. This corroborates the frequent use of questioning identified by Soto et al. (2006) despite the disparity in the balance of communicative turns found in these papers. A further difference between these papers was in the length of utterances produced by the AS participant. The AS produced seventeen complete sentences during the narrative interaction recorded by Liboiron and Soto (2006); in direct contrast to the single word utterances and short phrases described by Soto and Hartmann (2006). However, the participant in the Liboiron and Soto (2006) study was three years older, which may account for this. The single case design and inconsistencies with past findings indicate the need for additional research in this field with a larger number of participants. The familiarity of both the storybook and interactional process in this study is likely to have had a sizeable effect on the findings. This suggests an individual who uses AAC may be able to hold a more balanced role in interaction; however further research is needed to support these findings.

The type of narrative task is also likely to have an effect on the opportunity of the aided speaker. For example, formal storytelling is the form of narrative often used in educational settings to encourage language development and literacy. However, the formal narrative setting may offer few participation opportunities for aided communicators due to the dominant role of the natural speaking 'story-teller', as shown by Soto et al. (2006). The dominant 'story-teller' role was also observed by Light, Binger and Smith (1994) in a study of five mother-child dyads during familiar and unfamiliar storybook reading interactions. All the children had cerebral palsy and used a variety of low-tech AAC systems such as sign, gesture and displays of line drawings. Videotaped interactions were transcribed and coded for both communicative modality and function of the communicative act within the interaction. Variation between the demographics of the dyads was considerable, but the mother dominated all recorded interactions. On average the mothers made three times more communicative acts than their children. These findings corroborate those of earlier studies of conversational interaction. However, the variation in the AAC systems employed makes it difficult to identify the effect of specific systems on narrative interaction. Further research is required to corroborate this data and establish if this is resonated in the interactions of children who use aided AAC devices.

Existing studies of AS narrative interaction all suggest the NS plays a role in scaffolding AS narrative production. Three of the four studies reviewed above suggest the AS may hold a passive role in narrative interaction, corroborating with existing studies of AS:NS conversation. However, one study showed the use of familiar narrative storytelling to facilitate more equal NS:AS interactional balance of turns (Liboiron and Soto, 2006). Further research is required to establish the precise roles of each interlocutor during narrative interaction. Although the studies above examined the NS moves, this was secondary to the moves of the AS, and therefore NS' role within narrative interaction remains an under-researched area. The following section examines the studies identified during structured searching that investigate AS use of narrative as a speech and language therapy intervention strategy.

### *Narrative as Intervention*

The lack of opportunity to participate in narrative interactions was identified in a number of the papers selected for review. Lack of narrative experience was seen as a restriction on the development of narrative and complex language structures for children who use AAC (Soto et al., 2006, Soto et al., 2007, Waller and O'Mara, 2003). Due to these restrictions on narrative experience and suggested deficits in the narrative language development of children who use AAC, intervention studies have become the major focus in this field of research. This section therefore examines five studies, identified during the literature search, that examine narrative as an intervention method to facilitate AS language development.

Koppenhaver et al (2001) examined the mother-child story reading interactions of six girls with Rett syndrome, aged between three and a half and seven years old. This study used a multiple baseline design to investigate the effects of three interventions; hand splints, low and mid tech AAC systems and parental training. Parents received a two-hour guidance session at each intervention phase and were asked to videotape interactions with their child reading familiar and unfamiliar storybooks. Analysis was completed on one randomly selected familiar narrative and one unfamiliar narrative at each phase. The findings indicated that children produced most symbolic communication during the intervention phases involving AAC systems and parental training.

Three types of AAC system were introduced to each child during the assistive technology phase. This makes it unfeasible to identify which particular AAC system was most effective in enabling communication. As the same storybooks were used throughout each phase, the potential for a learning effect must also be considered. This is of particular importance as the latter two intervention phases were those producing the most positive results. The methodological limitations of this study restrict the resulting credibility of its findings. However, the paper does highlight a potential positive influence of AAC systems in enabling story-telling interactions.

The positive influence of specialist AAC systems on narrative was also identified by Waller, O'Mara, Tait, Booth, Brophy-Arnott and Hood (2001) in a single case study. Specialist software designed to enable narrative through pre-stored phrase retrieval and interactive editing was provided on a Mac Book to a ten year old girl with dyspraxia and global developmental delay. The participant was familiarised with the software and then used it during three, one-hour sessions a week, over one year. The software was updated with the most relevant vocabulary throughout the study period, supporting the statement that relevant vocabulary provision is necessary for successful AAC use (Waller et al., 2001). There may be some resource implications of this intervention due to the intensive nature of the therapy described. Appropriate dosage of the intervention for maximum impact was also not explored. However, when given the chance to create and produce narratives, the participant was reported to show the ability to control an interaction and demonstrated improvements in all areas of a recognised development profile administered to the participant's mother and teacher. These improvements suggest effectiveness of both the software and also the opportunity to participate in narrative interactions. Due to the length of the study, i.e. one year, natural maturation and development may have also added to the participant's improvement. Further trial of the software over a shorter period of time with a higher number of participants may provide more objective findings.

Koppenhaver et al. (2001) and Waller et al. (2001) focused on augmentative strategies to support narrative production. In contrast, Soto et al. (2007) examined the development of narrative skills through the use of specific narrative tasks as a form of intervention. Soto et al (2007) employed an intervention programme consisting of three narrative tasks, delivered by a

Specialist Teacher, to an eight year old girl with muscular atrophy who used a high-tech AAC device. Alongside the narrative tasks the teacher used scaffolding strategies such as open questions, modelling elaboration and sequencing. This corroborates the high use of questions and scaffolding strategies identified in Soto and Hartmann (2006) and Soto et al. (2006), as discussed in the previous section. Each activity was carried out for twenty to forty minutes once a week, a total of three sessions per week for six weeks. This equals a total of 18 intervention sessions over just 6 weeks, providing a high intensity of intervention. This is likely to have had a positive influence on the outcome, as increased exposure to intervention may lead to increased impact on the individuals' communication. Generalisation probes were also completed after every third intervention session. Previous studies have analysed the productions of individuals who use AAC in relation to those of the NS, whereas this study coded AS productions in isolation. AAC device generations were coded for linguistic complexity in terms of number and type of clause and measures of word class and frequency of use. Story complexity was analysed through the coding of seven defined story elements. Findings showed an improvement in the vocabulary complexity and use of story elements (Soto et al., 2007). Several factors are suggested as potential reasons for this; increased opportunity, written feedback provision and increased teacher skill over time. The lack of experimental control means findings are not attributable to a particular intervention and therefore identification and replication of this is not possible. However, it has been stated that due to the complexities of narrative language, a multi-faceted approach to intervention is required (Soto et al., 2007). Findings may also be limited by the analysis focus on AAC generations in isolation of other communicative modalities, which neglects multiple modality usage in AS interaction. More recent studies have therefore been completed to validate these findings and identify the most effective intervention strategy for improving the narrative skills of children who use AAC.

In a similar study, Soto, Yu and Kelso (2008) investigated a 12-week intervention programme implemented by a Specialist Teacher to improve the narrative skills of a twelve year old with CP. This study employed a multiple probe baseline, two phase (AB) design. The study consisted of a six week baseline phase incorporating six story stem elicitation tasks followed by a twelve week intervention phase of three, 40-50 minute intervention sessions per week. A multi-faceted intervention approach was used due to the complexity of narrative

language (Soto et al., 2008). Intervention incorporated storybook reading and retelling, fictional narrative production and personal narrative production. Alongside this, teacher scaffolding strategies and opportunity for the AS to request new vocabulary were also provided, as in Soto et al (2007). Weekly generalisation probes were completed on the day after intervention sessions. Linguistic and story complexity were analysed following the same conventions as the previous study. Findings corroborated those of Soto et al (2007) with the participant showing increases in all measures of linguistic and story complexity. This study provided a replicable intervention plan, which led to increases in the narrative ability of a single case. Although this study was a single case study, the corroboration with past research strengthens the credibility of the intervention employed.

In order to further investigate narrative language intervention, a single phase intervention study was also completed by Soto, Solomon and Caputo (2009). Unlike the other studies selected for review, this study specifically focused on intervention for the production of personal narratives. Three single cases of SLT or Assistive Technology Specialist and aided speaker dyads were included. Within the three dyads, participant presentation varied in terms of diagnosis and communicative ability. Data were collected during baseline, intervention and maintenance phases. During baseline, generalisation probes and maintenance, participants were asked to describe a familiar event from a photo. The intervention phase comprised two 50 to 60 minute sessions weekly, which incorporated the tasks of personal photo description and emotional state description. The Intervention phase was stated as lasting up to six months, however no specific information regarding length of intervention phase was provided. This limits precise replication of the intervention. Subsections of the Narrative Assessment Profile (Bliss et al., 1998) were coded as 'appropriate', 'variable' and 'inappropriate' and then transferred to the corresponding scores '1', '0.5' and '0'. The use of these three scoring levels does not provide precise detail regarding the use of each narrative structure as the spaces between levels were not equal. However, this did provide a measurable outcome on which progress could be shown over the intervention phase. A modified version of the 'Assessment of Comprehension and Expression Checklist' (Adams, Cooke, Crutchley, Hesketh and Reeves, 2001) was also completed, although detail on modifications made was not provided. Social and ecological validity were checked using a

questionnaire to parents, NS participants and teachers and interviews with NS participants respectively. Little information was provided regarding questionnaire design or interview methodology, limiting the transparency of findings taken from these subsections of data collection. Findings indicated that participation in the intervention program enhanced the participant's personal narrative ability (Soto et al., 2009). Inclusion of descriptions, sequencing and all measures of linguistic complexity increased during the intervention phase. Maintenance of treatment effects was also shown across all measures. Despite the larger sample size than in the majority of past research, this was still a small sample, limiting the generalisation of recorded intervention effects. The fact that all participants, despite variable diagnoses, used the same communication device also reduces generalisation to those using this particular piece of high-tech AAC.

These findings and those of the other intervention studies demonstrate a potential for the use of multi-faceted intervention for the improvement of narrative language skills in individuals who use AAC. However, each study shows improvement despite using different tasks during therapy, making it impossible to identify specific tasks or aspects of intervention that improve narrative skills. It could also be suggested that increased and intensive exposure to the comprehension and expression of narrative language could have acted as a therapeutic factor in these interventions, which contrasts with the limited opportunity generally experienced by children who use AAC. The intervention papers reviewed indicate that children who use AAC may hold a more balanced role in narrative interaction when given the opportunity. Findings also suggest the development of narrative language in AS can be improved. Consequently, the inclusion of opportunities for narrative development is important, as narrative skills have been identified as vital for communicative, social and academic success (Soto et al., 2008).

In summary, the papers reviewed highlight the salient factors within two distinct areas of research in AS narrative interaction; NS:AS interaction and scaffolding, and narrative as an intervention to facilitate AS language development. Within AS:NS narrative interaction the majority of papers suggested that the AS took a more passive role than the NS. This suggests similar findings to existing research of conversational interaction (Clarke and Kirton, 2003, Light et al., 1985a). NS partners were also observed employing scaffolding strategies

such as increased questioning. However, the primary focus in all studies was the AS; meaning further research is required to examine the precise role of the NS during narrative interaction. Intervention studies produced positive findings, suggesting the potential to improve AS narrative and resulting language skills. All studies were found to have limitations, specifically in the restricted detail in description of intervention activities or use of multiple strategies. This made it difficult to identify specific tasks that lead to improved narrative production. The low participant numbers in all selected studies also highlights the need for further research within this field. Further discussion of the specific gaps identified from the review of the literature is provided in the following section.

### **2.4.3 Areas for Further Research**

It is well evidenced that the language acquisition of children with both CP and ASC differs greatly from TD children. However, for all children, the communicative environment and adult models within it play a vital role in the acquisition of language skills. The educational environment is a key context for childhood development and educational interactions are a major source of language learning opportunities. The literature indicates that, as in conversational studies, the NS teacher asks a large number of questions and may dominate interaction with aided speakers. This may be partly due to the commonly used IRF discourse pattern of teacher-pupil interaction discussed in the introduction chapter. However, further research is required to establish the roles played by interlocutors during NS-AS, teacher-pupil interaction.

The limited research base that has examined narrative language indicates that children who use AAC show considerable deficits in narrative ability compared to typically developing peers. In response to this, the majority of research completed in this field has centred on specific interventions to improve narrative abilities, showing positive outcomes from single case or small group studies. This leaves a significant gap in the research, as little focus has been given to the more specific components of the narrative interactions taking place. Some studies have identified scaffolding strategies employed by teaching staff working with the AS. However, few have directly studied how the interaction takes place, and the inter-relationship between NS and AS interlocutor roles in constructing or co-constructing language. By identifying the roles played by both



interlocutors, a more evidence-based approach to the development of interventions may be initiated. By furthering research examining the interactions of teaching staff with AS pupils, the success of varying scaffolding strategies employed by the NS teaching staff may also be evaluated. In turn, this will inform educators of effective support strategies for facilitating AS narrative interaction. Through the identification of the precise modalities of communication in use by both interlocutors, the focus of intervention may be targeted on those modalities used by the AS. Study of NS-AS narrative interaction could also identify any potential limitations to the use of existing AAC technology for this purpose. Due to the dynamic nature of AAC development, these findings could also provide evidence for specific areas of AAC advancement.

The multi-modal nature of NS-AS interaction, interlocutors' roles in interaction and importance of narrative are recurring themes in the reviewed literature. However, due to the intervention focus and small scale of existing studies there remain gaps in the research field regarding the specific roles played by the interlocutors and the resulting co-construction of narrative language. The provision of this data, examining the structure and roles of the NS:AS within narrative interaction, may enable more informed development of narrative intervention strategies; for example, in order to identify the optimum conditions to encourage interaction, participation and development of narrative for children who use AAC (Bedrosian, 1999, O'Keefe et al., 2007, Waller et al., 2001).

## **2.5 Research Questions**

Consequently, the current study aimed to examine narrative interaction in teacher-pupil (NS:AS) dyads with a view to making a contribution to the understanding of NS:AS roles in narrative interaction and resulting areas of speech and language therapy intervention, teaching strategies and AAC development. These areas were all highlighted in the structured review of the literature as requiring further investigation in order to further develop our understanding of AS language use and development. In order to target specific areas of the research field, one over-arching research question was formulated under which three more specific areas were investigated:

How is narrative constructed within a teacher (natural speaker) - pupil (aided speaker) dyad under the conditions of: a) personal narrative and b) fictional narrative? This was investigated through specific address of three research questions:

RQ 1. What characterises the communicative roles occupied by teacher (natural speaker) and student (aided speaker) in the construction of narrative?

RQ 2. How does narrative condition affect the contributions of teacher (natural speaker) and student (aided speaker)?

RQ 3. How do communicative modality and linguistic move-type correspond in the narrative interaction?

## **2.6 Summary**

NS-AS interaction remains an under-researched field. Advances in technological development are dynamic and ever changing. In order to maximise the communicative potential of children with complex communication needs through the introduction and use of communication technologies, there needs to be development of the research evidence base. A focus on narrative introduces a language-rich context for the investigation of interaction. This context and the in-depth study of NS:AS roles within interaction may inform educational, speech and language therapy and technological aspects of this research field. The following chapter provides the study design and methodology developed for the address of the research questions outlined above.

# Chapter Three

## Methodology

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### 3.1 Introduction

This chapter focuses on the research design and methodology. It covers study design; ethical considerations; participant recruitment; the dependent variables; development of instrumentation and pilot study; data collection, sampling and analysis; reliability and statistical analysis.

### 3.2 Study Design

A case series study was conducted using a mixed methodology of observational techniques and applied linguistic analysis. Children who use electronic communication devices constitute a small population and recruitment of sufficient numbers for a group design presented a challenge. Furthermore, heterogeneity of the target population supported a case series approach (Detheridge, 1997), which also enabled collection of a wider range of data than in previous single case, research studies (Waller et al., 2001, Liboiron and Soto, 2006, Soto et al., 2008). As such, they have been viewed as extremely valuable for the development of the AAC field (McEwen and Karlan, 1990). Comparisons between individual participants is possible, as advocated by Light and Smith (1993) who recommended analysis at a 'molar level' - focusing on group results, and at a 'molecular level' - focusing on individual case results.

To counteract low participant numbers and the heterogeneity of the target population, methods supporting the detailed investigation of the narrative interaction for each case were adopted. The scale of data collection was designed to cater for variation in participant behaviour over time, improving representativeness of the data and to control for the potential impact of external factors such as participant fatigue, illness and time of day. It also increased the

volume of data per participant as a counterpoint to low participant numbers. Four visits were made to each participant for the purpose of data collection, where two narrative conditions were recorded: (i) personal narrative (PN), and (ii) fictional narrative (FN). This yielded eight narrative interactions for each natural speaker (NS): aided speaker (AS) dyad. It was originally intended to cover three data collection points over six months. However, unforeseen extension of the recruitment period meant this was not possible in the project timescale (see section 3.4 p.68). Therefore, four data collection sessions were completed over the reduced time period of 3 months. Two data collection sessions were held at point zero and two sessions were held after a period of three months. No more than two weeks were allowed between the two initial data collection sessions and those at the three-month point. The two week restriction between sessions one and two, and three and four, was to control for the confounders listed above at each of the two data collection points. The gap of three months was employed to counteract any possible bias through the learning of narrative skills and to allow for repetition of one fictional stimulus (see section 3.7 p.89). Transcriptions, including both verbal and non-verbal aspects of communication, were produced for each interaction to make sure no communicative elements of the interaction were overlooked. The study also employed multiple measures to extract as much information from the data collected as possible, discussed in section 3.5 (p.72).

### **3.3 Ethical Considerations**

A proposal was submitted to the University of East Anglia School of Education and Lifelong Learning Ethics Committee on June 21st, 2009. Initial review produced two questions about the methodology:

- 1) Will consent from head-teachers be sought?
- 2) Could the information sheet for children make it clear that they can pull out at any time if unhappy about the project?

These issues were responded to appropriately with minor alteration to the information sheet. On July 9<sup>th</sup> 2009 full ethical approval was therefore granted. The ethical issues considered and managed are provided below.

- Information sheets

To establish informed consent three information sheets were created for:

- 1) The Primary Carer of the potential participant (appendix B1)
- 2) The associated member of Teaching staff (appendix B2)
- 3) The AS participant (appendix B3)

Information sheets 1) and 2) were text based, in a question and answer format to provide all basic information regarding the research project. Details were provided on the implications of participation, time commitment, research tasks, confidentiality, security and ethical issues. Information was included about the procedure for complaints and withdrawal from the study. The timescale for storage of data and dissemination of the research was also included. Contact details for the researcher were given and primary carers and teaching staff were invited to ask any questions via these contact methods.

Information sheet 3) was designed to be accessible to potential participants. Simplified text was used alongside relevant images or symbols taken from Windows Clipart to support the participants' understanding. The same topics were covered as in information sheets 1) and 2) as it was felt participants should be aware of all aspects of the project, including methods for complaint or withdrawal. Although the participants were all below the chronological age at which consent is legal, as introduced through the Family law reform act (1969), the researcher wanted to ensure all participants understood as much as possible about the work in which they were taking part and were given the choice to participate or not. These information sheets were also used as a guide at the start of each data collection session to remind participants of the purpose of the study and provide them with the opportunity to confirm their willingness to participate.

- Consent

Consent forms were produced for:

- 1) Parents/Guardians of AS participants (appendix B4)
- 2) Teaching Staff participants (appendix B5)

Because the potential AS participants identified by the gatekeepers were under the age of 16 years, consent forms were sent to parents of any children who use AAC identified as potential participants. The forms were designed to be

clear in requesting consent for participation in the study and for the sharing of data collected. When consent forms were returned, parents were directly contacted to check they had no questions and to confirm consent and contact details. A copy of the consent form was then returned to the parents.

Consent forms were also provided to potential teaching staff participants with the information sheet described above. An initial meeting was arranged to discuss the research study and procedure. At this stage all teaching staff were reminded that they could withdraw at any point and were asked to confirm their intention to participate.

- Confidentiality

Participant anonymity was not possible at the data collection stage because of video capture. However, to compensate for this, the identification of each participant was anonymised, using a single letter on all documentation relating to the study data. Any publication or presentation of the data uses this letter to provide anonymity within the wider population. Access to project data was granted exclusively to the researcher, the supervisors and members of the researcher's supervisory panel.

Data were stored within locked filing cabinets in a secure office at UEA, to which the researcher had sole access. All computer files and data were kept on secure, password protected, server space or external hard drives stored securely in the locked filing cabinets. With parental and teaching staff consent, the original video data would be kept for a total of five years from the date of collection, at the end of which it would be destroyed. Consent was requested separately for the use of edited sections of video for presentations and publications to professionals, university staff and other individuals who use AAC.

- Participant Comfort

Comfort is vital to ensure participants are engaged and willing to participate in data collection. For this reason, comfort outweighed more favourable acoustic conditions for data collection. Recording sessions were therefore completed in a familiar setting for the participants. The researcher assumed the role of marginal participant whereby the purpose of the researcher's presence was known to the participants, but no part was taken in the interaction and activities (Robson, 1997).

Positioned behind both participants, the researcher played a passive role in the data collection, whilst checking for the participants' comfort and posture maintenance – particularly for those participants with cerebral palsy. This was essential, as the NS participant may have become too engaged in the interaction.

Drinking water was made available to the participants as appropriate and as advised by the teaching staff. Participants were informed that they or the researcher could stop data collection at any point if they observed or felt any discomfort. Data collection would only continue once personal comfort had been checked and any issues had been addressed. If this was not possible, data collection would be stopped entirely.

Prior to the recording session, the researcher met with the teaching staff to reiterate their role in the interaction, making sure they felt confident with the tasks to be completed. Contingencies were made in case teaching staff participants were called away during data collection. In this instance the researcher would switch off recording equipment and note the point reached in the procedure. The AS would be asked if they were comfortable to wait for ten minutes. If they replied 'yes' the researcher and AS would wait ten minutes, if within this time the NS did not return, the session would be ended to avoid any extra disruption to the participants' routine. If the NS returned within ten minutes an informal conversation would be held to ensure all participants were willing to continue. Recording equipment would then be turned back on and data collection would continue.

The fact that any participant may be withdrawn at any point was emphasised during recruitment and prior to each data collection session. This ensured no participant was involved whilst unwell or unwilling. In addition, there was the option of data collection over two days instead of one, should it be desired, as a way of dealing with fatigue or poor health. This enabled data collection to be completed the following day if necessary.

Awareness of and compliance with the school's policy regarding seizures was ensured. In the instance of a participant having a seizure, the school procedure would be followed. All recording equipment would be switched off immediately and assistance sought. The presence of a familiar teacher as a

participant in the dyad who would take the lead as required was a further insurance against risk.

The use of video and audio recording may be uncomfortable for some participants. For this reason, participants were asked to give consent for the use of these data recording methods during the recruitment/informed consent procedure. At the start of each data collection session, participants were asked if they were in agreement for data to be captured by video and audio recorder. They were also reminded that they could ask for the recording equipment to be paused or stopped altogether at any point.

Participation in the research project required a time commitment from participants, which could impact on their daily routine. The participants were fully informed of this commitment prior to giving consent. Data collection sessions were organised at the most convenient time for both participants to minimise disruption to daily routine and tasks.

### **3.4 Recruitment**

#### **3.4.1 Sampling**

Due to the small population of children who use high-tech AAC and the time-scale of the study, an optimum sample of six participants was proposed. This number was selected as it was both a realistic number of participants to recruit within the timeframe and also increased the possibility of inferential statistical analysis.

Single cases were recruited via a snowballing strategy (Pring, 2005) which identified participants initially through known local specialist contacts, who then recruited through their own specialist knowledge and contacts and so on. Sampling was completed on the basis of inclusion/exclusion criteria. The initial criteria for AS participants are shown on the following page:



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**Criteria to be met by all AS participants:**

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In the early years of primary education – preferably between the age of 5 – 8 years old

In a special or mainstream school in the county of Norfolk

Using a high-tech AAC system based around a tablet PC (e.g. Dynavox, Tellus) as a principal modality of communication for over 6 months to ensure the population is familiar with the system in use.

Communication competence in receptive language at the three word level and above; as assessed by a Speech and Language Therapist, and detail of which was taken from their past records.

Be at particular key stages and parts of the curriculum – English, key stage 1 and 2 – Literacy, Story-telling and Listening

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Table 3.4.1a Initial inclusion criteria for recruitment to the study

After initial recruitment queries via local Specialist Speech and Language Therapists were met with a poor response, the criteria were revised to establish broader inclusion. The second criteria were as follows:

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**Criteria to be met by all AS participants:**

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In primary or the early stages of secondary education – between the age of 6 – 13 years old

In a special or mainstream school in the South-East of England –

Including the counties of Norfolk, Suffolk, Cambridge, Essex, London, Hertfordshire

Using a high-tech AAC system based around a tablet PC (e.g. Dynavox, Tellus) as a principal modality of communication for over 3 months to ensure the population was familiar with the system in use.

Communication competence in receptive language at the two word level and above; as assessed by a Speech and Language Therapist, and detail of which was taken from their past records.

Be at particular key stages and parts of the curriculum – English, P Level 6-8 or key stage 1 and 2 – Literacy, Storytelling and Listening

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Table 3.4.1b Revised inclusion criteria for recruitment to the study

A wider age range and geographical context were included. The increase in age range was suggested due to the higher number of children who use AAC identified by the local Specialist Speech and Language Therapist within this group. The amount of time spent using the device was altered as one teacher reported having suitable participants apart from this criterion. This teacher was

asked to confirm that the potential participant was confident in using the device and would be able to complete the research tasks despite only having it for three months. This was confirmed, and therefore this criterion was changed to further encourage higher numbers for recruitment. Once the above criteria had been finalised and deemed realistic by local SLTs and the supervisory team, participant recruitment was carried out.

### **3.4.2 Recruitment Strategy and Challenges**

Participant recruitment was carried out in two phases. The initial recruitment procedure used existing contacts with Specialist Speech and Language Therapists and a local Assistive Technology Centre. This strategy identified only one potential participant for the study. It was therefore decided that a second recruitment strategy targeting a wider geographical area was needed.

A project information campaign was initiated in which posters and flyers advertising the study (see appendix B6) were distributed to all special schools, assistive technology centres and Specialist Speech and Language Therapy Departments within the counties of Norfolk, Suffolk, Essex, Cambridge, London and Hertfordshire. Their contact details were retrieved from the Ofsted, Communication Matters and National Health Service databases. Advertisements for participants were also placed on the relevant internet forums from Communication Matters – the UK chapter of the International Society for Augmentative and Alternative Communication; 1Voice – an organisation for children and adolescents who use AAC devices and the National Health Service AAC Special Interest Group.

During the second phase of recruitment, incentives were introduced to encourage participation. The incentives offered were the provision of a DVD of all the completed data collection sessions for both the AS and the NS participants. Secondly, the invitation to a story telling workshop at which the results of the study would be presented, alongside information and interactive story-telling sessions. This workshop would be offered when all data collection had been completed. However, no participants or carers accepted this invitation. The introduction of incentives was felt necessary due to the limited response to initial recruitment attempts. When asked, all participants stated that these incentives

were seen as an additional benefit to participation and not the sole reason for giving consent. The recruitment procedure is summarised in Figure 3.4.2a

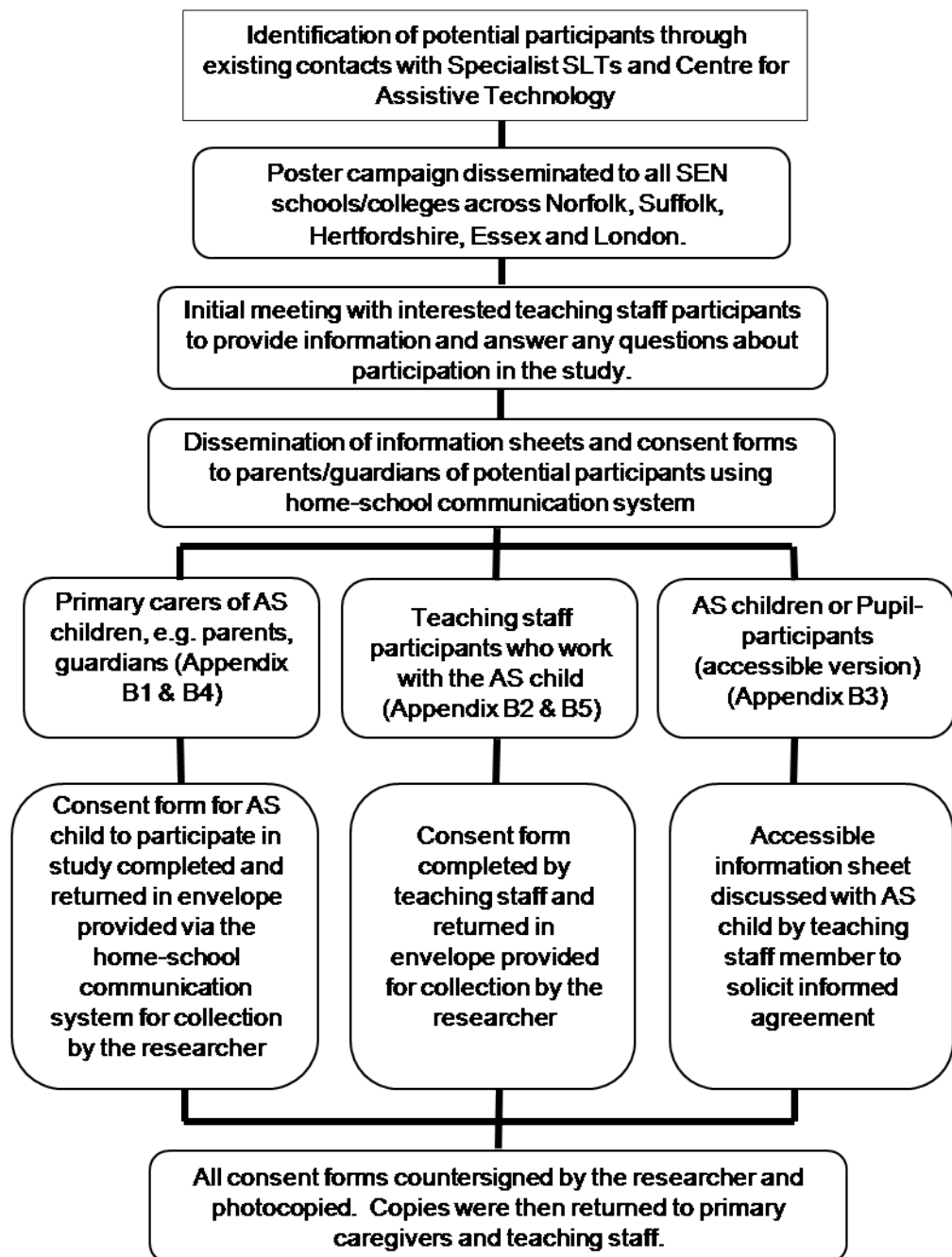


Figure 3.4.2a Recruitment pathways for AS and NS participants

Following the poster campaign, teaching staff members and SLTs made e-mail contact with the researcher regarding potential participants. Information sheets and consent forms were then sent to the teaching staff of all potential AS participants and an initial meeting was arranged. During this meeting the data collection procedure and all ethical issues were discussed. Teaching staff were encouraged to ask any questions about the study and, if willing to participate, signed the consent form. Information sheets and consent forms were then sent to

parents of potential AS participants via the home-school communication system. Once consent forms were returned, the researcher contacted all parents of AS participants to check they had no questions and were happy for the data collection procedure to start.

### **3.5 Dependent Variables**

There were three dependent variables of interest: communicative modality, linguistic move-type and linguistic complexity. They were employed in order to provide an in-depth investigation of the narrative interactions recorded. Due to the low predicted participant numbers it was necessary to employ multiple measures in order to gain as much information from the recorded narratives as possible, increasing the validity of the current study. The dependent variables were selected in order to ensure investigation of the whole process of narrative production, incorporating both physical production of communicative acts and the discourse structure these acts were used to produce.

#### **3.5.1 Linguistic Move-type**

Linguistic move: a single or string of communicative signals, either verbal or non-verbal, produced by an individual within a conversational turn (Pennington and McConachie, 1999).

Previous studies of AS interaction have reported the NS using significantly higher initiation moves than the AS, resulting in the AS occupying a more passive role during conversational interaction (Light et al., 1985a, Clarke and Kirton, 2003). However, limited research has investigated this in narrative interaction. Existing literature focuses on the efficacy of interventions in improving the linguistic moves made by an AS and not on providing detailed analysis of the moves produced (Soto et al., 2009, Soto et al., 2008, Waller et al., 2001). To fulfil the research aims and to gather information regarding narrative interaction between NS and AS interlocutors, it was necessary to examine the linguistic moves made by each interlocutor, and thereby determine the discourse structure. In addition, subdivision of the linguistic moves into initiation and response categories introduced an analysis of the pragmatic aspects of the discourse. The analysis of initiation and response moves enabled observation of the dominant

and passive roles within the interaction, and whether this was impacted by teacher-pupil roles. Data exists regarding mainstream teacher-pupil discourse, producing identifiable patterns such as the IRF framework (as discussed in Chapter Two). More limited research has examined the impact of a pupil who uses AAC on this discourse pattern.

In order to identify the functions of different types of initiation and response moves, a coding framework was designed, based on the HCRC coding structure by Carletta, Isard, Doherty-Sneddon, Isard, Kowtko and Anderson (1997). The linguistic move framework was developed through piloting and reliability testing detailed in section 3.6.2.

### **3.5.2 Linguistic complexity**

Linguistic complexity: This is defined as the level to which lexical and syntactic devices are used in the construction of narrative (Soto et al., 2009) .

Past research has examined the linguistic complexity of narratives produced by children who use AAC in terms of progress associated with particular interventions (Soto et al., 2009). However, little information is available regarding the effect of narrative type on AS linguistic complexity. Inclusion of linguistic complexity measures in this study also provided a greater level of insight into AS narrative production, by providing data regarding the specific lexical features employed and those omitted by the AS. Three component measures were therefore used in order to examine the linguistic complexity of the AS narrative contributions.

The total number of words (Tokens) and total different words (types) are commonly used measures of linguistic complexity within speech and language therapy research. In addition to this, the measure type-token ratio (TTR) was also selected in order to further examine the complexity of narratives created. TTR is also a norm-referenced measure, allowing the results collected in this study to be compared with it.

Murray and Goldbart (2009b) stated that individuals who use AAC tend to use a higher number of content words than function words. This may be due to

the lack of function words within the vocabulary provided (Murray and Goldbart, 2006). Limiting the use of function words may also simplify communicative turns due to the complexity of constructing a complete sentence using an AAC device. The employment of content and function words during narrative construction by aided speakers is currently under-researched, although, the examination of 'story-grammar' by children who use AAC has been completed (Soto et al., 2007). The analysis of content and function words in the current study also provided a more detailed picture of the aided speakers' narrative construction.

### **3.5.3 Communicative Modality**

Communicative modality: A vocal or non-vocal act employed as a signal bearing meaning for communication with another person. For example: speech, vocalisation, motor and facial gesture and eye gaze. 'Communicative modality' can also include receptive modalities such as listening or reading (Herr, 2007). For the purpose of the current study, the term 'communicative modality' will only refer to productive modalities (see examples listed above) as the focus was on the mutual contributions of interlocutors to narrative interaction.

Existing research has suggested that conversational interaction between NS and AS tends to be multi-modal even when there is a method of AAC in use (Light et al., 1985c). Further studies in the field have observed this in parental, peer and professional interactions with children who use AAC. Light et al., (1985c) showed some potential influence between interlocutors' choice of modality on the communication partner's response modality during parental interaction. Little evidence is available to identify whether this is also the case in teacher-pupil interaction with a child who uses AAC. Clarke and Kirton (2003) identified AS preferences for natural modes of communication, such as gesture and vocalisation, instead of communication aid use, during peer interaction. However, there is little literature evidencing the communicative modalities employed during narrative interaction. Existing studies have instead focused on the discourse structure and quality of narrative produced by individuals who use AAC as opposed to the signals bearing meaning. The latter aspect formed one aim of this study: to determine the modalities employed to represent meaning in the narrative within the interaction.

The large number of communicative modalities identified in studies of NS:AS interaction (Bedrosian, 1997, Smith, 2006b, Soto and Hartmann, 2006) indicated that the coding framework needed to be inclusive of the range of possible communicative acts. This measure was therefore developed through a pilot study of AS interaction captured on video. Details of this pilot and developments to the coding structure are provided in sections 3.6.1 and 3.6.2.

The researcher was unable to identify published and validated measures for the communicative modality and linguistic move-type, even though the Carletta et al. (1997) framework provided a useful starting point. For this reason, two new coding structures were developed in order to analyse the data. The development and reliability testing of the outcome measures is described below.

## **3.6 Development of instrumentation**

### **3.6.1 Development of coding structures**

Coding of Linguistic Move-Type:

Development of a coding structure was necessary for the measurement of linguistic move-type. Within the Human Communication Research Centre (HCRC) Carletta et al. (1997) had developed a linguistic move coding scheme to analyse a corpus of data obtained during a barrier task between NS individuals. Despite being designed to analyse language elicited during an instructional task, this coding scheme contained a number of categories that were relevant to the current research.

Previously, Stirling, Fletcher, Mushin and Wales (2001) had compared the HCRC coding scheme with another structure known as the DRI/DAMSL scheme (Jurafsky, Schriberg and Biasca, 1997). Stirling et al. (2001) concluded that the DRI/DAMSL scheme produced a more detailed analysis of interaction. However, this was time consuming and included codes that were not used during their analysis. The HCRC scheme was shown to be less informative but easier to use, especially when both transcript and speech sample were being used during coding. Stirling et al. (2001) suggested a combination of the two structures or a more personalised and piloted scheme was the most efficient mode of coding. It was therefore decided that the HCRC scheme would be used as a foundation for a linguistic move coding scheme to be developed by the researcher. The original

coding structure used by Stirling et al. (2001) in their comparative study contained the following categories:

<b>Preparations:</b>	
<b>Ready</b>	Moves that occur after the close of a dialogue game (roughly, a speech exchange) and prepare the conversation for a new game to be initiated
<b>Initiations:</b>	
<b>Instruct</b>	Commands the partner to carry out an action
<b>Explain</b>	States information that has not been directly elicited by the partner
<b>Check</b>	Requests the partner to confirm information that the speaker has some reason to believe, but is not entirely sure about
<b>Align</b>	Checks the partner's attention, agreement or readiness for the next move
<b>Query-YN</b>	Asks the partner any question that takes a yes or no answer and does not count as a check or align
<b>Query-W</b>	Any query not covered by the other categories
<b>Responses:</b>	
<b>Acknowledge</b>	A verbal response that minimally shows that the speaker has heard the move to which he/she responds, and may also demonstrate that the move was understood and accepted
<b>Object</b>	A minimal negative response to a move indicating that it was understood but not accepted (Grice and Savino, 1995)
<b>Reply-Y</b>	Any reply to a query with a yes-no surface form that means 'yes', however it is expressed
<b>Reply-N</b>	Any reply to a query with a yes-no surface form that means 'no', however it is expressed
<b>Reply-W</b>	Any reply to any type of query that does not simply mean 'yes' or 'no'
<b>Clarify</b>	A reply to some kind of question in which the speaker tells the partner something over and above what was strictly asked

Table 3.6.1a Original Stirling et al. (2001) linguistic move codes and definitions

This coding structure was first tested on the pilot data, which led to further development of the coding structure. The pilot study and further adaptations to the coding strategies are discussed in sections 3.6.2 and 3.6.3.



### Communicative Modality:

It was not possible to find a satisfactory measure for analysis of communicative modality within existing research. The development of a new coding structure was therefore necessary. Through repeated viewings of data from another research project involving NS:AS interaction within an education environment the first draft version of this coding structure was developed (Table 3.6.1b) (Bailey and Bunning, 2009).

<b>Communicative Modality</b>	<b>Code</b>
Speech	Sp
Vocal Gesture	V
AAC-Encoding	AAC-E
AAC-Output	AAC-O
Eye Contact	E
Gesture	G
Sign	S
Environmental Reference	Env.

Table 3.6.1b Initial communicative modality draft coding structure

This draft coding framework was tested by carrying out momentary time sampling (MTS) on the sampled data taken from the external research project. Due to its development in behavioural research it was felt this may be an appropriate methodology for examining the NS:AS interaction. MTS is a systematic observation method in which it is recorded whether a target behaviour is happening at the end of a specified interval e.g. 10 seconds. The end of the specified interval is most often indicated by a sound, which cues the coder to immediately code the occurrence of specified behaviours at that moment. Coding of the behaviours is completed at each cue for the entire data set. For example, if a time interval of 10 seconds was employed, the researcher would code the occurrence of pre-specified behaviours every ten seconds throughout the data set. The data yield the proportion of time spent engaged in each behaviour during the recorded interaction. The reader is referred to the seminal paper authored by Brulle and Repp for further definition (Brulle and Repp, 1984). MTS was developed by two psychologists for the measurement of specific behaviours during general activity (Bindra and Blond, 1958). Further detail on this method is reported in section 3.6.2, and a reliability study on the use of MTS is provided in Chapter Four (p.108). For this analysis, bleeps were superimposed onto each

recording at ten second intervals; the researcher then coded the communicative modality in use at each bleep (Brulle and Repp, 1984). The development of the communicative modality coding structure is provided in the following sections (3.6.2 and 3.6.3). Once coded, these data were used to provide comparisons between communicative modality usage by NS and AS. The use and validity of MTS is discussed further in Chapter Four.

During the first test of this coding structure, two new codes were introduced; these were 'facial expression' and 'shared attention'. Shared attention was included to recognise the instances in which both participants looked at the same object, in this case the AAC device, and were both aware they shared this focus (Tomasello, 1995). Facial expression was observed frequently during the trial and played a significant communicative role in the interaction. This was therefore incorporated into the coding structure. The codes 'neutral' and 'not possible to code' were also introduced. This ensured occasions in which a participant was doing nothing in particular and not performing a communicative act were also captured to provide a more complete representation of the interaction. 'Not possible to code' was coded when factors such as camera obstruction resulted in it being impossible to accurately code the modalities in use.

The pilot data collection session (section 3.6.2) was then conducted, resulting in the recording and analysis of a single fictional narrative interaction.

### **3.6.2 Pilot study**

A pilot study was conducted to test the feasibility of the data collection methodology, outcome measures and refine the protocol (Bailey and Bunning, 2011). The pilot study consisted of a single fictional narrative by one participant with a familiar teaching assistant. The AS participant was a 12:04 year old girl with Cerebral Palsy, referred to as S. At the time of the pilot she was using a laptop with MindExpress™ Software accessed via single switch selection and row-column scanning. S was reported as consistently linking three symbols or more if the vocabulary she wanted was available. She had a receptive language level of P8/level 1 and expressive language level of P7. P levels are descriptors used to record the level of students with SEND working toward National Curriculum level 1 (see appendix A2 for P level definitions). The NS participant had been working

with S for three years and had nine years' experience working with children with SEND (see NS2 appendix B7).

Data were collected in a familiar room at the participants' school. The participants were positioned at approximately 90° to each other, ensuring both were able to see the narrative stimulus, the AAC device and each other. The fictional stimulus used for the pilot data collection was 'The Squirrel Story' (Carey, Leitao and Allan, 2006)

A brief explanation of the recording equipment and task was provided to both participants. Informed agreement was then given by the AS and NS for the recording equipment to be switched on. An informal conversation and introduction to the task was provided by the NS, allowing time for both participants to become comfortable with the recording equipment and to limit camera reactivity. The NS and AS looked through the picture book with the NS making comment on any relevant characters and plot lines that were thought to be important to enable the AS to retell the story. Once the book had been completed by both participants, the AS was then asked to retell the story to the NS from the pictures.

The NS had been informed of the following procedure in order to close the narrative interaction. Once the AS appeared to have finished their narrative, the NS was told to ask, "is that everything?" or equivalent. If the AS participant continued, the NS then repeated this prompt once more before assuming the AS had finished the next time they stopped producing AAC output.

The informal conversation and brief introduction of the task were omitted from the analysis to limit the effect of camera reactivity on the findings (Penner, Orom, Albrecht, Franks, Foster and Ruckdeschel, 2007). All verbal and non-verbal acts recorded were transcribed into standard orthography employing an adapted version of the conventions from Von Tetzner and Jensen (1997) shown in appendix B9. Transcripts were used alongside video capture to improve accuracy of coding each interaction.

Two levels of coding were carried out on the transcribed data. Firstly, communicative modality was coded by using momentary time sampling (MTS) as described in section 3.6.1 (Bindra and Blond, 1958). MTS was used in conjunction

with the communicative modality coding structure developed through observation and coding of existing data. The second coding structure used was the Human Communication Research Centre Move Category Codes (Based on Carletta et al, 1997). The original HCRC coding structure incorporated the preparation code: ready; initiation move codes: instruct, check, align, query-YN, query-w; response move codes: acknowledge, object, reply-Y, reply-N, reply-W and clarify (for full code definitions see table 3.6.1a). Throughout the initial pilot data coding, it was apparent that several linguistic moves were not possible to code using the above categories from HCRC structure. This led to adjustments to the coding structure to which codes for 'narration', 'choice', 'praise', 'comment' and 'response' to an instruction were added.

An inter-rater reliability study was completed on both of the above coding structures in which 30% of the data was coded independently by the primary supervisor. Full code definitions, coding rules and summary sheets were provided to the second coder. A practice session was also completed in which a sample of data was coded and then discussed between coders. Any disputes were considered and a consensus was reached through examination of code definitions and coding rules. Once high levels of agreement were reached during the practice session, the reliability study was completed. A Cohen's Kappa Coefficient was completed to test inter-rater reliability. The communicative modality coding structure produced a good reliability rating ( $K = 0.73$ ) according to Fleiss (1981) interpretation. The linguistic move-type coding produced a K value of  $K = 0.55$  showing a fair level of reliability (Fleiss, 1981). The 'fair' score was attributed to flaws in the early developmental stage of the coding structure. For example, some linguistic moves employed were found to be missing from the codes available. Both coders showed some disagreement in deciding where certain moves should be coded as they did not fit into the available categories. Definitions of the codes 'comment' and 'acknowledge' were also refined as these codes showed the highest level of disagreement between coders.

The findings from the pilot study present an overview of the fictional narrative interaction between an AS and NS. Both participants used multimodal communication. The NS used a total of eight different methods of communicating and S utilised seven communicative modes. There were some distinct differences in the employment of the individual communicative modalities and the number of

communicative acts completed (Table 3.6.2a). For example, eye contact is shown to be important in the interaction, however the NS appears to use this considerably more than the AS (NS n= 46; AS n= 18).

<b>Code</b>	<b>AS1</b>	<b>AS % Total</b>	<b>NS1</b>	<b>NS % Total</b>	<b>Total</b>
Speech	-	-	65	29.50	65
Vocal Gesture	-	-	-	-	-
AAC-Encoding	4	3.80	3	1.40	7
AAC-Output	2	1.90	-	-	2
Eye Contact	18	17.30	46	20.90	64
Gesture	2	1.90	8	3.60	10
Sign	-	-	3	1.40	3
Facial Expression	2	1.90	1	0.50	3
Env. Reference	1	1.00	19	8.60	20
Shared Attention	75	72.10	75	34.10	150
Neutral	12	N/A	12	N/A	24
Not Possible to Code	5	N/A	-	N/A	5
<b>Total Coded Instances</b>	121		232		353
<b>Total Coded Comm. Acts</b>	104	32.10%	220	67.90%	324

Table 3.6.2a Frequency and proportional use of each communicative modality for each participant

The raw data were analysed to determine the proportion of total communicative modalities for the AS and NS expressed as percentages. Table 3.6.2a shows how the NS held 67.90% of the total communicative acts and the AS held only 32.10%. Shared attention was shown to be an important aspect of the interaction with the highest proportion of communicative acts for both participants (NS n= 34.10%; AS n= 72.10%).

Some disparities were also shown in the analysis of linguistic move-types produced by the NS and AS (Table 3.6.2b). For example, the majority of the NS moves came from yes/no questions (n= 59) and acknowledgements (n= 79). In contrast, the AS predominantly produced positive response moves (n= 30). This measure also demonstrated the dominance of the NS as they took approximately four times more linguistic moves than the AS (NS n= 327; AS n= 82). S made no initiations during the narrative task, and responded principally to yes/no questions or choices given by the NS. The NS made a total of 219 initiation moves and 108 response type moves.

<b>Linguistic Move-Type</b>	<b>AS</b>	<b>NS</b>
Ready	0	1
Instruct	0	28
Explain	0	39
Check	0	36
Align	0	5
Query-Y/N	0	59
Query-W	0	29
Choice	0	23
Acknowledge	1	79
Object	0	5
Reply-Y	30	0
Reply-N	15	0
Reply-W	0	0
Reply-I	14	0
Clarify	0	0
Comment	0	5
Narrate	22	0
Praise	0	24
<b>Total Preparation Moves</b>	0	1
<b>Total Initiation Moves</b>	0	219
<b>Total Response Moves</b>	82	113
<b>Total Coded Moves</b>	82	333

Table 3.6.2b Frequency of linguistic move types used and total move types for each participant

These findings show the NS dominance of the interaction. The findings also indicate the multi-modal nature of AS:NS interaction with both participants demonstrating use of a wide range of communicative modalities.

The pilot study established the feasibility of the methodology to be used in the main study. The fictional stimulus successfully elicited narrative data, captured on video. Participants demonstrated no external signs of camera reactivity according to Penner et al. (2007) and gave positive reports of the data collection procedure. The MTS coding structure enabled examination of the modalities employed and was relatively quick to administer. It also had the advantage of yielding proportions of modalities used against time. Coding of linguistic move-types allowed analysis of the discourse structure, in terms of initiation and response moves made, and the move-types according to their individual

functions. The findings from the pilot therefore indicated that the methodology was fit for purpose.

Some minor alterations were made to ensure the optimal quality of data collection in the full study. A wider camera angle was used to ensure both participants could be captured at all times, including unpredicted movement or re-positioning. The pilot also highlighted the importance of ensuring NS confidence in the data collection procedure to allow the researcher to remain in the role of marginal participant. A guidance sheet providing an outline of each part of the session was therefore made available to NS participants in the full study, enabling them to complete the session in the correct order without requiring guidance from the researcher (appendix B10). This sheet was also introduced to aid the transition between the two narrative constructions (personal and fictional narrative), as this was not piloted due to only a single narrative being captured in the pilot study. No further adaptations were made to the data collection procedure for the full study (3.7).

Further development of the two coding structures was completed prior to the full study, to ensure all communicative modalities would be captured and linguistic move categories were as clearly defined as possible. This is discussed further in the following section.

### **3.6.3 Further Development of Instrumentation**

#### *Coding of Linguistic Move-Type:*

The pilot highlighted several areas in which the linguistic move-type coding scheme needed developing. The code 'Query-choice' was added to the structure. During the pilot the NS often offered the AS a choice of two answers in order to simplify a W-type question. The second addition to the scheme was 'response to an instruction'. Despite there being an 'instruct' code in the original structure there was no equivalent response code. Instructions were shown to play a notable role in the pilot narrative interaction to which the AS often responded directly.

It was noted that feedback in the form of praise was unaccounted for in the original scheme. As a frequently used move-type, this was added to the responses category of the framework. During the pilot data, a number of instances

were recorded in which the NS commented on something. This often occurred during technical issues with the device or whilst the AS was trying to access and encode on the AAC device. The code 'comment' was introduced to the scheme in order to capture these moves. As a result, the definition of the code 'acknowledge' was also refined as these two codes had some similar characteristics. Accurate definition was therefore required to ensure reliability of coding between these two move-types.

The edited coding scheme was then used to re-code the pilot data. Although this provided satisfactory inter-rater reliability figures, further discussion with supervisors, peers at international conference and via initial coding of the full study data prompted further development of the scheme. These included the addition of the code 'reply-choice' to acknowledge a response made in relation to something coded as a 'query-choice'. This had been neglected when the code 'query-choice' was first included in the scheme. During analysis of full study data a code was needed to recognise summaries made by the NS identifying narrative elements that had been produced up to that point in the interaction. This often acted as a reminder to the AS due to the length of time it took to produce each part of the narrative. The code 'summarise' was introduced, defined as: a statement made that provides a summary of the narrative or part of the narrative that has been told up to that point. Sentence completion was also observed during initial coding of the data. This strategy meant that the AS's productions were framed and grammatically structured correctly. As a result, the codes 'query-completion' for the initiative role and 'reply-completion' for the respondent role were included in the coding scheme.

An additional code was introduced as a result of observed AS behaviours. One participant requested help repeatedly from the NS in accessing the device or if they did not understand. This request was made through vocalisation and eye gaze, but was recognised as a method of requesting help, as the NS would use a check question to make sure this was the purpose of the utterance. Consequently, 'Request for help' was added to initiation type moves.

As discussed, the pilot data led to several developments in the coding structure. However, these data were only collected from one participant. Within the full study, participant demographics included different developmental



conditions to those of the pilot participant. One participant had a diagnosis of Autistic Spectrum Condition (ASC) and another had a congenital disorder that shared features of an ASC. Data collected from these two participants included two categories of activity that did not fit into any of the previously developed codes. Both participants with ASC presentations would lose focus and start to press buttons on their devices repeatedly. These AAC-encoding moves were not related to their narrative or in response to an NS initiation. Due to the fact the participants were not actively communicating with the NS during habitual access of the AAC device, the category of 'No Communicative Function' was created. Within this category the code 'operation of device – other' was introduced to signify the non-communicative accessing of an AAC device as described above.

One other code was included in this category: 'repetition'. This code was used to represent instances in which a participant automatically repeated a word produced either by the NS or the AAC device. 'Repetition' was coded as long as the utterance was made with no questioning/rising intonation that could have suggested a 'check' move. This was considered a non-communicative move as both participants demonstrated this behaviour as a habitual act. A summary of the final linguistic move-type coding structure is shown in table 3.6.3a on the next page, full definitions are provided in appendix B11.

<b>Linguistic Move-Type</b>	<b>Code</b>
<b>Preparation</b>	
Ready	R
<b>Initiation</b>	
Instruct	I
Explain	Ex
Inform	In
Check	C
Align	AI
Query-YN	QYN
Query-W	QW
Query-Choice	QCH
Query-Completion	QC
Request for help	RH
<b>Response</b>	
Acknowledge	A
Object	O
Reply-Y	RY
Reply-N	RN
Reply-W	RW
Response to instruction	RI
Reply-Choice	RCH
Reply-Completion	RC
Clarify	CI
Praise	Pr
Comment	Co
Summarise	S
<b>No Communicative Function</b>	
Operation of device-Other	OD
Repetition	R

Table 3.6.3a Final linguistic move-type codes and abbreviations

*Linguistic complexity:*

To increase the depth of the analysis and examine the linguistic complexity of the AS' narrative productions, type-token ratio (TTR) was introduced as an outcome measure. Type-token ratio (TTR) was developed by Johnson (1944) as a measure of vocabulary diversity in spontaneous language samples. TTR is a ratio of the number of different words (types) to the total number of words (tokens) used within a sample. Calculations are completed by counting the total words used; contractions and negative contractions are both counted as one word. The Total number of different words is also counted and then divided by the total number of words in the sample to obtain the TTR.

Templin (1957) investigated the use of TTR as an index of linguistic development in a sample of 480 children aged three to eight years. Despite an increase in both the number of different words and number of total words in conjunction with increased age, a TTR of around 0.50 (1:2) was consistent across

all age groups and was not affected by gender or socioeconomic status. In more recent studies, TTR has been stated as a crude measure (Fletcher, 1985, Perkins, 1994) due to the fact it is affected by the size of language sample from which it is calculated. However, a TTR that falls well below 0.50 may still identify possible restrictions in the vocabulary being used. To counteract the issues of language sample size Fletcher (1985) suggests a sample of at least 100 words. This recommendation was increased to 250 – 350 words by Perkins (1994) in a study of repetitive language. The current study aimed for a minimum 100 word sample for TTR calculation to meet the Fletcher (1985) recommendation.

Independently to TTR, total number of words (NTW) and number of different words (NDW) are both measures frequently used to measure linguistic diversity and have been employed in AAC research to investigate child language samples (Soto et al., 2009). By making use of TTR it is possible to present NTW, NDW and TTR potentially providing a more in-depth analysis of the interaction. There are currently no standardised norm NDW and NTW values available for narrative interaction. Therefore the use of TTR enables some comparison to a norm value that would not be possible if NDW and NTW were the only measures in use. Comparisons were however made with caution as Templin's (1957) study did not include any participants with developmental conditions.

To provide further detail of linguistic complexity in the narrative productions, the frequency of both content and function words was also calculated. Function words were defined as: a word that has little or no meaning apart from its grammatical expression and content words as: a word that conveys meaning in an utterance, most often a noun, verb or adjective (Thompson, 1995). When presented alongside the TTR, this produced an in-depth observation of the linguistic complexity of the narratives produced. This is a previously under-researched area in children using AAC devices.

#### *Communicative Modality:*

Throughout initial coding of the pilot data certain areas of communication were still being neglected. The coding structure employed during the pilot study (shown in table 3.6.2a) was found to include codes that were too ambiguous to ensure good reliability. For this reason further adaptations were made to the structure. Eye contact and gesture were the predominant factors in coder

disagreements during discussion and development by the researcher and primary supervisor. These codes were therefore modified and redefined to provide more distinguishable categories (see Table 3.6.3b)

<b>Communicative Modality</b>	<b>Code</b>
Speech	Sp
Vocal Gesture	V
Co-Action	Ca
AAC-Encoding	AACE
AAC-Output	AACO
Eye Gaze:	
Eye Gaze Person	EP
Eye Gaze Device	ED
Eye Gaze Other	EO
Facial and Body Gesture	G
Sign	S
Environmental Reference	Env
Not Possible to Code	NPC
Neutral	N

Table 3.6.3b Final version of communicative modality coding structure

As shown in table 3.6.3b, eye contact was divided into three coding categories to improve the accuracy of coding. Despite high quality video recordings and data from two video cameras, it was not possible to consistently identify the direction of eye gaze. These categories were therefore redefined to incorporate instances in which a participant's head direction and (if visible) eye gaze indicated they were looking at the other conversation partner, the AAC device or something else, e.g. the fictional narrative stimuli. Shared attention was removed from the coding structure because it was not possible to distinguish between joint eye-gaze or actual shared attention.

Once these developments had been implemented, the researcher re-coded the pilot data and felt increased confidence in the coding structure. At this point a reliability study on 30% of the pilot data was completed with the primary supervisor as second coder using the framework in table 3.6.3b. A Cohen's Kappa co-efficient produced a value of  $K=0.73$  which suggests a good level of reliability between coders according to Fleiss (1981) interpretation. To further increase the reliability of the coding framework all coding disagreements were discussed by the researcher and primary supervisor to identify causes of ambiguity. The only code requiring adjustment was AAC-encoding as the

definition was not clear enough to ensure consistent inter-rater reliability. The researcher and primary supervisor therefore agreed a more precise definition. For the full list of codes and definitions for each modality see appendix B12.

### 3.7 Data Collection

#### 3.7.1 Setting

Data collection took place in a quiet, familiar room within the participants' school to minimise distraction and reactivity to the environment. All the rooms used had a good light source to provide optimal visibility of the communication aid's display and the stimuli for the research tasks. The environment was set up as per the diagram provided in figure 3.7.1a. This room set up was selected through a 'proof of concept' whereby a number of potential set-ups were tested for both recording quality and ease of interaction by the researcher and a volunteer. A laptop was used to represent a communication device in order to determine optimum positioning of the second camera as it was necessary to capture the device screen for later analysis. Due to the participation of two children in wheelchairs during these interactions the table shown in figure 3.7.1a was replaced by their wheelchair trays.

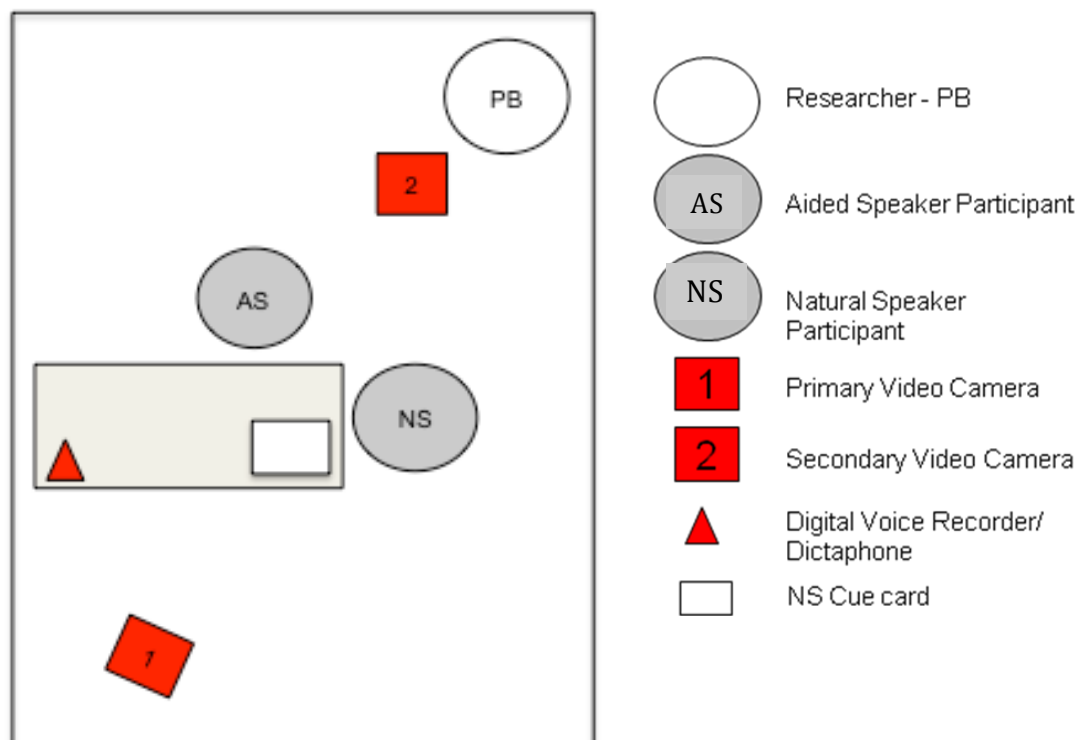


Figure 3.7.1a Research environment set-up as tested via proof of concept

The researcher assumed the role of 'marginal participant' and was positioned behind the participants. The researcher took no part in the ongoing action, although participants were aware of her presence (Robson, 1997). Maintaining this role and position in all data collection sessions helped to minimise the effect of the researcher's presence on the proceedings. This enabled the collection of data that was a realistic portrayal of narrative interaction between teaching staff and pupils who use AAC. Removal of the researcher was not ethically viable as observing to ensure the participant's comfort was a vital part of the researcher's role. The NS was requested to focus on the narrative tasks set; it was therefore not realistic to expect them to also continuously monitor the AS's comfort.

### **3.7.2 Participant Demographics**

A total of seven participants were recruited. However, three of these either withdrew or were excluded from the study for the following reasons: one participant was found to be unsuitable as she was most confident in using a particular AAC device that did not meet the criteria (GoTalk 20+, mid-tech device); one teaching participant dropped out due to ill health; and one teaching participant did not feel they knew the AS well enough to complete the tasks despite meeting inclusion criteria.

This provided a total of four participants, three male and one female, described as AS and their corresponding teaching staff (all female). All AS and NS participants spoke English as a first language. AS participants had a range of medical diagnoses that affected their need of AAC: Participant B and S had a diagnosis of cerebral palsy of different types. Participant J had a diagnosis of Autistic Spectrum Condition (ASC) and Participant O had an unspecified congenital abnormality with behavioural features similar to ASC. Their age ranged from 7:11 years to 12:08 years.

The AS participants used different high tech communication aids; although, these were all based around a tablet personal computer (PC) and were similar in their primary function as a communication aid. Four months was the minimum amount of time spent using the AAC device before the first data collection session (Participants J & S). Participants had a range of expressive and receptive

language ability, but all teachers were confident that each participant would be able to complete the data collection tasks without any undue stress. A summary of participant demographics is shown in table 3.7.2a; for detailed AS participant information see the table in appendix B8.

<b>AS Participant (corresponding NS)</b>	<b>Age (at first data collection)</b>	<b>Primary Diagnosis</b>	<b>AAC Device</b>
B (NS1)	10:11	Athetoid CP	Dynavox MT4 – direct access with Keyguard
S (NS2)	12:08	Spastic CP	Powerbox 7 with Alea Intelligaze – Access - eye gaze
J (NS3)	7:11	ASC	Tellus Mobi – direct access
O (NS4)	9:06	Chromosomal abnormality (presenting similarly to ASC)	Samsung NP-Q1 Ultra with Q-talk software – direct access

Table 3.7.2a Summary table of AS participant demographics

The NS participants had all worked with children with SEND for at least nine years, suggesting they were very experienced in this field. However, for three teaching staff this was the first child they had worked with who used a high-tech communication aid. Therefore, despite experience with SEND and AAC in different forms such as signing, symbols and low tech devices, they were relatively inexperienced in the use of aided communication. When asked, they all stated they were confident in interacting with the AS participant and use of the device. A summary of NS participant information is shown in table 3.7.2b; for detailed NS participant demographics see appendix B7.

<b>NS Participant (AS)</b>	<b>Position Held</b>	<b>Experience Working in SEND</b>	<b>Total Time working with AS Participant</b>
NS1 (B)	Class Teacher	17 years (No previous high-tech AAC experience)	6 months (2 terms)
NS2 (S)	Communication Specialist Teaching Assistant	9 years (6 years AAC experience)	3 years
NS3 (J)	Class Teacher	16 years (No previous high-tech AAC experience)	4 months (1.5 terms)
NS4 (O)	Class Teacher	20 years (No previous high-tech AAC experience)	2 years

Table 3.7.2b Summary table of NS participant demographics

### 3.7.3 Data Collection Materials

Past observational and intervention studies have shown successful fictional narrative elicitation through the use of wordless picture book stimuli (McCabe et al., 2008, Soto and Hartmann, 2006). The feasibility of this method was also shown in the pilot study (section 3.6.2), in which a wordless picture book was used to elicit a fictional narrative under the pilot research conditions. Therefore this was decided to be an effective method of elicitation for this research.

Three picture books from commonly used speech and language therapy assessments were selected as stimuli for fictional narrative elicitation. By using stimuli that were produced for the same purpose, as assessment material, all had a similar basic story structure involving an introduction, single high point and resolution. Each stimulus was also produced for a validated age group. It was therefore possible to select picture books that were similar under this criterion. It was hoped that by using books from validated assessments, on dissemination of the study, speech and language therapists would be familiar with the materials. The three most similar picture books available were *The Squirrel Story* (Carey et al., 2006) *Peter and the Cat* (Leitao and Allen, 2003) and *The Bus Story* (Renfrew, 1991) see appendix B13 for comparisons.

As four data collection sessions were completed by each participant, one narrative stimulus had to be used twice because it was not possible to find another picture book similar to the three already selected. *The Squirrel Story* was therefore used twice at the first and last data collection sessions, twelve weeks apart. A minimum re-test period of ten weeks was suggested by the publishers of this picture book (Carey et al., 2006). Therefore, any bias through learning of the task should have been minimal.

The stimuli selected for personal narrative elicitation were also taken from past research. Allen, Kertoy, Sherblom and Pettit (1994) produced a list of topics for personal narrative elicitation, later used by Goldman to elicit personal event narratives from autistic children (Goldman, 2008). However, the topics centred on personal events relevant to American children. The four topics felt to be most



relevant to British children were therefore selected. These topics were: a Christmas, a Birthday, pets and your first day at school.

Prior to each session, vocabulary sheets were provided to teaching staff for programming onto the AS's AAC device (see appendix B14). NS participants were asked to look through the vocabulary with the AS before each data collection session so they were familiar with this.

The topics were presented in the same order (see table 3.7.3a). As a contingency, if the child was unable to produce a personal narrative on the given topic, a relevant alternative from the Allen et al. (1994) list would be offered; however, this did not occur during data collection.

<b>Session</b>	<b>Narrative Stimulus</b>	
<b>Data Collection</b>		
<b>Session 1</b> 0 months	The Squirrel Story	A Birthday
<b>Data Collection</b>		
<b>Session 2</b> (within 1 week of session 1)	A Christmas	The Bus Story
<b>Data Collection</b>		
<b>Session 3</b> 3 months	Peter and the Cat	Pets
<b>Data Collection</b>		
<b>Session 4</b> (within 1 week of session 3)	First Day at School	The Squirrel Story

Table 3.7.3a: Order of stimuli for each data collection session

An A4 size cue card was also placed on the table near the NS participant (Appendix B10). The cue card comprised bullet point instructions reminding the NS of the structure of the session. This card was introduced during the pilot and was reported to be useful for reassuring the NS. It also facilitated consistency in data collection sessions across dyads. This increased the researcher's ability to maintain the role of marginal participant, as NS partners were confident in how to

initiate and complete each narrative task and move from one task to the next. Details on the cue card are shown in appendix B10.

### **3.7.4 Recording medium**

The following video capture equipment was used to record data during all data collection sessions: 1 Panasonic NV-GS320 Digital video camera, 1 Panasonic NV-GS230 Digital video camera, two tripods and one Raynox 0.5x super wide angle lens attachment. All data was recorded onto Maxell mini digital video cassettes (LP:90).

The two video cameras used in data collection captured different aspects of the interaction. One was positioned in front of the participants to capture the interaction as clearly as possible; the second was placed behind the participants to capture what was on the communication device screen and the participants' access of the device. This second camera was also used to confirm hand gesture, direction of eye gaze and any other communication modalities seen from this other angle.

Separate digital audio recordings were made using a Sanyo ICR-A190M Digital audio recorder to ensure quality audio and visual data was captured. A digital recorder was placed on the table with the integrated microphone towards participants (see Figure 3.7.1a). The digital recorder was able to capture high quality audio data without causing further reactivity due to the device being small and discreet. Audio data captured was used during transcription to check audio recordings provided by the video cameras, increasing accuracy of final transcriptions and resulting analysis. The software - Adobe Premiere Elements 4 was used to edit all video and audio data collected, in order to provide the narrative sample to be analysed.

### **3.7.5 Data Collection Procedure**

Once consent and initial meetings with the NS participant had been held, the researcher provided relevant vocabulary lists for the narrative tasks in the first and second data collection sessions, so that the communication aid could be programmed in advance. Another vocabulary list was provided at the end of the

second data collection session. Thus enough time was given to programme the device whilst also not overloading the NS with all the vocabulary at once. Vocabulary lists consisted of sub-categories of objects/character, actions and descriptions. The vocabulary for fictional narratives was taken from the example narratives provided for each story in the related assessment manuals. Personal narrative vocabulary sheets were created from common themes and objects that are usually discussed in relation to the selected topics. Ideas were also taken from the examples of narratives provided in the publications from which the narrative topics were taken (Goldman, 2008, Allen et al., 1994).

At the start of each data collection session the researcher checked the AS participant's home-school communication book and spoke to teaching staff to ensure no seizures or other medical issues had occurred overnight or during that day that may have affected their participation. The participants were then positioned in the research environment (see figure 3.7.1a).

Once both participants were comfortable in the research environment, the researcher, NS and AS looked through the accessible information sheet (appendix B3). Informed agreement was then solicited from both participants. This was completed at each session to ensure all participants' willingness to take part at that time. If at this point the participant had not been willing to take part, data collection would have been attempted on another occasion during that week. If the participant refused to take part twice they would have been withdrawn from the study. Participants were also reminded that they were able to stop data collection at any point. Data collection was only terminated once for one participant due to fatigue. Other participants chose to take a break in between narrative tasks for a drink or food, data collection then continued once participants were ready.

Once all participants had agreed to complete the task, the researcher informed the NS of the stimulus for the personal narrative task and ensured the correct fictional stimulus and cue card were on the table. The NS was also instructed on the order in which the narrative tasks were to be completed. The researcher then switched on all recording equipment, informing the participants of this process as it was carried out. Once all equipment was turned on the

researcher checked that the shot being recorded from each camera would capture all of the interaction successfully and then sat down in position.

Prior to beginning the narrative tasks, the NS and AS held an informal conversation in which the NS briefly introduced the tasks to be completed. The purpose of this conversation was to allow both participants to become used to the recording equipment and therefore limit camera reactivity as far as possible. The NS began the narrative tasks as described below in the order previously stated.

The procedure for fictional narrative elicitation was the same as for the pilot study, as this had successfully produced fictional narrative interaction. Firstly, the NS and AS looked through the picture book together. The NS made comment on any relevant characters and plot lines thought important in enabling the AS to retell the story. Once the book had been completed, the NS asked the AS to retell the story using a phrase similar to “Now can you tell me that story using the pictures”.

The Personal narrative task was introduced by the NS using the phrase “I’m going to tell you a story about (given subject) then I’d like you to try and tell me one” or equivalent. At this point the NS then told a short personal narrative on the topic provided by the researcher. The NS had been instructed to keep this story simple and understandable to the AS. Once they had completed their story the NS then asked the AS if they had a similar story they could tell. If the AS responded positively they were then encouraged to tell this story. This was captured as the personal narrative sample. If the child had answered no, a second topic would have been offered by the NS, again providing an example and then asking the participant to tell a similar story.

Once the AS appeared to have finished their narrative the NS asked “is that everything?” or equivalent, e.g. “have you finished?”. If at this point the child continued, the NS was allowed to repeat this prompt once more before assuming the AS had finished the next time they stopped producing AAC output. By checking the participant had finished their story, it was ensured that no narrative was interrupted by an NS assumption or communication breakdown.

On completion of the tasks, the NS provided positive feedback in relation to what had been produced throughout the session. Once praise had been received the researcher switched off all recording equipment and participants were informed that data was no longer being captured. The researcher thanked both participants and also provided positive feedback to the AS, ensuring they left feeling confident about the research process.

### **3.8 Data sampling**

#### **3.8.1 Camera reactivity**

Camera reactivity in observational research has been linked to possible increased self-awareness and anxiety when a camera is present (Levander, 2002, Penner et al., 2007). A heightened inner self-awareness and anxiety is also linked to a person's external behaviours. Many situations and circumstances are known to increase self-awareness, for example public speaking (Levander, 2002); however, the presence of a camera may also have a similar effect (Buss, 1980).

Buss (1980) found that the presence of mirrors and cameras could have an effect on a person's level of self-consciousness. However, the actual effects of these various modalities on behaviour and self-consciousness remain uncertain, as other studies have returned results suggesting minimal reactivity. For example, Carpenter and Merkel (1988) found no difference between participants' reactions or self-consciousness to the use of audio recording, one-way mirrors and video recording during an investigation into couple interactions under different observation environments. Through a study of anxiety levels in response to audio and video recording, Lichton and Waehler (1999) noted that no significant differences in anxiety levels were found between the recording modalities. However, it was identified that during the study the physical visibility of the recording equipment was low, which may in turn have decreased the effects of the recording equipment on anxiety (Lichton and Waehler, 1999).

Several studies have considered behavioural changes in relation to video capture within medical interactions. The main aim of these studies was to evaluate success of interaction and patient satisfaction; however, they also considered camera related behaviour within the research. Coleman (2000) identified that although video recording was practical for capturing all aspects of

doctor-patient interactions, it was stated that participants might alter their behaviour due to the influence of a camera. It was also noted that the use of a camera may affect internal validity, as participants may behave in an 'atypical' manner (Coleman, 2000).

A recent study by Penner et al. (2007) also examined camera-related behaviours in medical interactions with the use of concealed video cameras. Through examination of the interactions of forty-five patients it was found that camera-related behaviours occurred in the interactions of thirty-four of the participants. This study established that the majority of behaviours occurred during the early stages of the interactions, after which participants appeared to acclimatise to the camera's presence (Penner et al., 2007). This may suggest a link to the factors of self-awareness raised earlier, as self-consciousness and anxiety are more likely to be heightened by the existence of the video camera at the initial stages of the interaction (Nezlek, 2002). Penner et al. (2007) also stated that video recording, in comparison to audio recording, is a more reactive and intrusive method of observation, which in turn could therefore heighten anxiety and alter behaviour.

### **3.8.2 Camera reactivity and the present study**

Due to the previously evidenced multi-modal nature of interaction between NS and AS, video recording was essential to ensure all non-verbal communication was captured. As two video cameras were used, one of which being in a prominent position in front of participants, it was important to ensure camera reactivity was limited as far as possible. One strategy employed was the use of an introduction and informal conversation at the beginning of each data collection session. This informal interaction occurred once the researcher had informed participants the recording equipment had been switched on at the start of data capture. As indicated from the literature, the majority of camera-reactivity occurs at the beginning of an interaction and therefore this informal conversation and introduction of tasks was excluded from the analysis. In this way, the potential for camera reactivity was controlled.

A familiar room in the participants' own school was used as the research environment. This room was made as comfortable as possible with good natural

light sources, temperature control and low levels of ambient noise. The familiarity of the participants to each other should also have limited levels of anxiety in comparison to interaction with an unfamiliar partner. Alongside this, the fact that the researcher met the participant at least once prior to data collection sessions and remained at the back of the research environment also helped to limit any anxiety or resulting reactivity.

### **3.9 Data Analysis**

#### **3.9.1 Transcription and Linguistic Move Type**

All data were transcribed into standard orthography following an adapted version of the Von Tetzner and Jensen (1997) conventions, shown in appendix B9. Repeat viewings using pause and playback functions were completed to capture both verbal and non-verbal aspects of the interaction. Once a draft transcript was completed, this was amended following further review of the video until all communicative acts had been captured and the researcher felt this represented an accurate account of the interaction. The transcription of non-verbal communication was vital due to its high usage by some participants. Transcription of non-verbal communication also ensured the multi-modal nature of NS:AS interaction was captured.

Once transcribed, each narrative was coded using the linguistic move-type codes developed in the pilot (p.78). Codes were handwritten onto the transcripts next to each linguistic move. Once checked, codes were then entered onto an electronic version of the transcripts. Transcripts were coded alongside playback of the video recordings to ensure accuracy of coding at all times. Use of video playback was vital in ensuring vocalisations or unintelligible speech made with linguistic purpose could still be coded. If required, intonation was used in these cases to identify the linguistic move-type in use. For example, questions commonly end with a rising intonation. The interactional context surrounding a vocalisation or unintelligible speech was also used in order to code these more complicated moves.

#### **3.9.2 Linguistic Complexity**

In order to calculate TTR values, each new word produced by the AS during narrative elicitation was written onto a list. This provided the number of

different words per narrative, which were added together according to narrative condition to provide the total different words for each narrative type. Frequency of use per word was then calculated by re-reading the transcript alongside use of a paper tally chart. This produced the total different words used per narrative, which were again totalled for each condition for use in TTR calculation.

To calculate TTR the number of different words (types) was divided by the total number of words used (tokens). To increase accuracy of this measure it has been suggested that the number of total words in a sample should total more than one hundred (Fletcher, 1985). For this reason TTR was only calculated using the total number of words and total different words used across all four data collection sessions for each condition. This meant that in all but one case, samples were over the minimum one hundred word recommendation; ensuring use of this measure was appropriate.

The word lists created during TTR calculation were used to identify content and function words. Using the definitions provided in section 3.6.3, the frequency of content and function words were calculated for each AS narrative production. In order to enable comparison across narrative conditions the total number of content words and function words across the four data collection sessions was also calculated.

During the analysis of linguistic complexity, the researcher identified the use of stored phrases by two AS participants. In order to control for this, word lists provided for use in narrative construction had only contained single words. However, the two participants employed pre-existing pages on their AAC devices that contained stored phrases to provide narrative information. The researcher decided all words produced were to be counted individually, including those given as part of a stored phrase. For example the phrase 'my Mum is called' was counted as four words although produced by a single AAC selection. The selection of the stored phrases required a considerable increase in navigation of the AAC device; i.e. the AS had to make additional AAC access moves to navigate dynamic pages in order to select the stored phrase. Therefore, a comparative effort was made to produce the four word phrase and the single word outputs within the pre-programmed narrative pages.



Pre-stored phrases had a greater function word content than single word selections from the communication aid, as they were pre-programmed by the NS. This therefore impacted on the analysis of content word and function word use. Re-reading of the full transcripts was employed to review the use of stored phrases and the function word content of the phrases recorded. Due to the minimal recorded instances of stored phrase use it was felt this did not have a significant impact on the current findings. Therefore, analysis of words produced within stored phrases was continued, alongside single word AAC productions. This is discussed further in Chapter Six (Discussion; Limitations) as an area for consideration in future research.

### **3.9.3 MTS and Communicative Modality**

In order to complete the MTS analysis on the data, a bleep had to be superimposed onto each video recorded interaction at ten second intervals. Ten seconds was selected for the MTS interval because communication represents a dynamic process of rapidly changing communication behaviours. An early concern was employing suitably frequent intervals in order to limit compromise of captured behaviours. The indication of each ten second interval was done by creating a bleep track using Adobe Audition on which a frequency was created and repeated at the end of every ten second interval. Once saved as a sound file, this bleep track was then added onto the video recordings using Adobe Premiere Elements 4.0. The bleep tracks started at the point at which the narrative interaction between the interlocutors commenced. It stopped at the termination of the story after praise had been given by the NS following the procedure in section 3.7.5.

To provide a clear view of the interaction for coding, the video data from both camera shots were edited together to show picture-in-picture using the software package - Adobe Premiere Elements 4.0. This enabled the researcher to see both camera angles at one time. By using picture-in-picture the researcher was able to see both the face to face interaction as well as the screen of the communication device. This ensured coding of 'AAC-encoding' was accurate as selections could clearly be seen on the device. This was vital for analysing data from Participant S who used eye gaze for access. Without the availability of picture-in-picture, 'AAC-encoding' may have been misconstrued as 'eye gaze-

device' if only a front view of the device was available. Using the view of Participant S's screen it was possible to code the modalities correctly as symbols became highlighted on the device when being selected. Once the video-editing process had been completed, files were saved as .avi encoded files to enable playback of the video and sound track simultaneously.

Each narrative was watched and coded using a paper check sheet on which each category was represented in a column, with rows representing each moment sampled. At each bleep, a coding decision was made for the observed behaviour by inserting a tick into the appropriate box. To ensure accuracy of coding, repeated viewing of the video clips was conducted. Each narrative was coded using the piloted categories for communicative modality (appendix B12).

To ensure consistency throughout the analysis, a guidance sheet summarising the rules for administration was created (appendix B16). Due to the complexity of coding all types of 'eye-gaze' it was agreed that: if a participant was in the process of switching their gaze direction when a bleep was heard then both the initial and final positions of gaze would be coded. This increased the likelihood of reliability across coders when later tested. Once the researcher had coded the data they then checked it again on at least one other occasion to ensure intra-rater reliability.

### **3.9.4 Integrated Profile of Narrative Construction**

Review of the full transcripts was completed to identify any patterns of correspondence between communicative modality and linguistic move-type. This was to examine the mutual contributions of the interlocutors to the narrative construction. Full transcripts were re-read and annotated to highlight the use of communicative modalities in close proximity to linguistic move-type. This process was completed twice, once to examine the moves and modalities employed by the NS and once to study those employed by the AS. The annotations produced were reviewed in order to identify any common pairings of communicative modality and linguistic move-type.

Initially, the linguistic moves employed were considered as part of the narrative discourse structure i.e. within the categories of preparation, initiation or

response moves. Clarke and Kirton (2003) completed a similar analysis during a study of AS-peer interaction. Their findings showed children who use AAC made the majority of response moves through the use of gesture and vocalisation, and initiation moves through the use of their AAC devices. The current study therefore aimed to identify whether the link between modality and linguistic move use, identified by Clarke and Kirton (2003), was present during narrative construction. Inspection of these two major levels of analysis (discourse structure and communicative modality) independently, also highlighted the need to examine their correspondence within the narrative interaction. In turn, this allowed narrative interaction to be observed as multi-dimensional rather than a series of unitary measures.

Analysis of the NS' role in AS narrative interaction has received limited attention in research. The analysis of discourse structure and communicative modality therefore enabled greater depth of analysis and resulting insight into the moves made and roles played by the NS. Light et al. (1985c) suggested that an interlocutors' modality use may influence the communicative acts completed by the conversation partner. The inclusion of an integrated profile of the narrative interaction incorporating both outcome measures allowed the investigation of whether this influence was also present in the linguistic moves employed through use of individual communicative modalities. It also allowed identification of whether similar instances of co-occurring linguistic move-types and communicative modality use were evident between NS and AS participants. It was felt this would provide an integrated appraisal of the narrative interaction, bringing together two salient pieces of the interaction; linguistic moves and communicative acts.

### **3.10 Reliability**

To check intra-rater reliability, the researcher checked all codings of communicative modality and linguistic move-type for all recorded data through simultaneous review of the video data and coding sheets. If the researcher disagreed with her original coding, that moment of data was reviewed and coded at least two further times. Only minimal re-coding was completed during this process. Intra-rater checks were completed before a full reliability study was completed for inter-rater reliability between the researcher and a secondary coder.

The inter-rater reliability study was completed on 30% of the data collected in both the pilot and full study. The researcher's Primary Supervisor completed second coding of the 30% reliability sample. Full code definitions, summary sheets and coding rules were provided to the second coder (see appendices B11, B12, B15 and B16). Practice sessions were held prior to the completion of both inter-rater reliability studies, in which short sections of data were coded by both coders. Findings were then compared and any disputes were discussed. Prior to the coding of the full study data a second training session was held. During this session developments to the coding structures and rules were discussed and practice coding was again completed on samples of full study data.

In both the pilot and full study, reliability data were randomly selected for re-coding. In order to provide 30% of all data collected from the full study the total length of interactions was calculated in hours:minutes and then 30% of this value was taken. The total interaction time across all participants and sessions was 5:07:51. Thirty percent of this total was then calculated, giving a total of 1:33:00 to be coded in the reliability study. Each narrative interaction was numbered and random number generation was used to select narratives to be re-coded until a sample totalling one hour and thirty-three minutes was reached. In total nine narratives from across all four participants were selected. This procedure limited any potential bias or the opportunity for purposive sampling by the researcher.

Once the data had been re-coded the findings were entered into confusion matrices. A Cohen's Kappa co-efficient was performed for each of the coding structures to provide a Kappa (*K*) value of inter-rater reliability. Fleiss's (1981) interpretation was used for the level of reliability, i.e.  $K=0.00-0.39$  demonstrates poor agreement,  $K= 0.40-0.59$  shows fair agreement,  $K=0.60-0.74$  is deemed good and  $K= 0.75$  or above indicates an excellent level of reliability. The Kappa values from the pilot and full study data are shown below in table 3.10a.

<b>Study</b>	<b>Communicative Modality</b>	<b>Linguistic Move Type</b>
Pilot	$K = 0.73$ (good)	$K = 0.55$ (fair)
Full Study	$K = 0.29$ (poor)	$K = 0.48$ (fair)

Table 3.10a Cohen's Kappa Co-efficient reliability figures for communicative modality and linguistic move-type outcome measures

Pilot data consisted of one participant; therefore it is felt the introduction of three other participants, with variable presentations, may have caused the disparity between pilot and full study reliability scores. Due to the poor reliability between coders for the communicative modality outcome measure, it was decided that further training and definition of codes was required. Two further training sessions were held, in which coders re-coded sample data together and discussed any disagreements as these occurred. The codes that resulted in the highest number of disagreements were those relating to eye gaze. This may be accounted for by the difficulty of viewing participants' precise gaze, as this was the subtlest of modalities recorded. The high frequency of eye gaze use may also have increased the frequency of discrepancies. Following training sessions, the 30% sample of full study data was re-coded by both coders. The re-coded data was then re-analysed using the Cohen's Kappa co-efficient providing a score of  $K=0.66$ . This shows good agreement according to Fleiss (1981).

As a result of the notable improvement in reliability score after re-coding the 30% segment, it was suggested that the researcher re-coded all data in order to ensure validity of the findings. Another 30% of the data was re-coded by the researcher. However, when intra-rater reliability was checked between initial and secondary coding only minimal differences were found. A Kappa co-efficient was completed between original and re-coded data from the researcher. This showed excellent intra-rater agreement between initial and second coding ( $K = 0.89$ ). The remaining 40% of data was therefore not re-coded.

Not enough clarity in definition of codes and rules of coding are most likely to be responsible for the disparity between initial coding and re-coding of the 30% sample. The coding system was developed by the researcher, who also had more personal knowledge and opportunity to tune-in to the idiosyncrasies of the participants' verbal and non-verbal behaviours. Therefore, the primary researcher was able to achieve higher intra-rater reliability between codings more easily. The considerable amount of data being coded by a single researcher increased the potential for observer bias. The limitations of this and resulting considerations for future research are discussed in Chapter Six.

The 'fair' level of reliability recorded for the coding of linguistic move-types may be accounted for by the large number of codes employed. This number was necessary to provide an in-depth examination of the narrative interactions that occurred. However, a number of codes shared similar features, which led to some discrepancies between coders. For example, despite definitions being improved following the pilot, 'comment' and 'acknowledge' were the codes that caused the most disagreements between coders. Furthermore, at some points in the interaction, AS communication was also difficult to understand due to the use of idiosyncratic gesture and poor speech intelligibility. This meant context and features such as intonation had to be used in order to determine the appropriate code for some linguistic moves, again increasing the likelihood of coder disagreement. Due to the complex communicative style of children who use AAC, a certain level of disagreement was likely to occur. Codes were developed and defined as well as possible within the time constraints of the PhD and therefore a 'fair' level of inter-rater reliability was accepted. This is discussed further in the critique of the study (p.230).

### **3.11 Statistical Analysis**

Inferential statistics were not completed on the data due to the small sample size ( $n=4$ ) and the risk of Type 1 and Type 2 errors occurring. Therefore, descriptive statistics were applied to provide as complete an analysis of the data as possible. Once all the data had been collected, the following descriptive statistics were produced across the four data collection sessions and two narrative conditions. The sum of each individual code and total across the four data collection sessions was calculated. Mean, as the strongest measure of central tendency, was used to inform the average scores across the four data collection sessions, supplemented by mode. Due to the fact the linguistic performance of the interlocutors varied across the data recording sessions, minimum and maximum values were included, with range calculated to capture the difference between these two figures. Percentage of the total was calculated so that relative proportions of communicative modalities used by any one interlocutor could be compared and so that comparisons could be drawn directly between the interlocutors in any one dyad. Graphic representations were also produced in order to indicate the spread of communicative modalities in use and those showing most frequent use in the interactions.

### **3.12 Summary**

In summary, this chapter has presented the study design and the methodology that has been developed in order to meet the study objectives and research questions. The rationale for the methods in use has also been presented to ensure a robust and credible methodology was used. Alongside this, MTS has been introduced as a novel systematic methodology for coding interaction in speech and language therapy research. This methodology will be further explored in the following chapter, which details a feasibility study that was completed to calculate the accuracy of different time intervals in use with MTS.

## Chapter Four

### Momentary Time Sampling – A Reliability Study

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#### 4.1 Introduction

This chapter presents a subsidiary study investigating the momentary time sampling methodology. The chapter stands as an individual paper and details the background to the study, methodology used, findings and discussion of the results in relation to past research. As a significant part of the methodology of the main study, it was felt that the reliability of MTS should be investigated. Previously MTS has been primarily used in psychology and behavioural research and, therefore this study aimed to identify its efficacy in the study of interaction and communication behaviour.

#### 4.2 Background

##### 4.2.1 Momentary Time Sampling

Momentary time sampling (MTS) was originally developed as an efficient method for measuring specific behaviours during general activity (Bindra and Blond, 1958). It is a systematic observation method in which the occurrence or non-occurrence of target behaviours is coded at the end of a pre-specified time interval. This provides a yield of the proportion of total time spent in any of the target behaviours. Since its' development, MTS has been used extensively in the fields of psychology and human and animal behavioural research. By coding interactions at time intervals, this method enables the analysis of large quantities of data more efficiently than real-time coding. However, as coding is not completed in real-time, some questions have been raised about the accuracy of MTS.

A seminal paper reporting the accuracy of MTS is that of Brulle and Repp (1984). The authors aimed to identify the reliability of different time intervals used in applications of the MTS methodology. Five, thirty-minute observations were made of one child using an event-recorder, through which the researcher



recorded the duration of a behaviour by depressing a button. Five behaviours were coded during the observation. These were: reading, listening/participation, inappropriate non-disruptive, disruptive and absent. Once data were collected, the report from the event-recorder was sampled at 10, 20, 30, 60, 120 and 240 seconds. Data were also sampled with delays of 0, 12, 24, 36 and 48 seconds. This sampling strategy using all possible combinations of varying interval and delay produced a total of 750 samples for analysis. Sampling was completed by two independent observers, producing no disagreements and therefore a reliability score of 100%. The proportion of time each behaviour occupied was calculated for each sample. Proportions were then averaged and a binomial test was completed to test for over and under-estimation.

No significant differences in over or under-estimation were found at 10, 20, 30 or 60 second intervals. However, at both the 120 and 240 second intervals significant over and under-estimation was identified. This suggests these intervals are too large to accurately capture the time spent carrying out a particular behaviour. At the ten second interval, one hundred out of one hundred and twenty-five observations were within one percentage point from the standard. All observations at the ten second interval were within four percentage points of the standard, showing a high level of accuracy. Data coded using a twenty second MTS interval showed a similar level of accuracy, with all one hundred and twenty-five observations being within six percent of the standard. A negative correlation was seen between increasing time intervals and accuracy of coding. For this reason, Brulle and Repp (1984) suggested that MTS was accurate in providing a proportion of total time spent carrying out a coded behaviour when using ten or twenty second intervals.

Some limitations of the Brulle and Repp (1984) study have been identified. Data were initially grouped into the sub-categories of under-estimation, over-estimation and equalities. Instead of analysing the data within these three sub-groups, however, two groups were created by adding data from the equalities sub-group into the smaller of the over-estimation and under-estimation categories. This limits the interpretation of the findings, as the data analysed were no longer representative of the data collected. Despite these constraints to the findings, this paper makes a substantial contribution to the research evidence-base of the MTS methodology. With reference to Brulle and Repp (1984), the current study aims to

ascertain the validity of MTS using different time intervals for the analysis of interactional data.

A later study of the behaviour of five young adults with cognitive disabilities by Bratt and Johnston (1988) identified difficulties discriminating between purposeful and reflexive behaviours during MTS. They stated that as MTS involved coding behaviours instantaneously at the pre-specified point, de-contextualised from the rest of the interaction, the underlying intention of a behaviour may be missed. In order to overcome this, Bratt and Johnston inserted a three second interval prior to the moment to be sampled, to enable the observer to 'tune-in' to the behaviour. By inserting this strategy, observer drift was limited, potentially increasing the accuracy of the coding. Another strategy that may be used to circumvent observer inaccuracy is the repeated viewing of the recorded data. This latter strategy was used in the current study.

Murphy and Harrop (1994) examined the accuracy of MTS in comparison to Partial Interval Recording (PIR). PIR involves the recording of behaviour during an interval as opposed to at the end of the interval, as with MTS. MTS and PIR methods were randomly allocated to six groups, each consisting of ten psychology students who had received training in both coding strategies. Participants coded two videos; a ten minute practice interaction and a ten minute experimental interaction. Coding intervals were marked by a bleep superimposed onto the video every ten seconds. Groups were asked to code one, two or three of the target behaviours – writing, reading or hand clasping. To gauge user perspective on the two methodologies, the participants also completed a questionnaire.

Overall, MTS was shown to be more accurate in coding target behaviours when compared between observers and also against a criterion occurrence record developed by the researcher. Levels of agreement with the criterion occurrence record were consistently acceptable for MTS. In contrast, only one behaviour reached an acceptable level of agreement from PIR. Inter-observer agreement was also consistently high for the MTS methodology with 96.67% of 'scores' being over 0.6 on a Kappa calculation in comparison to only 56.67% of PIR 'scores'. Questionnaire findings further supported the use of MTS. Over four times more participants stated they would be able to sustain the use of MTS for

up to 30 minutes than those from the PIR methodology groups. This study therefore demonstrates MTS to be an accurate and user friendly methodology in the coding of behaviour.

MTS has been shown as an efficient coding methodology for a variety of physical behaviours, however it is yet to be proven in the coding of communicative interaction. Communication is a complex process involving a large number of behaviours. Therefore, the intricacies of these communicative behaviours and resulting considerations for the employment of MTS are discussed in the following section.

#### **4.2.2 Interaction and communication behaviours**

Communication incorporates a wide range of modalities including speech, which is the most commonly expected. Preceding the development of speech, a child uses a large number of modalities for the purpose of communication. These behaviours enable the emergence of language. They most commonly include eye contact, vocalisation, environmental reference and gesture in order to communicate desires, explore objects and interact with others (Bruner, 1975). The use of gesture and other pre-verbal communication has also been linked to cognitive development. In a study of four French children, Blake and Dolgoy (1993) examined the development of gesture in association with the development of specific cognitive abilities as children matured from nine to fourteen months old. The study found that the use of gesture, such as pointing during sharing of a book or showing an object to someone by holding it up, was dependent on the cognitive ability to complete means-ends tasks (Blake and Dolgoy, 1993). Other links between the development of specific gestures and cognitive ability such as object permanence were also shown. These findings demonstrate the link between cognitive development preceding the emergence of some communicative gestures that later lead to verbal communication (Blake and Dolgoy, 1993).

The above study supports the earlier research by Blake et al. (1992), who identified that the pre-verbal communicative modalities of ten English-Canadian children increased the informative function during the development of speech. This research was designed as a longitudinal observational study examining the participants between the ages of nine to twenty-two months. The findings showed

the use of vocalisation alongside gesture increased with age and developing language. Eye contact was also shown to increase during the second year; specifically in relation to gestures of emotion, requesting and comments (Blake et al., 1992). The importance of emergent communication behaviours for future language development is well demonstrated by these early studies. However, for individuals with SEND, the development of emergent communication behaviours may be affected.

In a study investigating the development of emergent communication in children with Autistic Spectrum Conditions (ASC), Mitchell et al. (2006) identified that children who were later diagnosed with ASC showed fewer gestures at twelve months than their peers. This may link to the fact that early gesture can demonstrate communicative intention and social interest; a known difficulty for people with ASC (Mitchell et al., 2006). The data collected during this study was backed up by retrospective reporting and viewing of home videos by parents. This also identified the reduced use of gesture by the child with ASC in comparison to a typically developing sibling. At 18 months the children with ASC understood and produced fewer words than their siblings and the control group (Mitchell et al., 2006). This demonstrates the importance of gesture as a “bridge towards later word production” for all children not just those following the normal developmental pattern (Mitchell et al., 2006: 77).

Physical disability may also affect early communication behaviours in children who have conditions such as cerebral palsy. Due to the physical limitations of this condition, non-verbal communicative modalities such as gesture may be restricted. Early non-verbal communication attempts such as grabbing for a desired object may be unclear (Pennington, 2008). In these circumstances, other emergent communication behaviours such as vocalisation and eye-gaze become more important in the development of communication for such individuals. In a review of the literature, Bedrosian (1997) discussed how emergent communication behaviours become a part of on-going communication for individuals with complex communication needs and those using alternative communication. As a result, the employment of considerable non-verbal communication alongside verbal communication is often a characteristic of interaction between aided speakers (AS) and natural speakers (NS) (Bedrosian, 1997).

For a child with limited speech, non-verbal communication behaviours can be employed to attract attention, indicate desires, agreement and disagreement. The use of gesture, vocalisation and eye contact may also demonstrate the communicative desire of a child restricted by a disability. In support of the review by Bedrosian (1997), Schlosser (2003) acknowledged that children who use AAC utilise a number of different communicative modalities alongside their AAC device. For a child who relies on alternatives to speech, recognition of all communicative modalities is important. A total of eleven communicative modalities were identified for coding the data of the current study. These modalities were identified during the pilot study described in the previous chapter. All modalities considered to be emergent behaviours are included (see Chapter Three p.63).

### **4.2.3 Study Aims**

MTS has been identified as an effective observation tool in behavioural research, but is not widely used in the field of speech and language therapy or interaction research. Despite evidence supporting the reliability of MTS, further study to expand the evidence of the methodology's wider use is still required. The study of MTS reliability also lacks recent investigation with most researchers still relying on the evidence provided by Brulle and Repp (1984). If shown to be reliable, this methodology may provide an accurate method of coding language interaction in a more efficient way than real-time coding.

The importance of communicative modality and wide range of use across partners in AS and NS interaction highlighted this dependent variable as a suitable focus for the study. This measure would also test the reliability of the MTS methodology in picking up the lower frequency modalities. This is important to ensure a realistic overview of communicative behaviour can be gathered despite only coding data at intervals. The current study aimed to explore the reliability and validity of different MTS time intervals in the coding of speech and language behaviour, i.e. communicative modality.

## **4.3 Methodology**

### **4.3.1 Procedure**

The methodology of the Brulle and Repp (1984) study was used as a model to test the reliability of various MTS time intervals. This reliability study sampled one, thirty minute interaction collected during data collection for the main study. This replicated and simplified the five, thirty minute pieces of data used in the original research. Only one, thirty-minute sample was selected due to the exploratory and subsidiary nature of this investigation. As noted by Brulle and Repp (1984) the interactional data that is used is unimportant as the focus of the research is to identify the accuracy of the time intervals, not of the coding structure or the researcher collecting data (Brulle and Repp, 1984). The half hour sample showed an interaction between a child who uses AAC and a familiar teaching assistant during the construction of a fictional narrative. The fictional narrative in use was *The Squirrel Story* (Carey et al., 2006). This interaction was selected as it was the longest of those captured during the main study, enabling MTS coding to be completed during one continuous interaction, as opposed to a number of shorter pieces of data edited to form a 30 minute clip.

As the interaction was taken from the main study, full detail of the data collection procedure was provided in Chapter Three (p.63). Coding was completed for only the NS teaching assistant due to the time constraints of this small scale study. The NS was selected as they were seen to be the more active and dynamic communicator throughout the interaction, despite the fact the story was being elicited from the AS. It was felt that the NS would produce a wider range of communicative modalities, and change modality on more occasions, enabling the coding structure and MTS methodology to be better tested.

The NS in the interaction was a communication specialist teaching assistant who had worked with children with SEND for nine years. She had worked with the AS interlocutor for a total of three years. The coded sample began at the point the AS was asked to re-tell the story and was stopped once it had been confirmed the AS had completed their narrative and praise had been given. During the interaction the NS was instructed to support the AS as per usual to enable them to tell the story.

Once the interaction had been sampled, a bleep track was created in Adobe Audition and superimposed onto the video data for each time interval using Adobe Premiere Elements 4.0. The time intervals used for sampling were 10, 20, 30, 60 and 120 seconds. These intervals were selected in order to replicate those used by Brulle and Repp (1984). However, the 240 second interval was discounted, as the 240 second interval was shown to be highly inaccurate in their study. The dynamic, multi-modal nature of NS and AS interaction was also a factor in this decision. It was likely that modalities would change rapidly during the interaction, making it difficult for the larger intervals to accurately capture communicative modality use.

All data were then transformed into an .avi encoded video file to be played on a laptop during coding. Two coding sessions were held in which both the researcher and a second coder coded the data simultaneously. As both coders had previously used the coding structure and MTS methodology during the main study, it was felt that no extra training was required. A summary sheet of the code abbreviations, the full definitions and rules of the coding structure were available at all times during the coding (appendices B12 and B16). Data were coded for eleven different communicative modalities: 'speech', 'vocal gesture', 'co-action', 'AAC-encoding', 'AAC-output', 'eye gaze-person', 'eye gaze-device', 'eye gaze-object', 'facial and body gesture', 'sign' and 'environmental reference'. These categories were devised through a pilot study to ensure all aspects of communication were captured during the interaction. Full detail of the development of this coding structure is provided in the methodology chapter (p.63).

The researchers coded the communicative modalities in use at each bleep by placing a mark on a paper check sheet; on which each category was represented in a column and rows represented each moment sampled. This process was repeated five times, once for each time interval. Once all coding was completed, the data on the check-sheets were entered onto a computerised spreadsheet for ease of analysis.

### **4.3.2 Data Analysis**

The check sheets of coded data were used to calculate the frequency of each communicative modality at each time interval. However, as the MTS time intervals increased, less coding instances were completed and therefore frequencies did not accurately represent the differences in coding across time intervals. For this reason, frequencies were transformed into a percentage of the total communicative acts. This enabled any change in the findings across time intervals to be identified. The mean frequency between coders and resulting percentage was then calculated for each of the communicative modalities. By using the mean score, a comparison could be made across time intervals. The modalities were then placed in rank order to highlight any difference in the hierarchy of modalities in use across the different time intervals.

In order to test the reliability of the coding framework with MTS sampling, a Cohen's Kappa Coefficient was calculated for each time interval. This also ensured the use of the mean frequency of communicative moves across coders was credible. Summary tables were used to check that no individual communicative modality produced a notable number of disagreements between coders. As only one interaction was coded during this study, not enough data was created to complete any inferential statistics on the findings. Therefore, descriptive statistics and rank ordering was used to produce tables and figures that best illustrate the findings.

### **4.4 Findings**

The frequencies and resulting percentages calculated show some differences between time intervals (Table 4.4a). Once rank ordered, slight variation was found in the hierarchy of communicative modalities across intervals. Some communicative modalities were completely lost from coding at intervals over 30 seconds (e.g. 'neutral' (N); 'eye gaze-object' (EO); 'vocalisation' (V)).



Modality	Interval (seconds)					Colour	Rank
	10	20	30	60	120		
Sp	19.42	17.97	23.09	25.25	22.65		1
V	0.33	0.34	0	0	0		2
Co-A	8.64	11.53	9.12	4.04	7.55		3
AAC-E	0	0	0	0	0		4
AAC-O	0	0	0	0	0		5
EP	29.36	27.45	28.36	31.37	30.20		6
ED	28.87	30.17	28.37	28.25	28.28		7
EO	2.62	3.73	1.92	3.00	0		8
G	1.96	2.71	1.92	4.04	3.77		9
S	0	0	0	0	0		
Env	7.18	5.42	6.25	4.04	7.55		
N	1.63	0.68	0.96	0	0		
NPC	0	0	0	0	0		

Table 4.4a: Mean distribution of Coded Communicative instances (%) according to communicative modality, rank ordered by colour

The use of rank order highlighted differences between time intervals. The communicative modalities ranked one to four showed a reasonable level of consistency, with rank one and two encompassing eye-gaze either towards a person or device. Speech was ranked third across all time intervals and co-action was consistently ranked fourth. For the modalities in the lower ranks, however, variation was noted. For example, ‘neutral’ (N-rank eight) was only coded during the use of the time intervals at 10, 20 and 30 seconds and ‘vocalisation’ (V-rank nine) was only identified in the data coded at ten and twenty second intervals.

Figure 4.4a shows the reduction in coding of some modalities as MTS time intervals were increased. This line graph demonstrates the large variation that occurred across time interval within some modalities: ‘speech’: range=7.28%; ‘co-action’: range=7.49%. This variation increased as intervals became larger. Other modalities demonstrate good consistency across time intervals. For example ‘eye gaze device’: range=1.92%; ‘gesture’: range=2.12%.

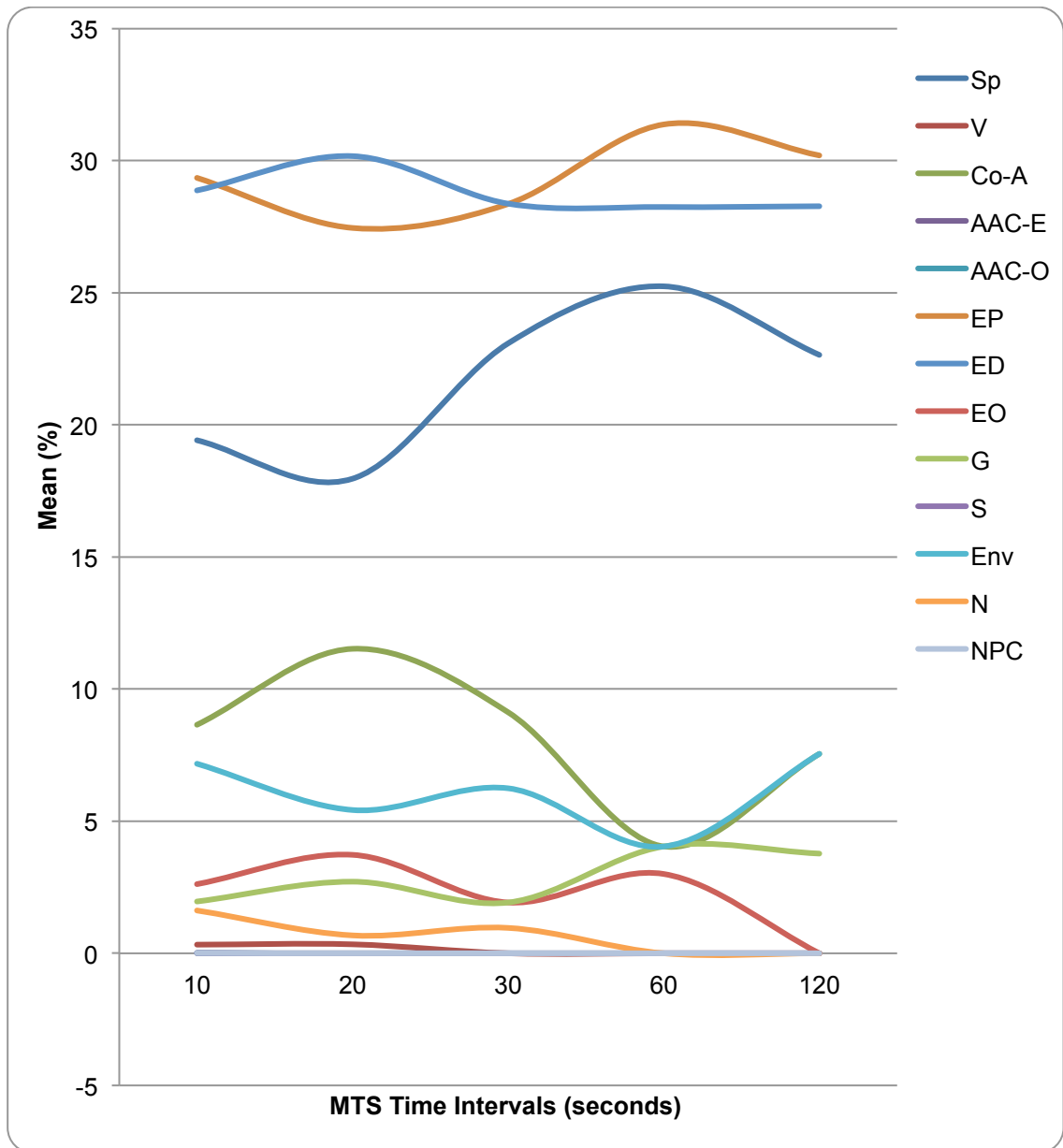


Figure 4.4a: Line graph depicting spread of communicative modality use (%) across time intervals (seconds)

In order to establish the reliability of the MTS methodology a Cohen's Kappa coefficient was calculated for each of the time intervals (Table 4.4b). The scores demonstrated reliability at an 'excellent' level for all time intervals apart from 30 seconds which was rated as 'good' according to Fleiss's (1981) interpretation. The highest reliability was shown at 60 and 120 second intervals. However, over the thirty minute data sample only 15 points were coded at the 120 second interval in comparison to 180 points coded using the ten second interval. This produced greater potential for inter-rater disagreement at the lower time intervals.

Interval (secs)	K=
10	0.75
20	0.78
30	0.72
60	0.83
120	0.95

Table 4.4b: Cohen's Kappa co-efficient scores for inter-rater reliability across MTS intervals

## 4.5 Discussion

The findings of this study serve to demonstrate the reliability of the MTS methodology in the coding of interactional data. All time intervals produced *K* scores of mainly 'excellent' and one 'good' according to Fleiss's (1981) interpretation. This demonstrates the communicative modality coding framework when used with the MTS methodology was reliable across coders. Both coders who took part in this study were familiar with the data and experienced in the use of the MTS methodology. This is likely to have had a positive effect on the coding. For this reason, it is suggested that coders using the MTS methodology use practice sessions or pilots to become familiar with the process prior to completing real data analysis.

Brulle and Repp (1984) considered intervals under 60 seconds as accurate and ten and twenty second intervals as optimum for coding behavioural data. The findings from the current study support this, identifying ten and twenty second intervals as the most accurate in capturing the communicative modalities employed in narrative interaction. In contrast to Brulle and Repp (1984), intervals above twenty seconds began to show some inaccuracies. Some communicative modalities were missed from coding when using an interval of thirty seconds or higher. Therefore, the coding did not maintain the integrity of the interaction pattern when using a time sampling interval of more than twenty seconds.

The discovery of differences in the representational levels of the communicative modalities at the thirty second interval is lower than the sixty second accuracy level suggested by Brulle and Repp (1984). One reason for this may be the larger number of codes used (eleven) in contrast to the five

behaviours in the original study. This increased number of codes led to a more specific level of investigation, with each code covering a single modality of communication, as opposed to a complete behaviour. This specificity enables a greater depth of exploration within an interaction.

The highly dynamic nature of AS:NS interaction must also be taken into account when considering the suitability of the time intervals in use. Interaction between NS and AS has previously been shown to incorporate a larger number of different modalities (Light et al., 1985b) as well as numerous communicative moves by both interlocutors, but in particular the NS (Light et al., 1985a).

The findings show that the higher the frequency of a communicative modality the more reliable the time intervals appeared to be in capturing its use. Therefore, the modalities missed by the MTS at the longer time intervals were those of a lower frequency: 'vocalisation', 'eye gaze-object' and 'neutral'. Only the NS half of the interaction was coded during this pilot. However, the findings suggest that low frequency communicative modalities would also be missed from the AS data by MTS time intervals greater than 30 seconds. This would have a significant impact on the interpretation of an individual's communication as detailed below.

Both vocalisation and eye-gaze towards an object are known to be emergent communication behaviours that precede language use (Bruner, 1975). Emergent communication behaviours are linked to language development, with increased use being noted as children move towards verbal communication (Blake et al., 1992, Blake and Dolgoy, 1993). The role of non-verbal communication is also of great importance during adult interaction (Cheepen, 1988). Active listening, turn-taking cues and the pragmatics of language can all be demonstrated through the use of vocalisation and other non-verbal modalities (Cheepen, 1988). For this reason, if these behaviours were not recorded by the MTS methodology, the findings gathered would provide an inaccurate portrayal of the interaction. The loss of the code 'neutral' may lead to inaccuracies in the understanding of how turns occurred within the interaction. Neutral behaviour opens the communicative floor to the conversation partner and may therefore play a role in turn-taking during the interaction. The observation methodology must

therefore be accurate enough to enable coding of all behaviours that occur, however infrequently.

The importance of the communicative modalities lost at larger time intervals is not isolated to typically developing or mature communication. These behaviours were noted by Bedrosian (1997) as playing a consistent role in the interactions of children who use alternative communication. AS interaction is multimodal and therefore recognition must be made of all modalities in use (Light et al., 1985c). These non-verbal communicative modalities enable a precise portrayal of an individual's communicative abilities.

Due to their role as emergent behaviours and within interaction, vocalisation and eye-gaze towards an object may also play an important part in gauging a child's level of communicative intent. Therefore, for MTS to be of use in interaction research, the reliability and accuracy of the time interval employed must ensure no communicative behaviours are missed. It is therefore suggested that only intervals of 20 seconds or less are used in the coding of interactions for communicative behaviours.

#### **4.6 Limitations and Conclusions**

The findings discussed above must be accepted with some caution due to the small scale nature of this reliability study. Due to the time constraints of this as a subsidiary to the main PhD project, only data from the NS participant were coded and analysed. This provided valuable information regarding the MTS methodology. However, calculating the reliability of this methodology for interactive data should ideally examine dialogic contributions from both interlocutors.

A larger sample of data would also improve the credibility of the findings. Only one, thirty minute sample was used in this study in comparison to the five, thirty minute samples used in the original study by Brulle and Repp (1984). A larger data set would enable further in-depth examination of the reliability of each time interval and the application of inferential statistics to investigate differences between the data coded at the different time intervals.

In conclusion, MTS provides an efficient and reliable methodology in order to sample and code interaction. From these findings, in support of Brulle and Repp (1984), it is recommended that coding utilises a time interval no greater than twenty seconds. The use of a ten or twenty second time interval should also limit the loss of low frequency behaviours from coding. The findings reported support the use of MTS as an effective observation methodology within speech and language therapy research. However, further research is needed to provide more substantial evidence across a wider range of individuals and communicative behaviours.

# Chapter Five

## Findings

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### 5.1 Introduction

This chapter presents the findings for each single case according to the outcome measures. The order of presentation is informed by primary diagnosis, such that participants B and S (cerebral palsy) are addressed initially, and then participants J and O (ASC presentation). A summary of participant demographics is provided at the start of each single case section. The results comprise a series of summary tables and descriptive analyses. All tables and figures display the means unless otherwise stated and full tables of results are available in the appendices (appendix section C). Percentages of the total communicative acts are provided alongside mean and range for communicative modality. Excerpts from the transcribed narratives are provided to illustrate particular phenomena or features of the data. Full Transcripts of all narrative interactions are available in the appendices (section C).

### 5.2 Construction of Narrative

There was one overarching research question: How is narrative constructed within a teacher (natural speaker) - pupil (aided speaker) dyad under the conditions of: a) personal narrative and b) fictional narrative? This was investigated through specific address of three research questions:

RQ 1. What characterises the communicative roles occupied by teacher (natural speaker) and student (aided speaker) in the construction of narrative?

RQ 2. How does narrative condition affect the contributions of teacher (natural speaker) and student (aided speaker)?

RQ 3. How do communicative modality and linguistic move-type correspond in the narrative interaction?

RQ1 was addressed using the combined data for each participant or interlocutor from the two narrative conditions. There were two outcome measures: coding of communicative modality and linguistic move-types. Communicative modality was coded using the MTS methodology (see Chapter Four; p.108). Linguistic move-types were coded using the full transcripts of the narrative interactions (see coding framework; p.86)

RQ2 was addressed using the separate data from the two narrative conditions, examining the effect of narrative context on narrative construction. Three outcome measures were examined: communicative modality, linguistic move-type (as above) and measures of linguistic complexity (TTR, total content words and total function words). Therefore, the mean is derived from the data for each condition across four sessions.

RQ3 was addressed through the review of all coded transcripts, identifying any patterns demonstrating correspondence between communicative modality and linguistic-move type. Excerpts from the transcripts are presented to illustrate the phenomena identified. Factors of influence are considered and possible explanations are suggested. These will be explored further in Chapter Six (Discussion).

### **5.2.1 Participant 'B'**

Participant B was a 10;11 year old boy with a diagnosis of athetoid-type cerebral palsy. He experienced a high number of involuntary gross motor movements as a result of his cerebral palsy and was also an electric wheelchair user. Participant B had corrected vision with glasses. He showed consistent understanding at the two to three word level, although this could be higher when in context. Verbally, he was able to construct simple five to six word phrases, which were generally grammatically correct, but would tend to produce single or two word contributions on his AAC device. He had severely dysarthric speech, which made the majority of his verbal communication unintelligible. To support his communication he used a Dynavox MT4 with a key-guard, which he accessed directly (see appendix B8). At the time of data collection he had been using this AAC device for three years. He also used gesture, facial expression and some Makaton signing as methods of communication.



The NS was a female class teacher who had been working with Participant B for approximately six months (two terms). She had 17 years' experience working with individuals with SEND. She had no prior experience of high-tech AAC before working with Participant B.

It was not possible to analyse any aspects of linguistic complexity for Participant B due to the large amount of unintelligible speech produced. Although some words and phrases were transcribed, using only these to calculate the TTR, number of content or function words would have produced a value that was not representative of the participant's linguistic complexity. This was therefore deemed inappropriate.

#### *RQ1 Communicative Roles - Linguistic Move-Type*

The first set of results presented is for the measure of linguistic move-type as shown in table 5.2.1a on the following page.

<b>Linguistic Move-type</b>		<b>AS</b>		<b>NS</b>	
<b>Prep</b>	Ready	-	-	3.00	(0-3)
<b>Initiation</b>	Instruct	0.25	(0-1)	17.50	(0-18)
	Explain	0.25	(0-1)	9.25	(0-11)
	Inform	54.75	(7-57)	2.00	(0-3)
	Check	0.25	(0-1)	25.25	(5-33)
	Align	-	-	0.50	(0-2)
	Query-YN	0.25	(0-1)	25.50	(1-30)
	Query-W	1.00	(0-3)	60.50	(6-63)
	Query-Choice	-	-	0.75	(0-2)
	Query-Completion	-	-	8.25	(0-9)
	Request help	-	-	-	-
<b>Response</b>	Acknowledge	0.75	(0-1)	64.00	(22-49)
	Object	-	-	3.00	(0-4)
	Reply-Y	26.50	(4-26)	0.25	(0-1)
	Reply-N	4.50	(0-7)	-	-
	Reply-W	41.00	(7-37)	0.75	(0-3)
	Response to instruction	10.00	(0-10)	0.25	(0-1)
	Reply-Choice	0.50	(0-1)	-	-
	Reply-Completion	6.75	(0-9)	-	-
	Clarify	-	-	-	-
	Praise	-	-	6.25	(1-6)
	Comment	1.00	(0-2)	14.50	(2-13)
	Summarise	-	-	2.50	(0-3)
<b>Other</b>	Repetition	0.50	(0-1)	-	-
	Operation of device-Other	-	-	-	-
	NPC	6.50	(0-13)	-	-
<b>Summary</b>	Mean Preparation Moves	-	-	3.00	-
	Mean Initiation Moves	56.75	-	149.50	-
	Mean Response Moves	91.00	-	91.50	-

Table 5.2.1a Summary of mean (range) coded instances of linguistic move-types and other coded categories

There was a mean of 398.75 coded instances (all moves made including non-communicative moves categorised as 'other') for the four data collection sessions (AS<NS = 154.75<244.00) showing a difference of 89.25 between the interlocutors. There was a mean of 391.75 coded linguistic moves (AS<NS = 147.75<244.00) showing a difference of 96.25 between the interlocutors. Mean initiation moves showed the greatest difference between interlocutors in terms of move type (AS<NS = 56.75<149.50). Both interlocutors produced similar mean response moves across the four sessions (AS<NS = 91.00<91.50).

Excerpt 5.2.1a (FN; Session 1; 'The Squirrel Story') illustrates the large number of NS initiations followed by AS response moves employed in order to construct the narrative. During the excerpt the NS made a total of six initiation-type moves and two response moves and the AS used only four moves, which were all responses. The NS therefore takes twice the number of moves made by the AS and all initiations, controlling the pattern of narrative discourse. Initiation-type moves are coded in green and response moves are coded in red.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
90	NS	who came along?		QW
91	AS	(*unintelligible speech)		RW
92	NS	who came to help?		QW
93	AS	(point) mister (*unintelligible speech)	points to page	RW
94	NS	mister		QC
95	AS	worm (point)	points to page	RC
96	NS	Mr Badger (..) can you find him (.) is he there? (..) no (.) no he's not there is he		O QYN Co
97	NS	what did Mr Badger do? (point)	points to page	QW
98	AS		looks and gestures towards device	
99	NS	do you want to have a look on the other page and see if you can see him? (point)	points to device screen	QYN
100	AS	ok	accesses device	RY

Excerpt 5.2.1a Transcription example showing NS' predominant use of initiation moves

The most frequently occurring linguistic move-types employed by the interlocutors (from highest to lowest) were as follows: AS: 'inform'=54.75 (37.06%); 'reply-W'=41.00 (27.75%); 'reply-Y'=26.50 (17.94%); 'response to instruction'=10.00 (6.77%); NS: 'acknowledge'=64.00 (26.23%); 'query-W'=60.50 (24.80%); 'query-Y/N'=25.50 (10.45%); 'instruct'=17.50 (7.17%). The most frequently employed moves show links between NS initiation and AS response moves, which will be discussed further in Chapter Six (Discussion).

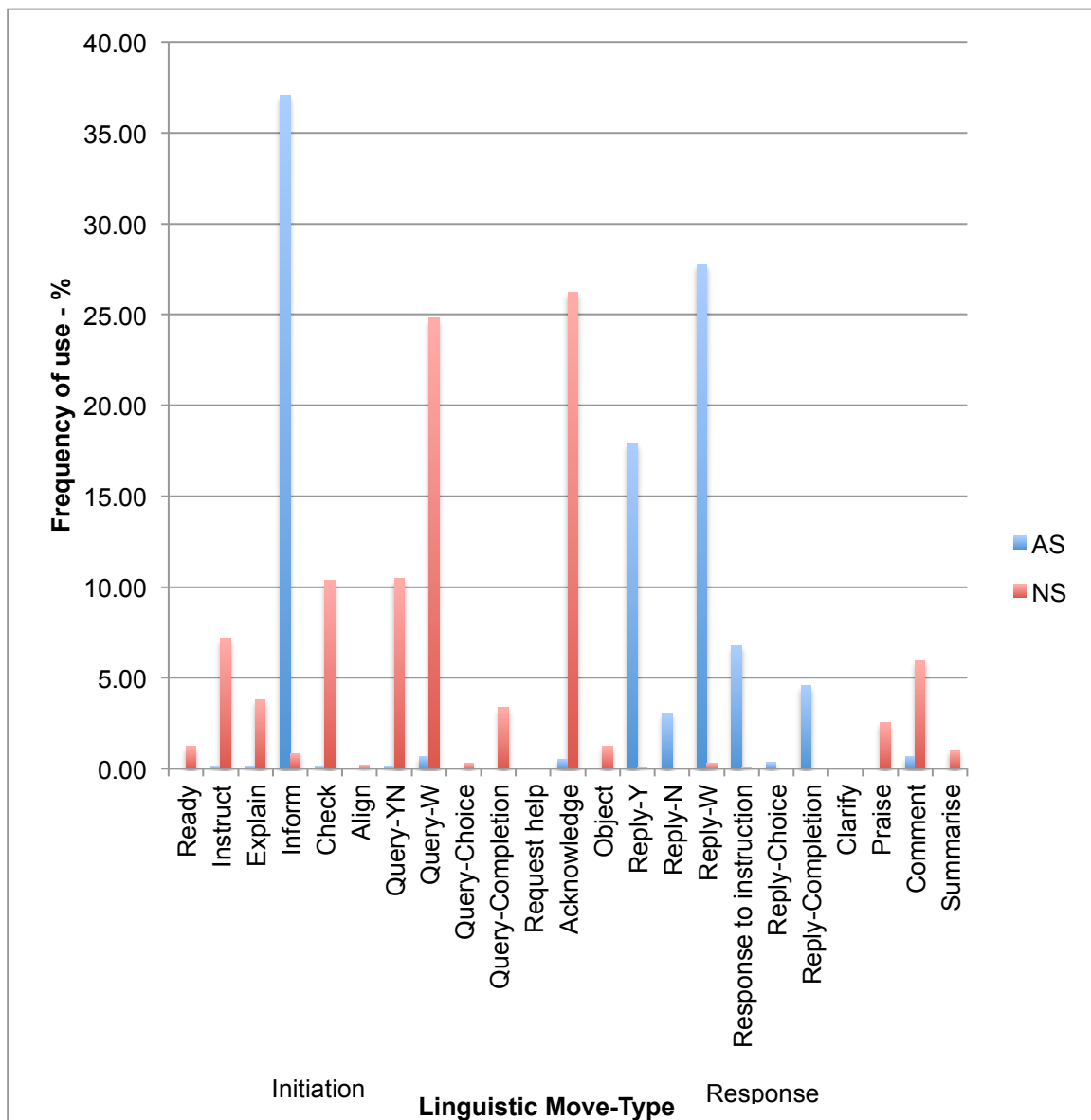


Figure 5.2.1a Distribution of Linguistic Move-types (%) across four data collection sessions

As shown in figure 5.2.1a, the NS made approximately three times more initiation move-types than the AS. Expected initiation-response pairs were observed within the highest occurring move-types. For example AS ‘inform’ – NS ‘acknowledge’; NS ‘query-W’ – AS ‘reply-W’. The NS asked more questions than the AS, shown by the prefix ‘query’ (AS<NS = 1.00<36.50). The most frequently occurring type was ‘query-W’. There was considerable variation in the occurrence of linguistic move-types across the four data collection sessions, as indicated by the difference between minimum and maximum scores (range): AS: ‘inform’=50; ‘reply-W’=30; ‘reply-Y’=22; NS: ‘query-W’=57; query-Y/N’=29; ‘check’=28; ‘acknowledge’=27.

## RQ2 Narrative Condition – Linguistic Move-Type

The second set of results is for the measure of linguistic moves across the personal and fictional narrative conditions, as shown in table 5.2.1b.

Linguistic Move		Personal (PN)				Fictional (FN)			
		AS		NS		AS		NS	
Prep	Ready	-	-	1.75	(0-3)	-	-	1.25	(1-2)
	Instruct	-	-	12.75	(4-18)	0.25	(0-1)	4.75	(0-14)
	Explain	0.25	(0-1)	7.25	(3-11)	-	-	2.00	(1-4)
	Inform	29.00	(7-57)	1.50	(0-3)	25.75	(16-39)	0.50	(0-2)
	Check	0.25	(0-1)	18.25	(11-34)	-	-	7.00	(5-12)
	Align	-	-	-	-	-	-	0.50	(0-2)
	Query-YN	0.25	(0-1)	17.00	(8-30)	-	-	8.50	(1-16)
	Query-W	0.75	(0-3)	38.50	(16-62)	0.25	(0-1)	22.00	(6-36)
	Query-Choice	-	-	0.75	(0-2)	-	-	-	-
	Query-Completion	-	-	4.50	(2-9)	-	-	3.75	(1-11)
	Request help	-	-	-	-	-	-	-	-
	Initiation	Acknowledge	0.50	(0-1)	30.50	(23-45)	0.25	(0-1)	33.50
Object		-	-	1.25	(0-3)	-	-	1.75	(0-3)
Reply-Y		19.25	(14-26)	0.25	(0-1)	7.25	(4-10)	-	-
Reply-N		3.00	(0-7)	-	-	1.50	(0-4)	-	-
Reply-W		24.00	(11-37)	0.75	(0-3)	17.00	(7-25)	-	-
Response to instruction		7.50	(4-10)	-	-	2.50	(0-7)	0.25	(0-1)
Reply-Choice		0.50	(0-1)	-	-	-	-	-	-
Reply-Completion		4.25	(2-8)	-	-	2.50	(0-9)	-	-
Clarify		-	-	-	-	-	-	-	-
Praise		-	-	3.25	(1-6)	-	-	3.00	(2-4)
Comment		0.50	(0-1)	8.00	(3-16)	0.50	(0-2)	6.50	(1-13)
Summarise		-	-	1.50	(0-3)	-	-	1.00	(1-1)
Response	Repetition	0.25	(0-1)	-	-	0.25	(0-1)	-	-
	NPC	-	-	-	-	-	-	-	-
	Operation of device-Other	4.00	(0-13)	-	-	2.50	(0-7)	-	-
Other	Mean Preparation Moves	-	-	1.75	-	-	-	1.25	-
	Mean Initiation Moves	30.50	-	100.50	-	26.25	-	49.00	-
	Mean Response Moves	59.50	-	45.50	-	31.50	-	46.00	-
	Summary								

Table 5.2.1b Summary of mean (range) linguistic move-types and other coded categories according to narrative condition

The mean of coded instances for the two narrative conditions was 398.75 (PN>FN = 242.00>156.75) showing a difference of 85.25 between the conditions. There was a mean of 391.75 linguistic moves coded (PN>FN = 237.75>154.00) showing a difference of 83.75 between the conditions. Mean initiation moves

showed the greatest difference across the two conditions, (PN>FN = 131.00>75.25).

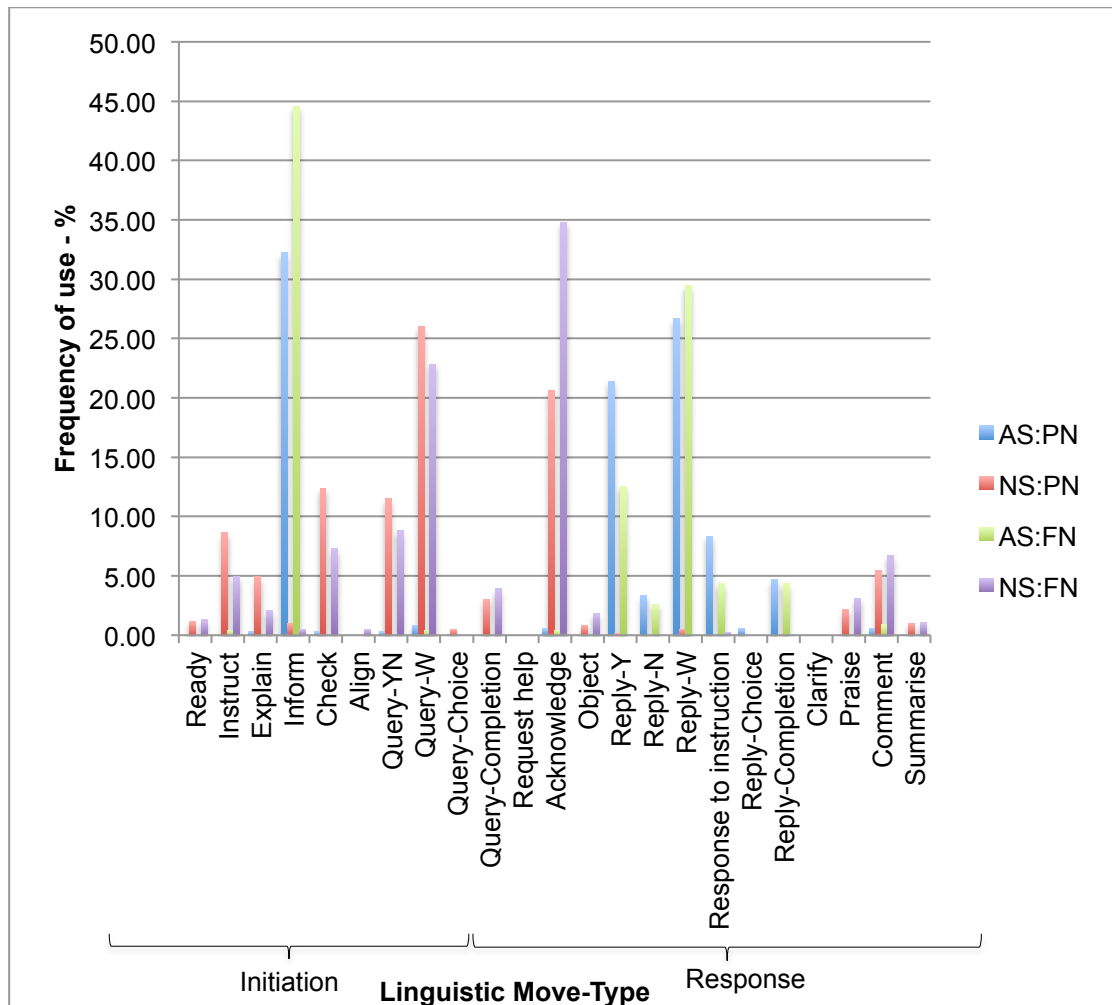


Figure 5.2.1b Distribution of Linguistic Move-types between narrative conditions for both interlocutors

The largest differences between the interlocutors by condition were for PN: 'query-W': AS<NS = 0.75 (0.83%)<38.50 (26.06%); 'acknowledge': AS<NS = 0.50 (0.56%) <30.50 (20.64%); 'inform': AS>NS = 29.00 (32.22%)>1.50 (1.02%); 'reply-W': AS>NS = 24.00 (26.67%)>0.75 (0.51%). For FN condition it was: 'acknowledge': AS<NS = 0.25 (0.43%)<33.50 (34.81%); 'inform': AS>NS = 25.75 (44.59%)>0.50 (0.52%); 'query-W': AS<NS = 0.25 (0.43%)<22.00 (22.86%); 'reply-W': AS>NS = 17.00 (29.44%)>0.

When the data are separated by narrative condition, there is variation in the use of linguistic move-types by each interlocutor across the two conditions. This is

shown both between interlocutors by condition and in mean linguistic move-types, as shown in figure 5.2.1b.

Codings of linguistic move-types varied according to condition. Total moves coded for AS: PN>FN = 90.00>57.75 showed a difference of 32.25 between conditions; NS: PN>FN = 147.75>96.25 showed a difference of 51.50 between conditions. The biggest differences between the conditions by interlocutors were for AS: 'reply-Y': PN>FN = 19.25 (21.39%)>7.25 (12.55%); 'reply-W': PN>FN = 24.00 (26.67%)>17.00 (29.44%); for NS: 'query-W': PN>FN = 38.50 (26.06%)>22.00 (22.86%); 'check': PN>FN = 18.25 (12.35%)>7.00 (7.27%); 'query-Y/N': PN>FN = 17.00 (11.51%)>8.50 (8.83%).

Excerpt 5.2.1b (PN; Session 2; 'a Christmas') illustrates the large number of NS yes/no questions (QYN = 10.65%) and check questions (C = 10.35%) employed following AS narrative information. These questions were employed in order to confirm and expand B's narrative contributions. The large number of 'QYN' and 'C' questions were linked to the increased use of yes responses (RY) by Participant B during personal narrative, shown below. The increased number of NS questions used to confirm information provided by the AS could be explained by the lack of NS prior plot knowledge during personal narrative construction. The NS is observed trying to expand the dialogue through questioning (line 102) which may be in response to the AS gesture in line 99. This will be explored further in the discussion chapter (Chapter Six p.200).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
99	AS	B had a <u>CUSHION</u>	holds arms out wide to indicate a big cushion	In
100	NS	a cushion?		C
101	AS	yeh		RY
102	NS	oh a big cushion?		QYN
103	AS	yeh		RY
104	NS	was it (.) and was it for you?		A QYN
105	AS	yeh		RY
106	NS	oh lovely (.) and did D*name get a Christmas present?		Co QYN
107	AS	yeh		RY
108	NS	What did D*name get?		QW
109	AS	a toy (.) a toy car		RW
110	NS	a toy car (.) oh lovely		A

				Co
111	AS	and I got a toy (*unintelligible speech)		In
112	NS	and you got a toy		QC
113	AS	(*unintelligible speech)		RC
114	NS	king?		C
115	AS	yeh		RY
116	NS	really?		C
117	AS	yeh		RY
118	NS	oh right (.) and what did he do?		A

Excerpt 5.2.1b Transcription example showing NS frequent use of QYN and C query-type moves

### *Summary*

The NS took approximately three times more initiation-type moves than the AS. However, the interlocutors had a similar mean number of response moves. The NS in this partnership with 'B' was the only participant to use preparation-type moves across all interactions, employing moves coded as 'ready' to begin the interaction. The initiation-type move employed most by the AS was 'inform', indicating some independent narrative construction during the recorded interactions. A higher mean was recorded for NS use of 'acknowledge', 'praise' and 'comment' moves, indicating the provision of feedback. Some differences were observed between narrative conditions, with both interlocutors employing a higher mean total moves during personal narratives. This increase was predominantly shown in some query-type moves for the NS and the related response moves for the AS (shown in Excerpt 5.2.1b).

### *RQ1 Communicative Roles - Communicative Modality*

The following set of results is for the measure of communicative modalities across all data collection sessions, as shown in table 5.2.1c on the next page. Data shown were collected through momentary time sampling and therefore figures represent the proportion of each behaviour coded against time recorded.



	<b>Codes</b>	<b>AS</b>		<b>NS</b>		<b>%</b>	
			<b>%</b>		<b>%</b>		
Communicative Modality	Speech	44.75	(10-47)	22.18	36.50	(5-41)	15.72
	Vocal Gesture	3.25	(0-5)	1.61	1.00	(0-2)	0.43
	Co-Action	-	-	-	-	-	-
	AAC-Encoding	10.00	(1-15)	4.96	0.50	(0-1)	0.22
	AAC-Output	0.25	(0-1)	0.12	-	-	-
	Eye Gaze - Person	46.50	(5-54)	23.05	135.75	(34-159)	58.45
	Eye Gaze - Device	35.75	(2-37)	17.72	27.25	(1-31)	11.73
	Eye Gaze - Other	48.75	(0-45)	24.16	18.75	(0-21)	8.07
	Facial & BodyGesture	4.00	(0-5)	1.98	6.75	(0-9)	2.91
	Sign	0.50	(0-2)	0.25	0.25	(0-1)	0.11
	Env. Reference	8.00	(0-14)	3.97	5.50	(0-11)	2.37
Other	Neutral	25.50	(0-57)	-	-	-	-
	NPC	-	-	-	-	-	-

Table 5.2.1c Summary of mean (range) and percentage coded instances for each communicative modality and 'other' coded categories

There was an overall mean of 459.50 coded instances derived from the four data collection sessions (AS<NS = 227.25<232.25) showing a small difference of 5 between the interlocutors. There was a mean of 434 codings of communicative modalities, discounting coded instances under the category 'other' (AS<NS = 201.75<232.25) showing a difference of 30.50 between the interlocutors. Multiple communicative modalities were employed by the interlocutors: AS>NS =10>9 with a difference of only 1.

The most frequently occurring communicative modalities employed by the interlocutors (from highest to lowest) were as follows: AS: 'eye gaze-other' =48.75 (24.16%); 'eye gaze-person'=46.50 (23.05%); 'speech'=44.75 (22.18%); 'eye gaze-device'=35.75 (17.72%); NS: 'eye gaze-person'=135.75 (58.45%); 'speech'=36.50 (15.72%); 'eye gaze-device'=27.25 (11.73%); 'eye gaze-other'=18.75 (8.07%).

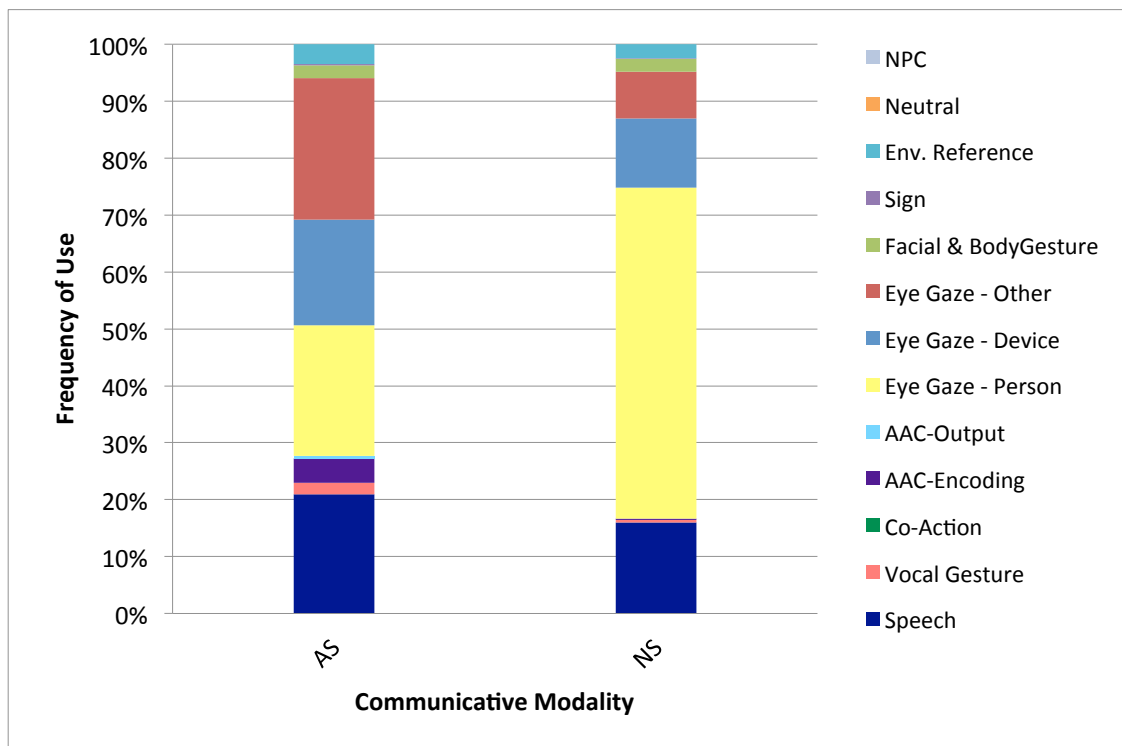


Figure 5.2.1c Distribution of communicative modalities according to interlocutor - %

Figure 5.2.1c shows the distribution of communicative modality use by interlocutor as percentages for the four sessions. Over half the coded instances of communicative modalities for the NS were 'eye gaze-person' (58.45%). In contrast, the coded instances for the AS were spread mainly over four modalities: 'eye gaze other'=24.16%; 'eye gaze person'=23.05%; 'speech'=22.18%; 'eye gaze device'=17.72%

Excerpt 5.2.1c on page 135 (FN; Session 4; 'The Squirrel Story') illustrates Participant B's frequent use of speech despite his severe dysarthria. The large quantity of unintelligible speech from Participant B led the NS to ask a number of questions in order to repair communication breakdown (lines 91-94). However, even with the consistent misunderstanding from the NS, Participant B continued to use speech to maintain the interaction. Some narrative input may have therefore been lost, as the NS was unable to understand all contributions from the AS, as shown in lines 92-95.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
85	NS	what's Mr Badger going to do?		QW
86	AS	(*unintelligible speech) (.) oh look a worm (point)	points to page	In
87	NS	'yes' (nods) there's a worm (.) and what's the worm doing?		A
88	AS	in the apple		RW
89	NS	he's in the apple yes (.) and he's watching what's going on isn't it (.) wondering what's gonna happen (..) what happens?		A Co QW
90	AS	THAT (point) (*unintelligible speech)	turns page points to page	In
91	NS	uh what happens?		QW
92	AS	(*unintelligible speech) (.)(*unintelligible speech) (.) B (*unintelligible speech)		RW
93	NS	what happens here B? (point)	points to page	QW AI
94	AS	oh no (.) (point) the baby fly in the air	points to page	RW
95	NS	he is in the air isn't he (.) he's [flying]		A Co

Excerpt 5.2.1c Transcription example of Participant B's continued use of speech during narrative construction.

The difference between minimum and maximum occurrences (range) for each communicative modality revealed considerable variation across the four data collection sessions: AS: 'eye gaze-person'=49; 'eye gaze-other'=45; 'speech'=37; 'eye gaze-device'=35; NS: 'eye gaze-person'=125; 'speech'=36; 'eye gaze-device'=30; 'eye gaze-other'=21. Some of the variation may be accounted for by the different narrative conditions. This will be addressed in the following section.

The most frequently occurring modalities were the same for both interlocutors, albeit with some difference in ranked order. These modalities also had the greatest variability across the four data collection sessions as indicated by the range. Occurrences of 'AAC-encoding' and 'AAC-output' were notably different for the AS: 'AAC-encoding'>'AAC-output' = 10.00>0.25, revealing a higher proportion of time spent on 'AAC-encoding'. The NS had some minimal input to 'AAC-encoding'=0.50. The coded instances of 'neutral' were attributed solely to the AS (mean=25.50)

## RQ2 Narrative Condition – Communicative Modality

The results for the measure of communicative modalities across personal and fictional narrative conditions are shown below in table 5.2.1d

Codes	Personal				Fictional			
	AS	%	NS	%	AS	%	NS	%
Speech	26.00 (13-47)	23.91	24.25 (17-41)	18.06	18.75 (10-32)	20.16	12.25 (5-22)	12.50
Vocal	1.75 (1-4)	1.61	-	-	1.50 (0-5)	1.61	1.00 (0-2)	1.02
Gesture	-	-	-	-	-	-	-	-
Co-Action	-	-	-	-	-	-	-	-
AAC- Encoding	8.75 (4-15)	8.05	0.50 (0-1)	0.37	1.25 (1-2)	1.34	-	-
AAC-Output	0.25 (0-1)	0.23	-	-	-	-	-	-
Eye Gaze - Person	29.50 (5-54)	27.13	83.25 (38-159)	62.01	17.00 (5-33)	18.28	52.50 (34-86)	53.57
Eye Gaze - Device	26.50 (15-37)	24.37	19.00 (11-31)	14.15	9.25 (2-17)	9.95	8.25 (1-14)	8.42
Eye Gaze - Other	13.50 (0-37)	12.41	1.50 (0-4)	1.12	35.25 (20-45)	37.90	17.25 (10-21)	17.60
Facial & BodyGesture	1.50 (1-2)	1.38	5.00 (2-9)	3.72	2.50 (0-5)	2.69	1.75 (0-5)	1.79
Sign	0.50 (0-2)	0.46	-	-	-	-	0.25 (0-1)	0.26
Env. Reference	0.50 (0-1)	0.46	0.75 (0-2)	0.56	7.50 (2-14)	8.06	4.75 (0-11)	4.85
Other								
Neutral	20.50 (0-57)	-	-	-	5.00 (0-10)	-	-	-
NPC	-	-	-	-	-	-	-	-

Table 5.2.1d Summary of mean (range) coded instances for each communicative modality and other coded categories according to narrative condition

The mean of coded instances for the two narrative conditions was 459.50 (PN>FN = 263.50>196.00) showing a difference of 67.50 between the conditions. There was a mean of 434 codings of communicative modalities (PN>FN = 243.00>191.00) showing a difference of 52 between the conditions.

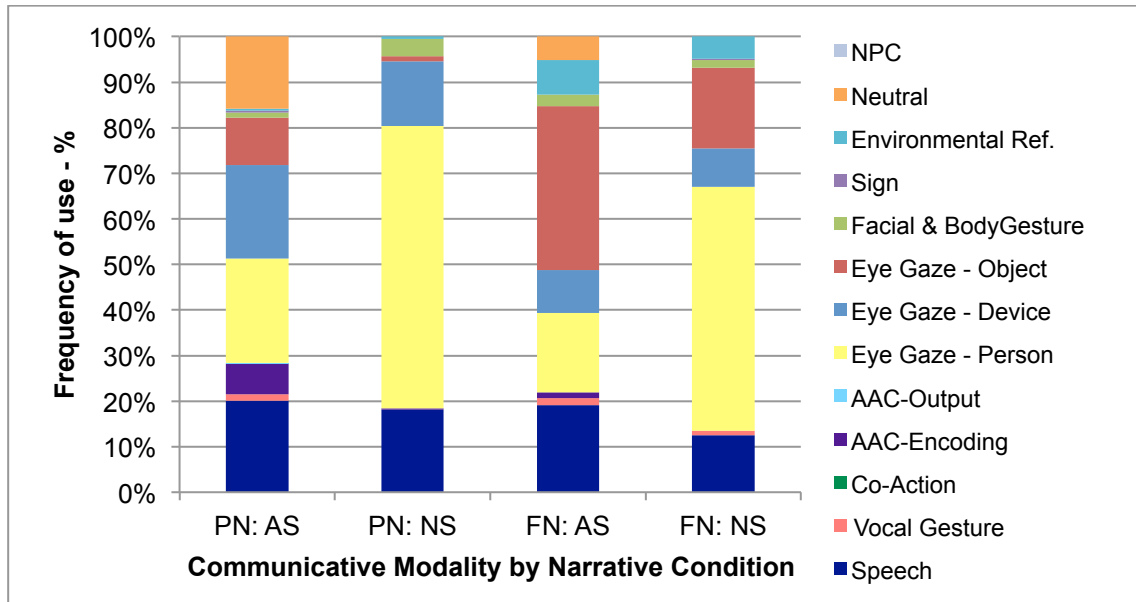


Figure 5.2.1d Distribution of communicative modalities according to interlocutor and narrative condition - %

Figure 5.2.1d shows the distribution of communicative modality use for both interlocutors between narrative conditions. The biggest differences between the interlocutors by condition were for PN: 'eye gaze-person': AS<NS = 29.50<83.25; 'eye gaze-other': AS>NS = 13.50>1.50; for the FN condition it was: 'eye gaze-person': AS<NS = 17.00<52.50.

When the data are separated by narrative condition, the majority of communicative modalities are employed with similar frequency with the notable exceptions mentioned above.

For both interlocutors, codings of communicative modalities varied according to condition, for AS: PN>FN = 108.75>93.00; NS: PN>FN = 134.25>98.00. However, longer narratives were produced during PN, which lead to the higher number of coded instances. The biggest differences between the conditions by interlocutors were for AS: 'eye gaze-device': PN>FN = 26.50 (24.37%)>9.25 (9.95%); 'eye gaze-other': PN<FN = 13.50 (12.41%)<35.25 (37.90%); for NS: 'eye gaze-person': PN>FN = 83.25 (62.01%)>52.50 (53.57%).

No considerable difference was shown in communicative modality use between interlocutors when narrative conditions were examined together. However, greater differentiation in communicative modality use was shown when

the individual communicative modalities were inspected according to narrative condition (PN or FN) and interlocutor (AS or NS). For example 'eye gaze-person': NS: PN>FN = 83.25 (62.01%)>52.50 (53.57%); AS: PN>FN = 29.50 (27.13%)>17.00 (18.28%); 'eye gaze-other': NS: PN<FN = 1.50 (1.12%)<17.25 (17.80%); AS: PN<FN = 13.50 (12.41%)<35.25 (37.90%); 'speech': NS: PN>FN = 24.25 (18.06%)>12.25 (12.50%); 'AAC-encoding': AS: PN>FN = 8.75 (8.05%)>1.25 (1.34%).

### *Summary*

A small difference was recorded between interlocutors for mean coded instances (AS<NS = 227.25<232.25). However, a larger difference was shown when comparing the mean communicative acts coded (AS<NS = 201.75<232.25). This suggests the AS was recorded completing a greater number of 'neutral' or 'not possible to code' instances. Both interlocutors employed multiple communicative modalities during both types of narrative construction. Speech and all eye gaze-type codes were the most frequently occurring for both AS and NS. Considerable variation was recorded across the data collection sessions, as shown by range.

Some small differences were identified between narrative conditions. A higher mean communicative acts was recorded under the personal narrative condition (PN>FN = 243.00>191.00), but this was due to the increased length of narratives under this condition. The majority of the communicative acts showed similar use under both conditions. Eye gaze-type moves showed greatest disparity between conditions, producing higher mean coded instances during personal narrative construction for both interlocutors.

### *RQ3 Integrated Profile of Narrative Construction*

Full transcripts coded for linguistic move-type were annotated for communicative modality in order to examine the mutual contributions of the interlocutors. This section aims to present each identified pattern of linguistic move-type and communicative modality use alongside excerpts from the transcripts. Full discussion of the suggested rationale for each communicative modality and linguistic move-type pairing will be provided in Chapter Six (Discussion).

- *Use of eye gaze*

As shown in figure 5.2.1d use of eye gaze, whether to person, device or other, was a strong characteristic of the narrative interaction. Eye gaze towards the device and ‘eye gaze-other’ occurred at the same time as a wide range of linguistic move-types. However, eye gaze towards the device and the conversation partner could be linked to the co-occurring use of hand gesture. For example, accessing the AAC device would co-occur with eye gaze towards the device and pointing or gesturing toward the fictional stimuli would co-occur with ‘eye gaze-other’.

In contrast, ‘eye gaze-person’ was linked to two different areas of discourse. For both AS and NS eye gaze-person was employed as a confirmation, co-occurring with ‘Reply-Y’ linguistic move codes. It was also employed as part of initiation moves in which information was given, e.g. ‘inform’. The NS employed ‘eye gaze-person’ in order to gain the AS’ attention and regain focus of the interaction at least once in almost all narrative constructions. Excerpt 5.2.1d (PN; Session 4; ‘First day at school’) provides an example of NS eye gaze use in conjunction with a question checking the AS’ attention and focus (C). Prior to the two moves shown below, Participant B had become distracted and was providing a narrative that was not specific to the given stimulus. Participant B returns the eye contact to the NS as a confirmation.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
262	NS	pardon? (.) don't wear yourself out because you've got another story to tell me (..) <u>ALRIGHT?</u>	looks to gain eye contact	QW Ex C
263	AS	my Daddy (.) my Daddy (..) my (.) my Daddy	gives eye contact	In

Excerpt 5.2.1d Use of ‘eye gaze-person’ by the NS and AS during personal narrative construction

- *Use of Gesture*

Hand gestures accompanied multiple linguistic move-types. Both interlocutors used hand gesture to make environmental reference, but in conjunction with different linguistic move-types. One recurring theme was NS gesture toward the AAC device in conjunction with giving instructions (‘instruct’) in order to encourage the AS to use the AAC device. This is shown in excerpt 5.2.1e on the next page

(PN: session 3; 'Pets'), which shows the NS pattern of gesture use with instruction. Four of the five NS instructions (I) were accompanied by gesture to the device, by tapping with a finger or hand. The NS may have used this gesture to augment the spoken instruction or in order to draw the AS' attention to the AAC device. This gesture could also have been produced with a dual purpose. Possible rationales for this communicative behaviour are considered in Chapter Six (Discussion). Definition of the codes shown are shown in appendix B11 (p.272).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
175	NS	can you <u>TELL ME ON HERE</u> ?	taps device with finger	I
176	AS	'C'	accesses device	RI
177	NS	<u>RIGHT</u> (nods) (.) and what about C?		A QW
178	AS	(*unintelligible speech) (.) [( <i>*unintelligible speech</i> )]		RW
179	NS	[can you <u>TELL ME ON HERE</u> ] (.) <u>TELL ME ON HERE</u>	taps device with hand nods head towards device	I I
180	AS	how (..) how ( <i>*unintelligible speech</i> ) (..) 'G'	accesses device	In RI
181	NS	what did you want to ask about [G?]		QW
182	AS	home (..) want to go [home]		RW
183	NS	[can you] <u>PUT IT ON HERE</u> please (..) 'yes' (nods) <u>ON HERE</u>	taps device with hand  taps device with hand	I  I

Excerpt 5.2.1e NS use of gesture in conjunction with 'instruct' (I) move-types

During fictional narrative construction, the presence of the storybook appeared to prompt the use of gesture by both interlocutors. Three different linguistic move-types were associated with the act of 'environmental reference' by the AS. These were recorded when relaying the story ('inform' moves, lines 67 and 69) or replying to NS questions ('reply-Y', lines 57 and 59; and 'reply-W', lines 61, 63 and 65). It is suggested the AS employed environmental reference to provide context for these linguistic move-types, as he had some self-awareness of his poor speech intelligibility. The NS used the same type of gesture when soliciting information or yes/no responses from Participant B (query-type moves).



This is illustrated in excerpt 5.2.1f (FN; session 4; The Squirrel Story). The full transcript of this interaction is shown in appendix C1.7 (p.324).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
56	NS	could they get through the fence?		QYN
57	AS	(point) (*unintelligible speech) (.) get through	points to page	RY
58	NS	could they get through?		QYN
59	AS	yeh (point) (..) (*unintelligible speech) (.) through	points to page	RY
60	NS	but what happened to him? (point)	points to page	QW
61	AS	stuck		RW
62	NS	he got stuck (point) (..) why?	points to page	A QW
63	AS	because (..) (*unintelligible speech)		RW
64	NS	what? (*laughs) (.) he'd		QW QC
65	AS	(*unintelligible speech)		RW
66	NS	had he eaten so much		QYN
67	AS	(point)	points to page	In
68	NS	what had he been eating?		QW
69	AS	(point) (*unintelligible speech) (.) a worm	points to page	In
70	NS	there's a worm in an apple (.) (point) yes I think they left that apple because there's a worm in it	points to page	A Co
71	NS	but what had they done with all the others? (point)	points to page	QW

Excerpt 5.2.1f Transcription example showing AS and NS use of pointing during fictional narrative construction

Both interlocutors also employed the opening and closing of the storybook as a communicative act. The NS used this to encourage AS initiation of the narrative (opening the book) as a type of preparatory move, gaining the AS' attention, or to end the narrative (closing the book). The AS employed this at the end of one of the four fictional narratives to indicate he had finished narrative construction. This further evidences the impact of the fictional stimuli on the use of communicative modalities, which will be explored further in Chapter Six (Discussion).

There were resonances in the use of environmental reference hand gestures between the interlocutors under both narrative conditions. This was observed in co-occurrence with more than one linguistic move-type. During fictional narrative this was most frequently with the linguistic move ‘acknowledge’ (A) as part of feedback provision, see excerpt 5.2.1f line 70. However, during Participant B’s third personal narrative construction, on the subject of ‘Pets’, the AS produces a gesture indicating ‘listen’, which is copied by the NS alongside a query-type move.

The personal narrative condition impacted on the gestures used by both interlocutors. During personal narrative, both interlocutors employed gesture that role-played a part of the narrative in three of the four recorded interactions. The AS and NS produced these gestures conjointly, when one interlocutor initiated a gesture in conjunction with the provision of narrative information. This is shown in excerpt 5.2.1g (PN; Session 2; ‘a Christmas’). Co-construction of the narrative is evidenced through both speech, NS questions and AS responses, and use of gesture (lines 48 – 50).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
46	AS	(*vocalisation) (.) can you help me?		QYN
47	NS	can I help you? (.) can I help you do what?		C QW
48	AS	pull (..) pull	puts hand out	RW
49	NS	pull (.) what are we going to <u>PULL</u> ?	puts hand out to gesture pulling	A QW
50	AS	the cracker <u>PULL</u>	takes NS hand	RW
51	NS	we are going to pull the cracker (.) ready?		A R
52	NS	1 (.) 2 (.) 3 (.) <u>BANG</u> (..) oh <u>WHAT DID YOU GET IN YOUR CRACKER?</u>	releases AS hand suddenly NS holds hand out	In QW
53	AS	(*unintelligible speech)		RW
54	NS	something to go on <u>HERE?</u>	NS touches AS on the head	QW
55	AS	a hat		RW

Excerpt 5.2.1g Use of co-operative gesture by both interlocutors under the personal narrative condition

Excerpt 5.2.1h (PN; Session 1; ‘a Birthday’) highlights the same phenomena. However, the gesture is initiated by the NS in line 96 to elicit further

narrative information. The NS acknowledges the narrative information provided by the AS (line 96). She then extends the narrative information provided by the AS through the use of co-operative gesture, 'explain' (Ex) and 'instruct' (I) moves (lines 96 and 98).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
93	NS	so you had 10 candles (.) and what did you have to do with the candles?		S QW
94	NS	did you blow them out?		QYN
95	AS	yeh		RY
96	NS	CANDLES go on then (.) these are your candles	holds up hands and wiggles fingers to indicate candles	I Ex
97	AS		blows toward NS hand	RI
98	NS	ooh (.) oh <u>SOME HAVE GONE BUT NOT ALL OF THEM</u> (.) (.) blow them again	blows towards hand  puts some fingers down but keep others up	Ex I
99	AS		blows towards NS hand	RI
100	NS	oh that's better they're all gone now	puts all fingers down as AS blows	Co

Excerpt 5.2.1h Example of NS initiated co-operative gesture under the personal narrative condition

### Summary

Despite the presence of the communication aid, the multi-modal nature of communication appears to be critical to the functions of the linguistic move-types. The NS employed pointing gesture in order to request information, in conjunction with query-type moves, or to provide instruction alongside moves coded 'instruct'. The AS used the same gesture to provide context to 'inform' and response moves when providing narrative information.

Eye-gaze, although coded as one of the most frequently employed modalities, could not be consistently linked to one form of linguistic move-type. However, both interlocutors were found to employ 'eye gaze-person' in conjunction with response and feedback move-types, suggesting use as part of

confirmation. The NS also employed 'eye gaze-person' when trying to gain the AS' attention, as shown in excerpt 5.2.1d.

The narrative condition was found to impact on the co-occurrence of specific communicative modalities and linguistic move-types. During fictional narrative the presence of a storybook stimulus lead to increased use of environmental reference. Under the personal narrative condition, co-operative role-play gestures were observed with increased frequency. Both types of gesture were employed in conjunction with the same linguistic move-types; query-type and 'instruct' moves for the NS and 'inform' or response-type moves for the AS.

### **5.2.2 Participant 'S'**

Participant S was a 12;08 year old girl with a diagnosis of spastic cerebral palsy. She had diplegia and limited use of her arms. She used a manual wheelchair with support from an assistant. She had no reported sensory impairments. Participant S was recorded at P8 to level 1 for her receptive language and P7 in expressive language (see appendix A2 for P level descriptors). She was able to consistently link 2-3 symbols using AAC and would produce longer phrases if the desired vocabulary was available. Participant S used an Alea Intelligaze™ on a Powerbox 7™ AAC device, which was accessed using eye gaze (see appendix B8). She had been using this device for a total of four months. Participant S was unable to produce verbal communication but made use of eye-pointing, gesture, facial expression and vocalisation alongside the AAC device.

The NS working with Participant S was female. She had the job title of 'Communication Specialist Teaching Assistant'. She had been working with Participant S for a minimum of three hours per week over three years. The NS had a total of nine years' experience working with individuals with SEND, of which six years had been assigned to individuals using different types of AAC.

A total of four fictional narratives and three personal narratives were recorded for Participant S over the four data collection sessions. It was not possible to capture a personal narrative at the fourth session as Participant S was

too fatigued. For this reason the fictional only data from the fourth session was omitted from analysis and means were taken across the three complete sessions.

### *RQ1 Communicative Roles - Linguistic Move-Type*

The first set of results is for the measure of linguistic moves as shown in table 5.2.2a on the next page.

<b>Linguistic Move-Type</b>		<b>AS</b>		<b>NS</b>	
Prep	Ready	-	-	5.33	(0-9)
	Instruct	-	-	26.67	(0-20)
Initiation	Explain	-	-	55.33	(0-48)
	Inform	11.00	(1-14)	3.67	(0-3)
	Check	0.33	(0-1)	24.00	(0-19)
	Align	-	-	0.33	(0-1)
	Query-YN	-	-	94.67	(0-105)
	Query-W	-	-	33.67	(0-34)
	Query-Choice	-	-	17.33	(0-17)
	Query-Completion	-	-	0.67	(0-1)
	Request help	7.00	(2-6)	-	-
	Acknowledge	7.00	(0-12)	113.00	(0-82)
	Object	0.33	(0-1)	0.33	(0-1)
Response	Reply-Y	60.67	(3-67)	-	-
	Reply-N	20.67	(1-24)	-	-
	Reply-W	15.67	(0-23)	-	-
	Response to instruction	19.67	(2-17)	-	-
	Reply-Choice	13.33	(0-12)	-	-
	Reply-Completion	0.33	(0-1)	-	-
	Clarify	-	-	-	-
	Praise	-	-	42.00	(0-36)
	Comment	1.67	(0-2)	52.00	(0-44)
	Summarise	0.67	(0-2)	8.00	(0-9)
	Other	Repetition	-	-	-
Operation of device-Other		-	-	-	-
NPC		4.33	(0-9)	0.67	(0-1)
Summary	Mean Preparation Moves	-	-	5.33	
	Mean Initiation Moves	13.00		256.33	
	Mean Response Moves	140.00		215.33	

Table 5.2.2a Summary of mean (range) coded instances of linguistic move-types and other coded categories

There was a mean of 635 coded instances for the three data collection sessions (AS<NS = 157.33<477.67) showing a notable difference of 320.33 between the interlocutors. There was a mean of 630 coded linguistic moves

(AS<NS = 153.00<477.00) showing a similar difference of 324 between the interlocutors. Initiation move-types revealed the greatest disparity between interlocutors (AS<NS = 13.00<256.33) showing a difference of 243.33 in the mean coded instances.

The most frequently occurring linguistic move-types employed by the interlocutors (from highest to lowest) were as follows: AS: 'reply-Y'=60.67 (40.03%); 'reply-N'=20.67 (13.13%); 'response to instruction'=19.67 (11.83%); 'reply-W'=15.67 (8,27%); NS: 'acknowledge'=113 (24.13%); 'query-Y/N'=94.67 (20.43%); 'explain'=55.33 (10.03%); 'comment'=52 (10.82%). The high frequency of AS 'reply-Y' and 'reply-N' moves is likely to be linked to the NS frequent use of 'query-Y/N'.

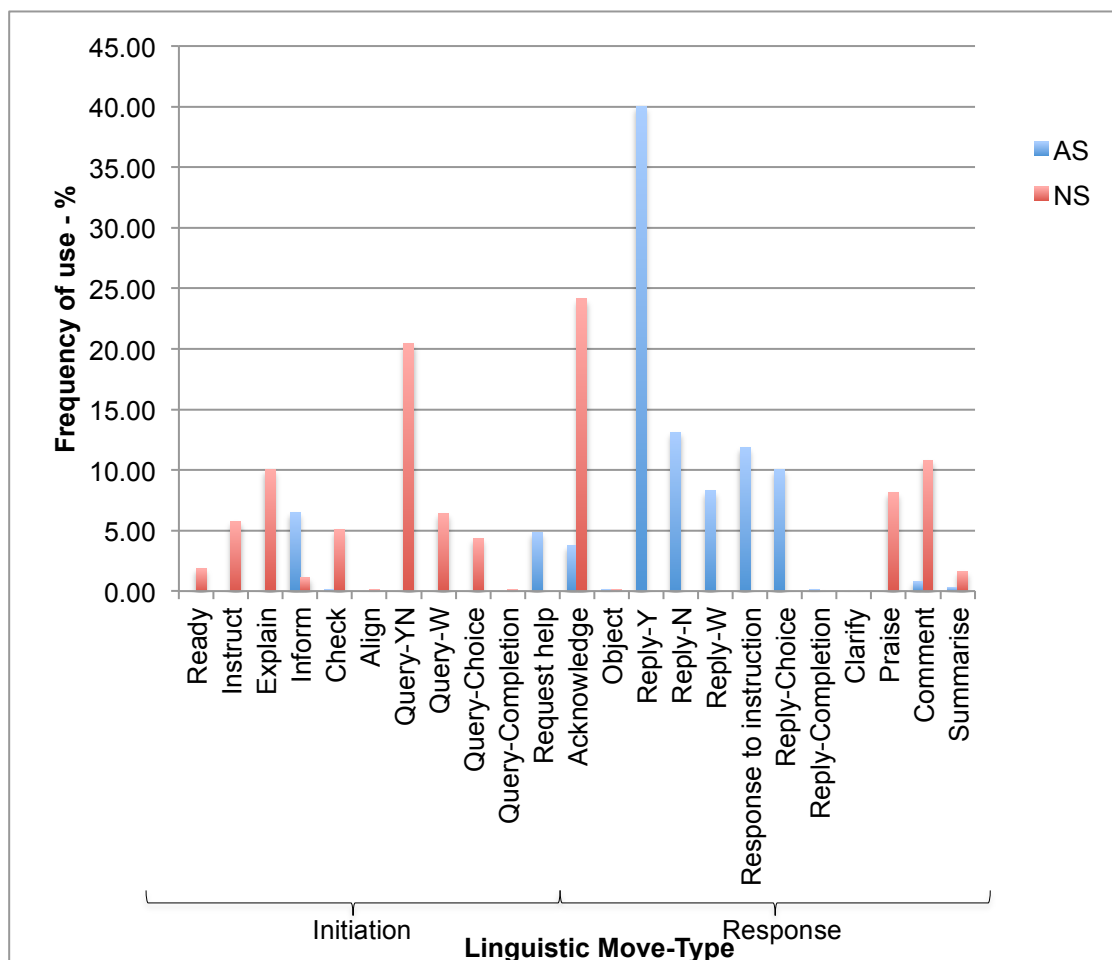


Figure 5.2.2a Distribution of Linguistic Move-types (%) across three completed data collection sessions

As shown in Figure 5.2.2a the NS made almost all initiation-type moves during the narrative constructions (AS<NS = 13.00<256.33). The only initiations

produced by the AS were employed to request help or provide narrative content ('inform'). The AS employed more responses to query-type moves than the NS. Expected initiation-response move pairings between the AS and NS were shown in the most frequently occurring move-types, as shown above. The difference between ranges for each linguistic move code revealed considerable variation across the three data collection sessions: AS: 'reply-Y'=64; 'reply-W'=23; 'reply-N'=23; NS: 'acknowledge'=101; 'query-Y/N'=96; 'comment'=43; 'explain'=42.

Excerpt 5.2.2a (PN; Session 2; 'a Birthday') shows the NS' frequent use of comments during long pauses throughout AS 'AAC-encoding' and arising technical difficulties. Full definitions of linguistic move-type codes shown in the excerpt below are presented in appendix B11.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
218	AS	(*VOCALISATION) (nods)		RY
219	NS	yes (.) right you need to go back  (.) and it's actually that one (points to icon on screen)	accesses device and changes page	A Ex
220	NS	see if you can get it (.) you struggle down the bottom there don't you sometimes		I Co
221	AS		accesses device and highlights icon	RI
222	NS	oh go on prove me wrong (*laughs) (.) oh nearly just up a fraction you're just below it (point) (.) now you're next to it	points to device screen	Co Ex Ex
223	AS		selects unwanted icon and changes page	
224	NS	try again (point) (.) in there	accesses device and changes page back points to device screen	I Ex
225	NS		accesses device and highlights icon	RI
226	NS	ooh and you're on it (.) it's frozen (.) d'you want me to select <u>THAT</u> (point) (.) cos you were on it (.) Is that ok?	points to specific button on device screen	Co QYN C
227	AS	'yes' (nods)		RY

Excerpt 5.2.2a Transcription example showing NS use of 'comment' moves in response to pause and technical difficulty during narrative interaction

Considerable difference was found between the most frequently employed move-types across interlocutors. The NS made substantially more linguistic moves than the AS, especially initiation-type moves (AS<NS = 13.00<256.33). Expected initiation-response pairs were observed within the highest occurring move types, e.g. NS use of yes/no questions ('query-Y/N') followed by yes or no responses from the AS ('reply-Y'; 'reply-N'). The most frequently employed linguistic move-types were those with the greatest variation as indicated by range.

### *RQ2 Narrative Conditions – Linguistic Move-Type*

The second set of results is for the measure of linguistic move-types across the two narrative conditions as shown in table 5.2.2b.

	Linguistic move	Personal (PN)				Fictional (FN)			
		AS		NS		AS		NS	
Prep	Ready	-	-	1.33	(0-3)	-	-	4.00	(0-9)
	Instruct	-	-	14.67	(4-20)	-	-	12.00	(4-19)
	Explain	-	-	27.00	(22-32)	-	-	28.33	(6-48)
	Inform	4.67	(1-9)	1.33	(0-3)	6.33	(1-14)	2.33	(1-3)
	Check	-	-	14.67	(8-19)	0.33	(0-1)	9.33	(1-15)
	Align	-	-	0.33	(0-1)	-	-	-	-
	Query-YN	-	-	59.67	(15-105)	-	-	35.00	(9-63)
	Query-W	-	-	9.33	(4-20)	-	-	24.33	(8-34)
	Query-Choice	-	-	9.33	(7-13)	-	-	8.00	(0-17)
	Query-Completion	-	-	0.33	(0-1)	-	-	0.33	(0-1)
	Request help	3.67	(2-6)	-	-	3.33	(2-5)	-	-
Initiation	Acknowledge	2.67	(1-6)	55.00	(32-75)	4.33	(0-12)	58.00	(17-82)
	Object	0.33	(0-1)	-	-	-	-	0.33	(0-1)
	Reply-Y	38.67	(10-67)	-	-	22.00	(3-40)	-	-
	Reply-N	15.00	(6-24)	-	-	5.67	(1-8)	-	-
	Reply-W	2.33	(0-6)	-	-	13.33	(5-23)	-	-
	Response to instruction	10.33	(2-17)	-	-	9.33	(6-13)	-	-
	Reply-Choice	8.00	(6-12)	-	-	5.33	(0-10)	-	-
	Reply-Completion	0.33	(0-1)	-	-	-	-	-	-
	Clarify	-	-	-	-	-	-	-	-
	Praise	-	-	16.33	(12-20)	-	-	25.67	(10-36)
	Comment	1.33	(0-2)	23.00	(7-40)	0.33	(0-1)	29.00	(6-44)
	Summarise	-	-	2.33	(0-5)	0.67	(0-2)	5.67	(2-9)
	Response	Repetition	-	-	-	-	-	-	-
Operation of device-Other		-	-	-	-	-	-	-	-
NPC		3.33	(0-9)	0.33	(0-1)	1.00	(0-2)	0.33	(0-1)



Summary	Mean Preparation Moves	-	1.33	-	4.00
	Mean Initiation Moves	4.67	136.67	8.33	119.67
	Mean Response Moves	79.00	96.67	61.00	118.67

Table 5.2.2b Summary of mean (range) coded instances of linguistic move-types and other coded categories according to narrative condition

The mean of coded instances for the two narrative conditions was 635 (PN>FN = 322.00>313.00) showing a difference of 9 between the conditions. There was a mean of 630 linguistic moves coded (PN>FN = 318.33>311.67) showing a difference of 6.67 between the conditions. In terms of linguistic move-types, mean initiation moves showed the greatest disparity across the two conditions, (PN>FN = 141.33>128.00) a difference of 13.33 coded instances.

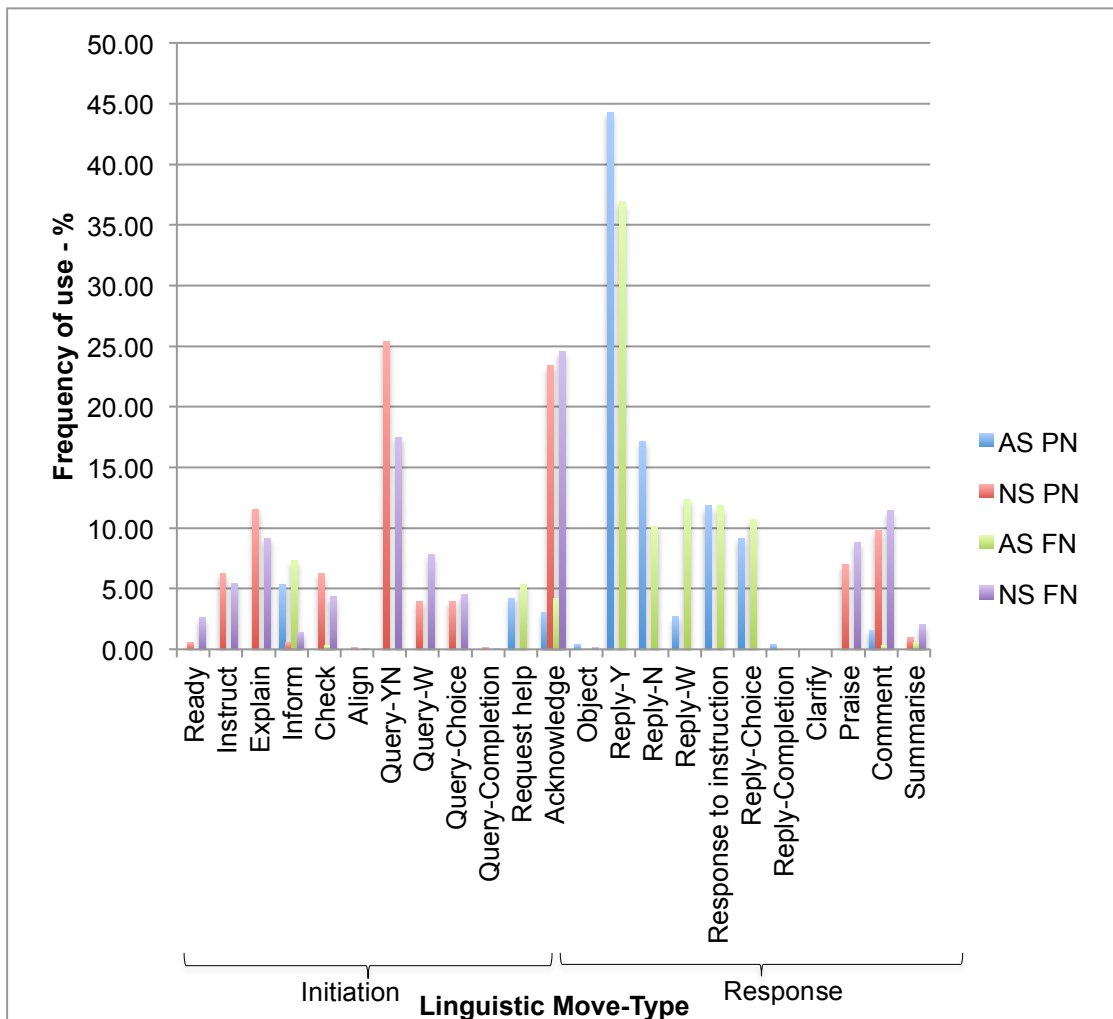


Figure 5.2.2b Distribution of Linguistic move-types by narrative condition for both interlocutors

Figure 5.2.2b highlights the linguistic move-type use of both interlocutors between narrative conditions. The biggest differences between the interlocutors by condition were for PN: 'query-Y/N': AS<NS = 0<59.67 (25.43%); 'acknowledge': AS<NS = 2.67 (3,05%)<55.00 (23.44%); 'reply-Y': AS>NS = 38.67 (44.27%)>0. For the FN condition it was: 'acknowledge': AS<NS = 4.33 (4.23%)<58.00 (24.54%); 'query-Y/N': AS<NS = 0<35.00 (17.48%); 'comment': AS<NS = 0.33 (0.28%)<29.00 (11.43%); 'praise': AS<NS = 0<25.67 (8.82%).

When the data are separated by narrative condition, the majority of linguistic move-types are employed with similar frequency. This is shown both between interlocutors by condition and in mean linguistic move-types shown in table 5.2.2b (p.148). The same linguistic moves showed greatest differences between interlocutors under both conditions.

Coding of linguistic move-types showed variation between conditions; for the AS: PN>FN = 83.67>69.33 showing a difference of 14.33 between conditions; NS: PN<FN = 234.67<242.33 showing a difference of 7.67 between conditions.

Figure 5.2.2b also shows very few notable differences recorded for the AS according to condition when comparing individual linguistic move-types. The largest were 'reply-Y': PN>FN = 38.67 (44.27%)>22.00 (36.90%); 'reply-W': PN<FN = 2.33 (2.67%)<13.33 (12.39%). For the NS, coding of the linguistic moves also showed limited variation between the conditions: 'query-Y/N': PN>FN = 59.67 (25.43%)>35 (17.48%); 'query-W': PN<FN = 9.33 (3.98%)<24.33 (7.82%).

When linguistic move-type frequency is inspected according to narrative condition (PN or FN) and interlocutor (AS or NS), limited differences are shown between the two narrative conditions. Differences between individual codes were also few for both interlocutors.

### *RQ2 Narrative Conditions - Linguistic Complexity*

The following set of data provides evidence in response to RQ2. Table 5.2.2c presents the measures used to investigate the linguistic complexity of Participant S' narrative contributions

	Personal		Fictional	
<b>Mean Content Words</b>	14.33	(3-22)	35.67	(8-59)
<b>Mean Function Words</b>	1.67	(0-3)	-	-
<b>Mean Total Words</b>	16.00	(3-24)	35.67	(8-59)
<b>Mean Different Words</b>	9.00	(3-12)	14.33	(8-19)
<b>Type Token Ratio (TTR)</b>	0.56		0.40	

Table 5.2.2c Summary of mean (range) measures of linguistic complexity across four data collection sessions

There was a mean of 51.67 recorded words for the three data collection sessions (PN<FN = 16.00<35.67) showing a difference of 19.67 between the two narrative conditions. A mean of 23.33 different words were recorded across the three sessions (PN<FN = 9.00<14.33) showing a small difference of 5.33 between conditions. A clear disparity is evident between the mean content and function words under both conditions: PN: content words>function words = 14.33>1.67; FN: content words>function words = 35.67>0.

Excerpt 5.2.2b (FN; Session 3; 'Peter and the Cat') serves to highlight the AS's sole use of content words under the fictional narrative condition. The AS was summarising (S) the story so far, by selecting the 'speak' command button on her AAC device. Each word shown had been produced as a single AAC-output prior to this point in the interaction.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
128	AS	<i>'Peter boy tall boy cat parrot climb tree cat shocked hold shout'</i>		S

Excerpt 5.2.2b AS fictional narrative contribution, showing high frequency of content word use

The difference between minimum and maximum occurrences (range) of total, and content words revealed considerable variation across the three data collection sessions: total words: PN=21; FN=51; content words: PN=19; FN=51.

The personal narrative sample for TTR calculation did not reach the 100 token recommendation of Fletcher (1985) and must therefore be considered subjective. The TTR calculated for personal narrative construction (TTR=0.56) shows a higher TTR value than that for fictional narrative (TTR=0.40). This may be as a result of the lower total words sample in the personal narrative condition.

## Summary

The NS recorded the majority of moves made during narrative construction. This was shown in both initiation and response type-moves. The AS made few initiations, only employing 'inform', 'check' and 'request-help' moves, but was coded using ten of the twelve response type-moves. In contrast, the NS was coded using nine of the ten possible initiation type-moves and only five of the twelve possible response move codes. The NS was the only participant to use preparation-type moves across all interactions. A higher mean was recorded for NS use of 'acknowledge', 'praise' and 'comment' moves, indicating the NS provision of feedback. No notable difference was found in the data across narrative conditions.

The linguistic complexity data showed the AS to produce a higher mean number of words during fictional narrative construction. No function words were recorded under the fictional condition, and only minimal function word use was shown during personal narrative. The AS predominantly employed content words, an example of which is shown in excerpt 5.2.2b.

## RQ1 Communicative Roles - Communicative Modality

The first set of results for the measure of communicative modalities is shown below in table 5.2.2d.

	<b>Codes</b>	<b>AS</b>		<b>%</b>	<b>NS</b>		<b>%</b>
Communicative Modality	Speech	-	-	-	73.33	(12-57)	23.73
	Vocal Gesture	8.33	(0-15)	3.71	3.67	(0-6)	1.19
	Co-Action	0.67	(0-2)	0.30	0.67	(0-2)	0.22
	AAC-Encoding	25.33	(4-22)	11.28	3.00	(0-4)	0.97
	AAC-Output	2.67	(0-3)	1.19	0.33	(0-1)	0.11
	Eye Gaze - Person	51.33	(6-61)	22.85	84.00	(12-75)	27.18
	Eye Gaze - Device	116.00	(26-93)	51.63	99.00	(19-94)	32.04
	Eye Gaze - Other	8.33	(0-13)	3.71	10.67	(0-11)	3.45
	Facial & Body Gesture	12.00	(1-17)	5.34	12.67	(0-19)	4.10
	Sign	-	-	-	2.33	(0-3)	0.76
	Env. Reference	-	(0-1)	-	19.33	(1-18)	6.26
Other	Neutral	5.67	(0-9)	-	0.67	(0-2)	-
	NPC	1.33	(0-2)	-	0.33	(0-1)	-

Table 5.2.2d Summary of mean (range) coded instances of communicative modalities and other coded categories.

There was a mean of 541.67 coded instances for the three data collection sessions (AS<NS = 231.67<310.00) showing a difference of 78.33 instances between the interlocutors. There was a mean of 533.67 codings of communicative modalities (AS<NS = 224.67<309.00) showing a notable difference of 84.33 between the interlocutors. Multiple communicative modalities were used by both interlocutors: AS<NS =9<11 with a difference of 2.

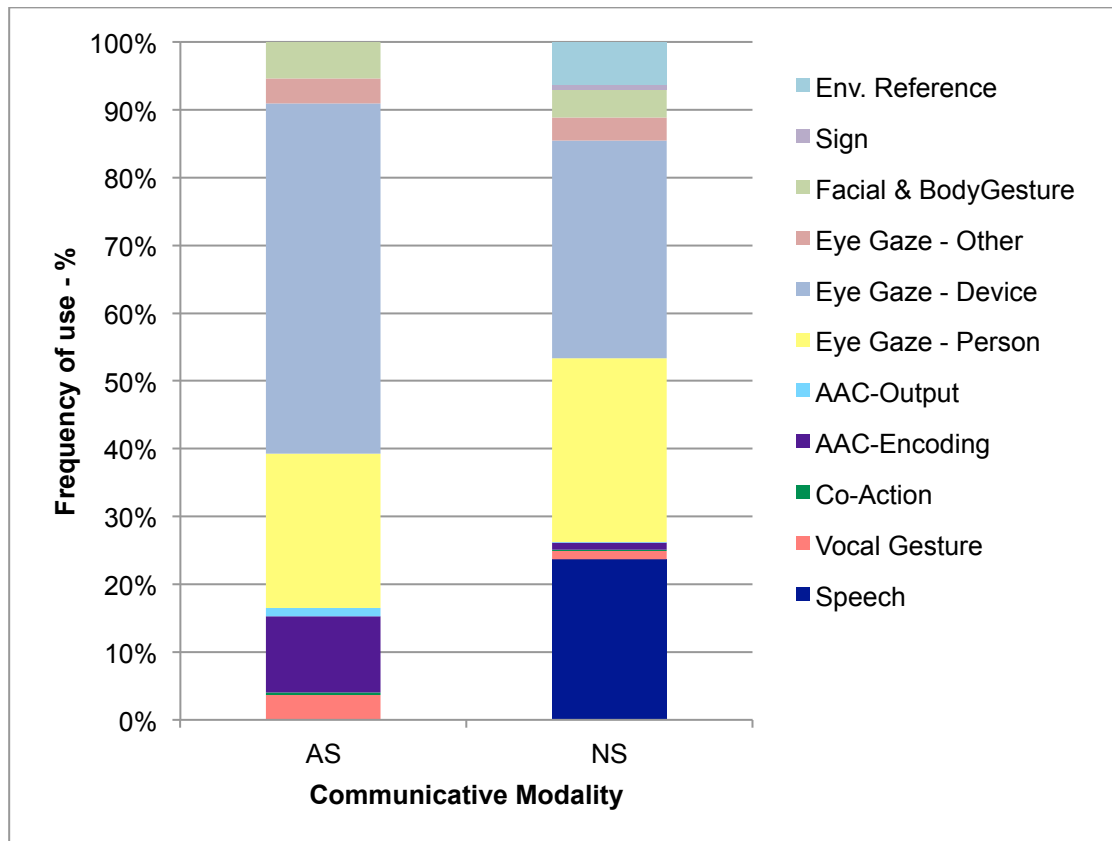


Figure 5.2.2c Distribution of communicative modalities according to interlocutor - %

Figure 5.2.2c shows the distribution of communicative modality use by interlocutor-type as percentages for the three completed sessions. Over half the coded instances of 'communicative modalities' for the AS were 'eye gaze-device' (51.63%). This may be due to her use of eye gaze as an access method. In contrast, the coded instances for the NS were mainly spread over three modalities: 'eye gaze-device'=32.04%; 'eye gaze-person'=27.18%; 'speech'=23.73%.

The most frequently occurring communicative modalities employed by the interlocutors (from highest to lowest) were as follows: AS: 'eye gaze-device'=116.00 (51.63%); 'eye gaze-person'=51.33 (22.85%); 'AAC-encoding'=25.33 (11.28%); NS: 'eye gaze-device'=99.00 (32.04%); 'eye gaze-person'=84.00 (27.18%); 'speech'=73.33 (23.73%).

The difference between minimum and maximum occurrences (range) for each communicative modality reveals considerable variation across the three data collection sessions: AS: 'eye gaze-device'=67; 'eye gaze-person'=55; 'AAC-encoding'=18; NS: 'eye gaze-device'=75; 'eye gaze-person'=63; 'speech'=45.

Modalities relating to eye gaze were used most frequently by both interlocutors, in the same ranked order. The eye gaze-type modalities were also those with the greatest variation as indicated by range. A link may be seen between the third most frequently used modality between interlocutors; 'AAC-encoding' may be the AS equivalent of the NS 'speech' coded.

Excerpt 5.2.2c (PN: Session 2; 'A Birthday') shows the frequent use of eye gaze by both interlocutors, towards the device and towards each other. Due to the AS' use of eye gaze to access her AAC device the direction of her gaze is assumed as towards the device during all access attempts, as shown in line 195. The transcribed instances of eye gaze indicate the different linguistic uses of this communicative modality. This is explored further in the following section where both communicative modality and Linguistic move codes are examined together.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
187	NS	I could be really cruel and say you've got to select that first (point)	points to device screen	Co Ex
188	AS		looks at NS	RH
189	NS	d'you want me to select that first?		QYN
190	AS	(*VOCALISATION) (nods)		RY
191	NS	yes (.) yes (.) so it was 'it was' (.) and then you put	looks at AS	A Ex
192	AS	['it was']		In
193	NS	and then you've managed it (.) I'll get rid of one (.) that's my one	looks at device and accesses, deletes repeat	Co Ex

194	NS	so it was funny (point) (.) it was	points to device screen	A QC
195	AS		accesses device and highlights icon	RC
196	NS	ok (.) exciting was it		A Co
197	AS		looks away before selecting icon then looks at NS	
198	NS	or surprise (.) was it a surprise for you too? (.) was it?		QYN C
199	AS	'yes' (nods)		RY

Excerpt 5.2.2c Transcription example of AS and NS high frequency eye-gaze use during narrative construction

Coded instances of 'AAC-encoding' and 'AAC-output' revealed notable differences between the two for the AS: 'AAC-encoding' > 'AAC-output' = 25.33 > 2.67, although 'AAC-encoding' varied considerably across the three sessions as indicated by the range (4-22). The NS also had some minimal input to 'AAC-encoding'=3.00, and 'AAC-output'=0.33.

#### RQ2 Narrative Condition – Communicative Modality

In order to address RQ2, the following set of results is presented for the measure of communicative modalities as shown in table 5.2.2e.

Codes	Personal						Fictional					
	AS		%	NS	%		AS	%	NS	%		
Speech	-	-	-	35.00	(19-56)	23.92	-	-	-	38.33	(12-57)	23.57
Vocal Gesture	7.00	(0-15)	6.29	2.00	(0-6)	1.37	1.33	(0-2)	1.18	1.67	(1-2)	1.02
Co-Action	0.67	(0-2)	0.60	0.67	(0-2)	0.46	-	-	-	-	-	-
AAC-Encoding	12.67	(4-22)	11.38	1.67	(1-2)	1.14	12.67	(6-19)	11.18	1.33	(0-4)	0.82
AAC-Output	-	(0-1)	0.60	-	-	-	2.00	(0-3)	1.76	0.33	(0-1)	0.20
Eye Gaze - Person	33.00	(11-61)	29.64	48.00	(26-75)	32.80	18.33	(6-27)	16.18	36.00	(12-48)	22.13
Eye Gaze - Device	49.00	(28-64)	44.01	36.67	(19-50)	25.06	67.00	(26-93)	59.12	62.33	(19-94)	38.32
Eye Gaze - Other	0.33	(0-1)	0.30	2.67	(0-6)	1.82	8.00	(0-13)	7.06	8.00	(3-11)	4.92
Facial & Body Gesture	8.00	(1-17)	7.19	9.00	(4-19)	6.15	4.00	(1-6)	3.53	3.67	(0-10)	2.25
Sign	-	-	-	1.00	(0-2)	0.68	-	-	-	1.33	(0-3)	0.82
Env. Reference	-	-	-	9.67	(5-17)	6.61	-	-	-	9.67	(1-18)	5.94
Other	Neutral	0.67	(0-2)	-	0.67	(0-2)	-	5.00	(0-9)	-	-	-
	NPC	0.67	(0-2)	-	-	-	-	0.67	(0-2)	-	0.33	(0-1)

Table 5.2.2e Summary of mean (range) coded instances of each communicative modality and other coded categories according to narrative condition

The mean of coded instances for the two narrative conditions was 541.67 (PN<FN = 259.67<282.00) showing a difference of 22.33 between the conditions. During the three sessions there was a mean of 533.67 codings of communicative acts (PN<FN = 257.67<276.00) showing a difference of 18.33 between the narrative conditions.

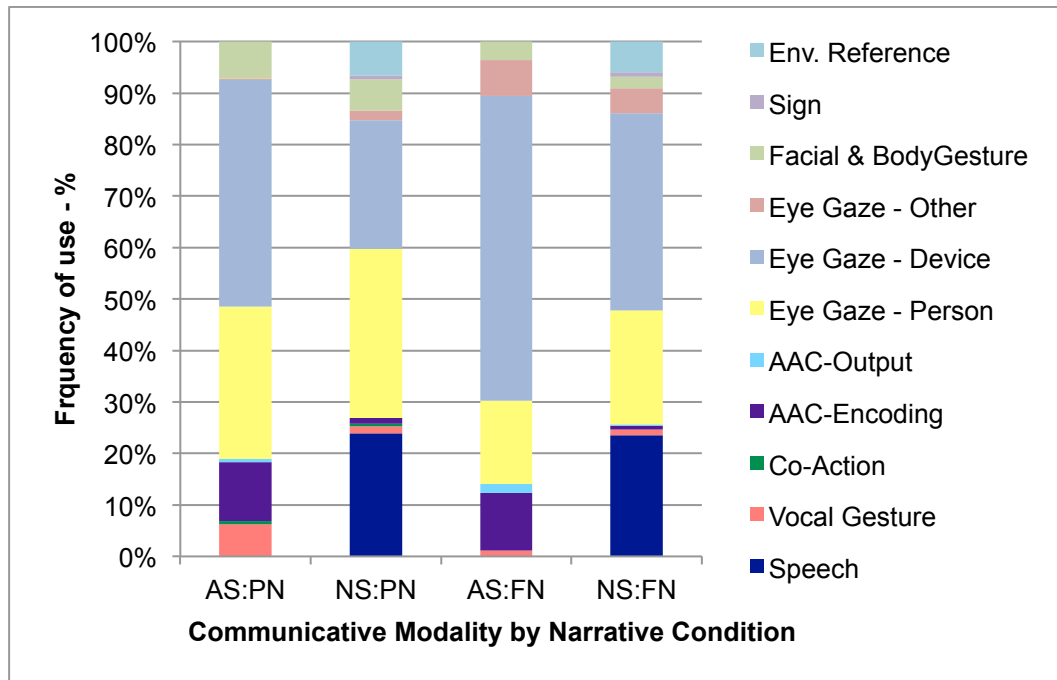


Figure 5.2.2d Distribution of communicative modalities between narrative conditions, according to interlocutor - %

As shown in figure 5.2.2d, the biggest differences between the interlocutors by condition were for PN: 'speech: AS<NS = 0<35.00 (23.92%); 'eye gaze-person': AS<NS = 33.00 (29.64%)<48.00 (32.80%); 'eye gaze-device': AS>NS = 49.00 (44.01%)>36.67 (25.06%); 'AAC-encoding': AS>NS = 12.67 (11.38%)>1.67 (1.14%). For the FN condition it was: 'speech': AS<NS = 0<38.33 (23.57%); 'eye gaze-person': AS<NS = 18.33 (16.18%)<36.00 (22.13%) and 'AAC-encoding': AS>NS = 12.67 (11.18%)>1.33 (0.82%). Three of the same communicative modalities were shown to have the largest between interlocutor differences under both conditions.

When the data are separated by narrative condition, figure 5.2.2d highlights a number of differences between the use of communicative modalities by each interlocutor. The mean coded instances and mean communicative acts show only small differences between the conditions.



Analysis of the conditions by interlocutor show that codings of communicative modalities varied according to condition, for AS: PN>FN = 112.67>111.33; NS: PN<FN = 147.00<163.00. The biggest differences between the conditions by interlocutors were for AS: 'eye gaze-device': PN<FN = 49.00 (44.01%)<67.00 (59.12%); 'eye gaze-person': PN>FN = 33.00 (29.64%)>18.33 (16.18%); for NS: 'eye gaze-device': PN<FN = 36.67 (25.06%)<62.33 (38.32%); 'eye gaze-person': PN>FN = 48.00 (32.80%)>36.00 (22.13%).

When the individual communicative modality frequency is inspected according to narrative condition (PN or FN) and interlocutor (AS or NS), there are few notable differences. The infrequent differences shown may be due to the presence of stimuli under the fictional narrative condition. This will be explored within Chapter Six (Discussion p.200).

### *Summary*

The NS produced higher mean coded instances and coded communicative acts than the AS under both narrative conditions. Both interlocutors employed multiple communicative modalities during all narrative constructions. Eye gaze towards the device or person showed the highest mean coding for both interlocutors. The AS also employed a high mean 'AAC-encoding' acts and the NS produced a high mean coded 'speech' acts. Range values calculated showed considerable variation across data collection sessions.

Limited differences were identified between narrative conditions. A slightly higher mean communicative acts was recorded for the fictional narrative condition (PN<FN = 257.67<276.00). Any difference recorded between conditions for individual communicative acts were shown across both interlocutors. For example, both the AS and NS recorded higher mean coded instances for 'eye gaze-device' under the fictional condition and higher mean coded instances of 'eye gaze-person' under the personal narrative condition.

### *RQ3 Integrated Profile of Narrative Construction*

Annotation of non-vocal acts on to the transcripts highlighted a number of links between the use of communicative modalities and linguistic-move types. More notable links between outcome measures were identified for the NS. This

was due to the impact of the AS' physical disability on her ability to produce a number of the coded communicative modalities. For example, body gestures were found to show the most links with specific linguistic move-types, but this type of modality was not accessible to the AS. Each identified pattern of linguistic move and communicative modality are presented alongside excerpts from the full transcripts (appendices - Section C).

- *Use of eye gaze*

Eye gaze-type moves showed some of the highest mean coded instances across all recorded narrative constructions. For the NS no clear links could be identified between the use of eye gaze and specific linguistic move-types. For the AS, requests for help were always coded alongside the use of eye gaze and often vocalisation towards the NS. The AS also employed eye gaze towards the NS when producing yes responses ('Reply-Y') as part of confirmation. Both pairings of eye gaze towards the NS and linguistic move-types are shown in excerpt 5.2.2d.

Excerpt 5.2.2d (FN; Session 4; 'The Squirrel Story') shows the AS using eye gaze towards the NS in conjunction with a request for help ('RH' line 27) and a yes response as confirmation ('RY' line 33). Full definition of the linguistic move-type codes can be found in appendix B11.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
27	AS		highlights but moves gaze from symbol before selecting then looks at NS	RH
28	NS	uh getting closer	gives eye contact	Co
29	AS		struggles to access device	
30	NS	you see the red dot that's where you're actually looking (point) (..) you need to come <u>DOWN</u> a bit (..) come down to here (..) that's it	points to device screen points then gestures down screen with hand	Ex I I A
31	AS		highlights but moves gaze from symbol before selecting	RI
32	NS	right i'm gonna select that		A

		for you cos you've been on that 3 times now	looks at AS	Ex
33	AS	['yes' (nods)]	gives eye contact	RY

Excerpt 5.2.2d Transcription example showing AS uses of 'eye gaze-person' with 'RH' and 'RY' linguistic move-types

Eye gaze towards the other interlocutor ('eye gaze-person') was employed to produce responses to choice questions ('RCH' moves). The AS always looked towards the NS when providing choice responses ('RCH' moves) following the NS use of hand gesture to offer the choice ('query-choice' – 'QCH'). The NS used each hand to represent a single option, requiring the AS to look toward one hand to communicate her choice. This showed the NS use of non-verbal access methods to facilitate the AS' responses, which will be discussed further in Chapter Six (Discussion). This co-operative choice making process is shown in excerpt 5.2.2e (PN; Session 1; 'a Christmas'). The excerpt highlights the importance of this linguistic move-type in conjunction with non-verbal communication methods to support the AS in providing narrative information.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
295	NS	just <u>YOU</u> or everybody?	points at AS	QCH
296	AS	(*vocalisation)		RCH
297	NS	<u>JUST S HAD A STOCKING</u> (.) <u>EVERYBODY HAD A STOCKING</u>	holds up hands to represent each choice	QCH
298	AS		looks at hand representing everybody	RCH
299	NS	(nods) <u>YEH</u> (.) so where was your stocking? (.) <u>WAS IT BY YOUR BED</u> (.) <u>OR DOWNSTAIRS?</u>	holds up hands to represent each choice	A QW QCH
300	AS		looks at hand representing downstairs	RCH
301	NS	sownstairs (.) so do <u>YOU</u> just open your stocking presents in the morning?	points at AS	A QYN
302	AS	(*vocalisation)		NPC
303	NS	<u>YES</u> (.) <u>OR NO</u>	holds up hands to represent each choice	QCH
304	AS		looks at hand representing no	RCH

Excerpt 5.2.2e Use of hand gesture and 'eye gaze-person' in conjunction with the initiation-response pair 'query-choice' (QCH) - 'reply-choice' (RCH)

- *Use of gesture*

The NS employed a high frequency of hand gestures during narrative construction. Some manual signing (Makaton) was used to emphasise key words, but review of annotations showed no clear links with specific linguistic move-types. Pointing by the NS towards objects or points of interest ('environmental reference') was observed in all narrative constructions. The NS pointed to the AAC device in conjunction with explanation (Ex) moves in order to support the AS' device use. Pointing towards a button on the device may have been employed by the NS to direct the AS' gaze in order to access the communication aid. NS pointing towards the storybook stimulus was also observed under the fictional narrative condition. This gesture was employed in conjunction with two types of linguistic move: query-type moves providing context to a question, or co-occurring with acknowledgement ('acknowledge' (A)) and comments ('comment' (Co)), which provided more specific feedback to the AS. Excerpt 5.2.2f (FN; Session 2; 'The Bus Story') presents evidence of the NS' use of 'environmental reference' toward the device screen whilst providing a verbal explanation ('Ex'; line 317). Lines 321 and 322 demonstrate the NS use of pointing towards the fictional stimulus in conjunction with a W-question (QW) and during feedback provision through acknowledgement (A) and comments (Co) to the AS.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
317	NS	so drive is one of these green ones (point)	points to device screen	Ex
318	AS		accesses device and highlights icon	
319	NS	'yes' (nods) good girl		Pr
320	AS	'drive'		RI
321	NS	so he drive (.) he drove into the river didn't he (..) in there (point)	points to page	A Co
322	NS	who's that sneaking up behind him? (point)	picks up book and points to character	QW
323	NS	is that on there? (.) It's one of the red ones (point)	points to device screen	QYN Ex
324	AS		accesses device and highlights icon	

Excerpt 5.2.2f Transcription example highlighting the co-occurrence of NS pointing gesture with different linguistic move-types

- *AAC device use*

Under both narrative conditions the NS was coded producing AAC-encoding and AAC-output moves. When reviewed on the transcript, NS AAC device use was predominantly recorded in conjunction with comments towards the AS (Co). The NS provided ‘comment’ moves to give information regarding what she was doing, whilst completing AAC access in order to navigate dynamic pages. The AS then used this information to select the relevant narrative vocabulary. The NS use of the AAC device was often linked to AS levels of fatigue, and frequently followed AS requests for help or support (RH). This will be examined further in Chapter Six (Discussion). Excerpt 5.2.2g (FN; session 4; ‘The Squirrel Story’) provides an example of NS device use in conjunction with ‘comment’ (Co) moves. In line 92 the NS completes AAC-encoding to navigate dynamic pages on the AAC device, while providing comments to the AS about the changes she is making. AAC-encoding followed by AAC-output by the NS is shown in lines 99 and 100, again with the NS commenting on the ‘AAC-encoding’ act being made.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
90	NS	are you looking for these characters? (point) (..) is that who you’re looking for?	points to parts of book page	QYN QYN
91	AS	(nods) (*VOCALISATION)	gives eye contact	RY
92	NS	(nods) <u>YEH</u> (.) ok right so go back (.) and again (.) are they in there?	accesses device and changes page accesses device and changes page	A Co QYN
93	AS	‘yes’ (nods slightly)		RY
94	NS	ah (..) you have to remember don’t you there’s lots of things to remember		A Co
95	NS	(*? comment made re. AS and accessing device)	speech too quiet to understand	Co
96	AS		highlights but moves gaze from symbol before selecting	
97	NS	ok		A
98	AS		highlights but moves gaze from symbol before selecting	
99	NS	oh you selected that [i’ll let you have that]	accesses device	A Co

100	NS	['squirrel'] (.) the squirrel what about the squirrel		In
				A
				QW

Excerpt 5.2.2g Transcription example of NS AAC device use during narrative construction

### Summary

Participant S looked towards the NS ('eye gaze-person') in conjunction with requests for help under both narrative conditions. Speech was employed by the NS to produce all linguistic move-types. Hand gesture also showed high frequency use in conjunction with specific linguistic move-types. Environmental reference towards the device was frequently employed when the NS provided an explanation to the AS. When directed at the fictional stimulus, NS pointing was employed with either query-type moves, e.g. 'W-questions' (QW), or as part of feedback provision ('acknowledge', 'comment').

Examination of NS 'query-choice' and AS 'reply-choice' moves showed a co-operative pairing of communicative modality use. The NS consistently employed hand gesture to provide choice options, followed by AS selection using eye-gaze towards the relevant NS hand.

The narrative condition had limited impact on the co-occurrence of communicative modalities and linguistic move-types. The only identified difference was the NS use of pointing toward the fictional stimulus to provide context for some questions and feedback provision. Other communicative modalities were used in conjunction with the same linguistic move-types across both conditions.

### 5.2.3 Participant 'J'

Participant J was a 7;11 year old boy with a diagnosis of ASC who was also reported as fitting the ADHD profile by his teacher, but had not reacted well to medication. He was fully ambulant and had no reported motor or sensory difficulties. Approximately twelve months before data collection, Participant J was reported to be at Level P5b for speaking and listening and expressed himself using one word (see appendix A2 for P level descriptors). However, the NS stated he was consistently linking two key words in expressive language by the time of data collection. Participant J predominantly used speech to communicate but also

had a Tellus Mobi™, which he accessed directly in order to support communication (see appendix B8). Participant J was also reported to employ some sign, gesture, facial expression and pointing to interact with others.

The NS working with Participant J was a female class teacher on the senior leadership team of the school. She had been working directly with Participant J for a total of four months at the time of data collection. She had sixteen years' SEND experience in a number of different roles and had been a teacher of students with SEND for six years. Participant J was the only experience that the NS had of a child using high-tech AAC.

### *RQ1 Communicative Roles - Linguistic Move-Type*

For the address of RQ1, the first set of results is for the measure of linguistic move-types as shown in table 5.2.3a.

<b>Linguistic Move-Type</b>		<b>AS</b>		<b>NS</b>	
Prep	Ready	-	-	1.00	(0-2)
	Instruct	-	-	23.25	(1-30)
	Explain	-	-	9.25	(0-9)
	Inform	13.00	(1-16)	9.25	(0-12)
	Check	6.75	(0-18)	4.50	(0-6)
	Align	-	-	3.25	(0-6)
	Query-YN	-	-	15.75	(1-15)
	Query-W	-	-	35.00	(5-30)
	Query-Choice	-	-	3.00	(0-5)
	Query-Completion	-	-	7.50	(0-10)
	Request help	0.25	(0-1)	-	-
Initiation	Acknowledge	1.50	(0-5)	23.00	(3-26)
	Object	0.50	(0-2)	1.25	(0-3)
	Reply-Y	7.75	(1-7)	6.25	(0-16)
	Reply-N	1.75	(0-2)	0.25	(0-1)
	Reply-W	23.75	(1-22)	-	-
	Response to instruction	11.75	(1-16)	0.25	(0-1)
	Reply-Choice	0.50	(0-1)	-	-
	Reply-Completion	5.25	(0-8)	-	-
	Clarify	-	-	-	-
	Praise	-	-	9.75	(1-14)
	Comment	2.75	(0-3)	6.00	(0-8)
Summarise	-	-	0.50	(0-1)	
Other	Repetition	25.50	(2-25)	-	-
	Operation of device-Other	16.75	(0-25)	-	-
	NPC	0.75	(0-1)	-	-

Summary	Mean Preparation Moves	-	1.00
	Mean Initiation Moves	20.50	109.50
	Mean Response Moves	57.00	46.00

Table 5.2.3a Summary of mean (range) coded instances of linguistic move-types and other coded categories.

There was a mean of 252 coded instances for the four data collection sessions (AS<NS = 93.00<159.00) showing a difference of 66 between the interlocutors. There was a mean of 234.50 coded linguistic move-types (AS<NS = 75.50<159.00) showing a slightly larger difference of 83.50 between the interlocutors. Initiation move-types show the greatest disparity (AS<NS = 20.00<110.75), a difference of 90.75 mean coded instances between interlocutors.

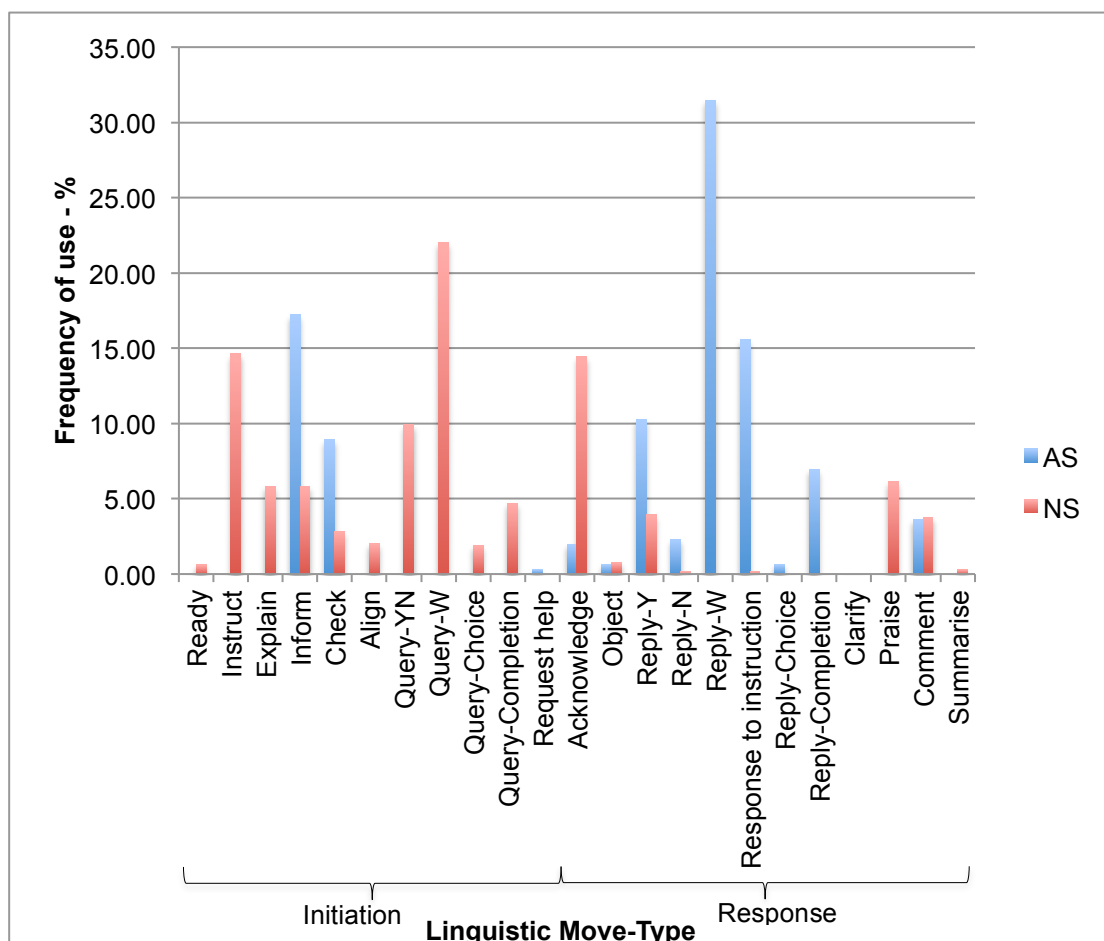


Figure 5.2.3a Distribution of linguistic Move-types (%) across all data collection sessions

Figure 5.2.3a shows the distribution of linguistic move use during narrative construction by the AS and NS. The NS was shown to employ considerably more



initiation move-types than the AS, who predominantly made response moves. The most frequently occurring linguistic move-types employed by the interlocutors (from highest to lowest) were as follows: AS: 'reply-W'=23.75 (31.46%); 'inform'=13.00 (17.22%); 'response to instruction'=11.75 (15.56%); NS: 'query-W'=35.00 (22.01%); 'instruct'=23.25 (14.62%) and 'acknowledge'=23.00 (14.47%). The predominant moves employed by both interlocutors suggest links between NS initiations and AS responses. This will be examined further in the following chapter (Chapter Six – Discussion).

The difference between minimum and maximum coded instances (range) for each linguistic move code shows variation across the four data collection sessions: AS: 'reply-W'=21; 'check'=18; 'inform'=15; 'response to instruction'=15; NS: 'instruct'=29; 'query-W'=25 and 'acknowledge'=23. This highlights the potential variation in narrative construction between NS and AS interlocutors. The linguistic move-types showing greatest variation reflect those most frequently employed by the interlocutors, apart from the AS 'check' moves.

The NS showed much higher use of query-type moves than the AS (AS<NS = 0<61.25). However, 'check' moves, in which a question was asked requesting confirmation, showed higher occurrence for the AS (AS>NS = 6.75>4.50). Excerpt 5.2.3a (PN; Session 1; 'a Birthday') shows Participant J's (AS) use of 'check' (C) questions at lines 50, 54 and 58 through eye gaze and pointing towards the device ('environmental reference'), prior to 'AAC-encoding'.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
49	NS	what else does J have at his birthday?		QW
50	AS	Birthday cake THIS ONE? (point)	looks to NS and points at device screen	RW C
51	NS	'yes' (nods)	gives eye contact	RY
52	AS	' <i>Birthday cake</i> '		
53	NS	mmmm		A
54	AS	THIS ONE? (point)	looks to NS and points at device screen	C
55	NS	'yes' (nods)	gives eye contact	RY
56	AS	' <i>present</i> '		RW
57	NS	mmm J like opening his presents (.) what presents does J get for his birthday?		A QYN QW

58	AS	THIS ONE? (point)	looks to NS and points at device screen	C
59	NS	'yes' (nods)	gives eye contact	RY

Excerpt 5.2.3a Transcription example showing Participant J's use of 'check' questions prior to 'AAC-encoding'

The coded instances of 'repetition' (mean=25.50) and 'operation of device other' (mean=16.75) were attributed solely to the AS. Considerable difference was shown between the most frequently occurring linguistic move-types between interlocutors. The NS made almost two times more linguistic moves than the AS, and over five times more initiation move-types ( $AS < NS = 20.00 < 110.75$ ). Potential initiation-response pairs were observed within the highest occurring move-types, e.g. NS 'instruct' – AS 'response to instruction'. The most frequently employed linguistic moves were reflected in those with the greatest variation as indicated by range.

#### *RQ2 Narrative Condition - Linguistic Move-Type*

The second set of data is presented for the address of RQ2, providing the measure of linguistic moves across narrative conditions, as shown in table 5.2.3b on the following page.

	Linguistic Move-Type	Personal (PN)				Fictional (FN)			
		AS	NS	AS	NS	AS	NS	AS	NS
Prep	Ready	-	-	-	-	-	-	1.00	(0-2)
Initiation	Instruct	-	-	3.50	(1-5)	-	-	19.75	(11-30)
	Explain	-	-	2.50	(0-5)	-	-	6.75	(5-9)
	Inform	3.00	(1-8)	4.25	(0-12)	10.00	(7-16)	5.00	(3-7)
	Check	5.50	(0-18)	3.25	(1-6)	1.25	(0-3)	1.25	(0-3)
	Align	-	-	1.75	(0-6)	-	-	1.50	(0-3)
	Query-YN	-	-	6.75	(3-11)	-	-	9.00	(1-15)
	Query-W	-	-	9.25	(5-13)	-	-	25.75	(17-30)
	Query-Choice	-	-	2.25	(0-5)	-	-	0.75	(0-1)
	Query-Completion	-	-	0.75	(0-2)	-	-	6.75	(1-10)
	Request help	-	-	-	-	0.25	(0-1)	-	-
Response	Acknowledge	-	-	4.5	(3-7)	1.50	(0-5)	18.50	(15-26)
	Object	0.50	(0-2)	-	-	-	-	1.25	(0-3)
	Reply-Y	3.50	(1-6)	5.00	(0-16)	4.25	(2-7)	1.25	(0-3)
	Reply-N	1.25	(0-2)	0.25	(0-1)	0.50	(0-2)	-	-
	Reply-W	6.25	(1-16)	-	-	17.50	(11-22)	-	-
	Response to instruction	2.50	(1-5)	-	-	9.25	(2-16)	-	-
	Reply-Choice	0.25	(0-1)	-	-	0.25	(0-1)	-	-
	Reply-Completion	0.50	(0-2)	-	-	4.75	(1-8)	-	-
	Clarify	-	-	-	-	-	-	-	-
	Praise	-	-	2.00	(1-3)	-	-	7.75	(4-14)
	Comment	0.75	(0-1)	0.75	(0-2)	2.00	(1-3)	5.25	(2-8)
	Summarise	-	-	0.25	(0-1)	-	-	0.25	(0-1)
Other	Repetition	6.00	(2-11)	-	-	19.50	(14-25)	-	-
	NPC	12.00	(0-25)	-	-	4.25	(0-17)	-	-
	Operation of device-Other	0.25	(0-1)	-	-	0.67	(0-1)	-	-
Summary	Total Preparation Moves	-	-	-	-	-	-	1.00	-
	Total Initiation Moves	8.50	-	34.25	-	11.50	-	76.50	-
	Total Response Moves	15.50	-	12.75	-	40.00	-	34.50	-

Table 5.2.3b Summary of mean (range) coded instances of linguistic move-types and other coded categories according to narrative condition

The mean coded instances for both narrative conditions was 252 (PN<FN = 83.25<168.75) showing a difference of 85.50 between the narrative conditions. There was a mean of 234.50 linguistic moves coded (PN<FN = 71.00<163.50) showing a difference of 92.50 between the conditions. In terms of linguistic move-types, similar disparity was shown for mean initiation moves (PN<FN = 42.75<88.00) and mean response moves (PN<FN = 28.25<74.50) across the two conditions.

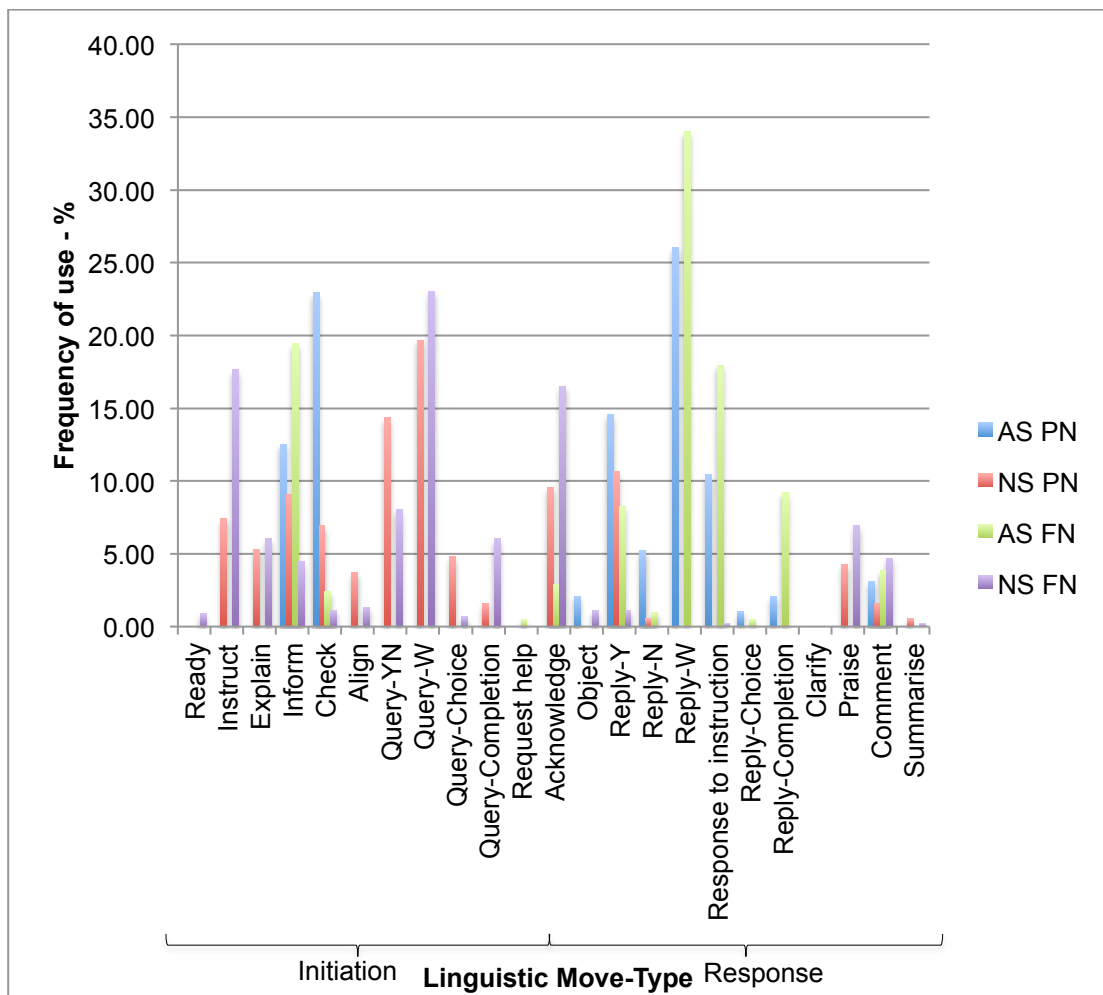


Figure 5.2.3b Distribution of Linguistic move-types according to interlocutor and narrative condition - %

Figure 5.2.3b shows the distribution of linguistic moves between conditions for both interlocutors. Only two notable differences were shown between the interlocutors under the PN condition: 'query-W': AS<NS = 0<9.25 (19.68%); 'reply-W': AS>NS = 6.25 (26.04%)>0. For the FN condition clearer differences were found between the interlocutors for: 'query-W': AS<NS = 0<25.75 (22.99%); 'instruct': AS<NS = 0<19.75 (17.63%); 'acknowledge': AS<NS = 1.50 (2.91%)<18.50 (16.52%); 'reply-W': AS>NS = 17.50 (33.98%)>0.

Under the personal narrative condition, the majority of linguistic move-types were employed with similar frequency between interlocutors. Greater variation between interlocutors was observed during FN.

Coding of linguistic move-types showed variation between conditions for both interlocutors: AS: PN<FN = 24.00<51.50 showing a difference of 27.50

between conditions; NS: PN<FN = 47.00<112.00 showing a larger difference of 65 between conditions. Figure 5.2.3b highlights the biggest differences between the conditions by interlocutors, for AS: 'reply-W': PN<FN = 6.25 (26.04%)<17.50 (33.98%); 'response to instruction': PN<FN = 2.50 (10.42%)<9.25 (17.96%); for NS: 'instruct': PN<FN = 3.50 (7.45%)<19.75 (17.63%); 'query-W': PN<FN = 9.25 (19.68%)<25.75 (22.99%); 'acknowledge': PN<FN = 4.50 (9.57%)<18.50 (16.52%).

The excerpt below (FN; Session 2; 'The Bus Story') evidences the NS' frequent use of 'W-questions' (QW) and instructions ('instruct' (I)) in order to elicit fictional narrative construction from the AS, as identified in Figure 5.2.3b.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
46	NS	Is he happy the bus? (point)	points at book	QYN
47	AS	happy? bus?		Rep
48	NS	I don't know J you tell me what do you think? Look at the pictures (point)	points to device screen	A I QW I
49	NS	which one is the bus? (.) (point)	points to book	QW
50	NS	which one is the buses [face?]		QW
51	AS	[uh crying]	looks to NS	RW
52	NS	'yes' (nods) go on then (point)	gives eye contact and points to device screen	A I
53	AS	'sad'		RI
54	NS	it's a sad bus (.) what about the [train?] (point)	points to book	A QW
55	AS	[sad] (.) bus (.) uuuh	looks surprised towards NS	Rep RW
56	NS		smiles & gives eye contact	A

Excerpt 5.2.3b Transcription example showing NS high frequency use of W-questions (QW) and instructions (I) under the fictional narrative condition

When linguistic move frequency is inspected according to narrative condition (PN or FN) and interlocutor (AS or NS), notable differences are shown between the two narrative conditions. However, this may be as a result of the increased length of Participant J's fictional narratives in contrast to the shorter personal narrative constructions. This will be discussed further in Chapter Six (Discussion). Some similarities were found between the most frequently employed moves and those showing the largest variation (range) across conditions.

### RQ2 Narrative Condition - Linguistic Complexity

The third set of data presents the measures used to investigate linguistic complexity of AS narrative contributions as shown in table 5.2.3c.

	Personal		Fictional	
<b>Mean Content Words</b>	33.00	(13-56)	71.25	(37-112)
<b>Mean Function Words</b>	1.00	(0-2)	2.50	(0-6)
<b>Mean Total Words (tokens)</b>	34.00	(13-56)	73.75	(37-115)
<b>Mean Different Words (types)</b>	16.75	(10-28)	24.50	(20-31)
<b>Type Token Ratio (TTR)</b>	0.49		0.33	

Table 5.2.3c Summary of mean (range) measures of linguistic complexity across four data collection sessions

There was a mean of 107.75 recorded words across the four data collection sessions (PN<FN = 34.00<73.75) showing a difference of 39.75 between the two narrative conditions. A mean of 41.25 different words were recorded across the four sessions (PN<FN = 16.75<24.50) showing a small difference of 7.75 between conditions. A clear disparity is evident between the mean content and function words under both conditions: PN: content words>function words = 33.00>1.00; FN: content words>function words = 71.25>2.50.

The excerpt below (FN; Session 3; 'Peter and the Cat') serves to highlight the AS's predominant use of content words under the fictional narrative condition. Participant J constructs a phrase providing enough narrative information to be understood, but employs no function words. Some AAC-output was produced during page navigation, for example 'people and animals', 'what doing' and 'objects' line 149. Once constructed, the AS produces the whole phrase in line 153.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
144	NS	that one (point)	whispered, points to device screen	I
145	AS	'objects'		RI
146	NS	PRESS THIS (point)	points to device screen	I
147	AS	'ladder'		RI
148	NS	good boy		Pr

149	AS	'stuck' 'people and animals' (.) 'cat' (.) 'what doing' (.) 'stuck' (.) 'objects' (.) 'ladder'		In
150	NS	good [boy]		Pr
151	AS	['tree']		In
152	NS	[what does]		
153	AS	['cat stuck] ladder tree'		In
154	NS	good boy he goes down the ladder doesn't he J	turns page	Pr,A

Excerpt 5.2.3c Transcription example highlighting AS sole use of content words to provide narrative information

The differences between minimum and maximum occurrences (range) of tokens and content words reveal considerable variation across the four data collection sessions: tokens: PN=43; FN=78; content words: PN=43; FN=75.

Total word samples reached the recommended one hundred word minimum sample size for TTR calculation (PN=136 FN=295) (Fletcher, 1985). A lower TTR was found for fictional narrative construction (TTR=0.33) than across personal narratives (TTR=0.49). This may be as a result of the lower total words sample in the personal narrative condition and, therefore, only cautious comparisons can be drawn.

### Summary

The NS took approximately five times more initiation-type moves than the AS. However, both interlocutors made a similar mean number of response moves, showing a difference of only 11 (NS>AS). The NS was the only participant to use preparation-type moves across all interactions, in order to gain the AS' attention and initiate the start of narrative construction. Only three of the ten coded initiation move-types were employed the AS. However, a higher mean of coded instances was recorded for AS use of the initiation moves 'inform' and 'check'. The NS was shown to use nine of the ten initiation move-types, with query-type moves showing the highest mean coded instances. Both interlocutors employed a similar range of response moves (AS>NS = 9>8).

Some differences were observed between narrative conditions, with both interlocutors employing a higher mean total moves during fictional narratives. This increase was predominantly shown in some query-type moves for the NS and related response moves for the AS (shown in Excerpt 5.2.3b). The AS also used

over two times more words during fictional narrative construction. However, these phenomena are likely due to the increased length of fictional narrative construction. Despite this, similar disparity was shown between the use of content words and function words under both conditions; with all evidence showing a notably higher mean use of content words.

*RQ1 Communicative Roles - Communicative Modality*

The first set of results for the measure of communicative modalities is shown below in table 5.2.3d.

	<b>Codes</b>	<b>AS</b>		<b>%</b>	<b>NS</b>		<b>%</b>
Communicative Modality	Speech	5.50	(0-6)	6.41	27.75	(7-23)	25.81
	Vocal Gesture	1.50	(0-3)	1.75	0.50	(0-1)	0.47
	Co-Action	2.25	(0-6)	2.62	2.25	(0-6)	2.09
	AAC-Encoding	8.50	(0-13)	9.91	1.25	(0-3)	1.16
	AAC-Output	6.00	(0-6)	7.00	0.50	(0-1)	0.47
	Eye Gaze - Person	2.25	(0-5)	2.62	6.75	(1-6)	6.28
	Eye Gaze - Device	41.00	(11-39)	47.81	35.75	(8-33)	33.26
	Eye Gaze - Other	12.75	(0-16)	14.87	14.50	(0-20)	13.49
	Facial & BodyGesture	1.75	(0-3)	2.04	2.50	(0-4)	2.33
	Sign	-	-	-	1.25	(0-3)	1.16
	Env. Reference	4.25	(0-6)	4.96	14.50	(0-16)	13.49
Other	Neutral	-	-	-	-	-	-
	NPC	0.25	(0-1)	-	-	-	-

Table 5.2.3d Summary of mean (range) coded instances of each communicative modality and other coded categories.

There was a mean of 193.50 coded instances for the four data collection sessions (AS<NS = 86.00<107.50) showing a difference of 21.50 between the interlocutors. There was a mean of 193.25 codings of communicative modalities (AS<NS = 85.75<107.50) showing a difference of 21.75 between the interlocutors. Multiple communicative modalities were deployed by both interlocutors: AS<NS =10<11 with a difference of only 1. The NS made use of all coded communicative modalities.

The most frequently occurring communicative modalities employed by the interlocutors (from highest to lowest) were as follows: AS: ‘eye gaze-device’ =41.00 (47.81%); ‘eye gaze-other’=12.75 (14.87%); ‘AAC-encoding’=8.50



(9.91%); NS: 'eye gaze-device'=35.75 (33.26%); 'speech'=27.75 (25.81%); 'environmental reference'=14.50 (13.49%); 'eye gaze-other'=14.50 (13.49%).

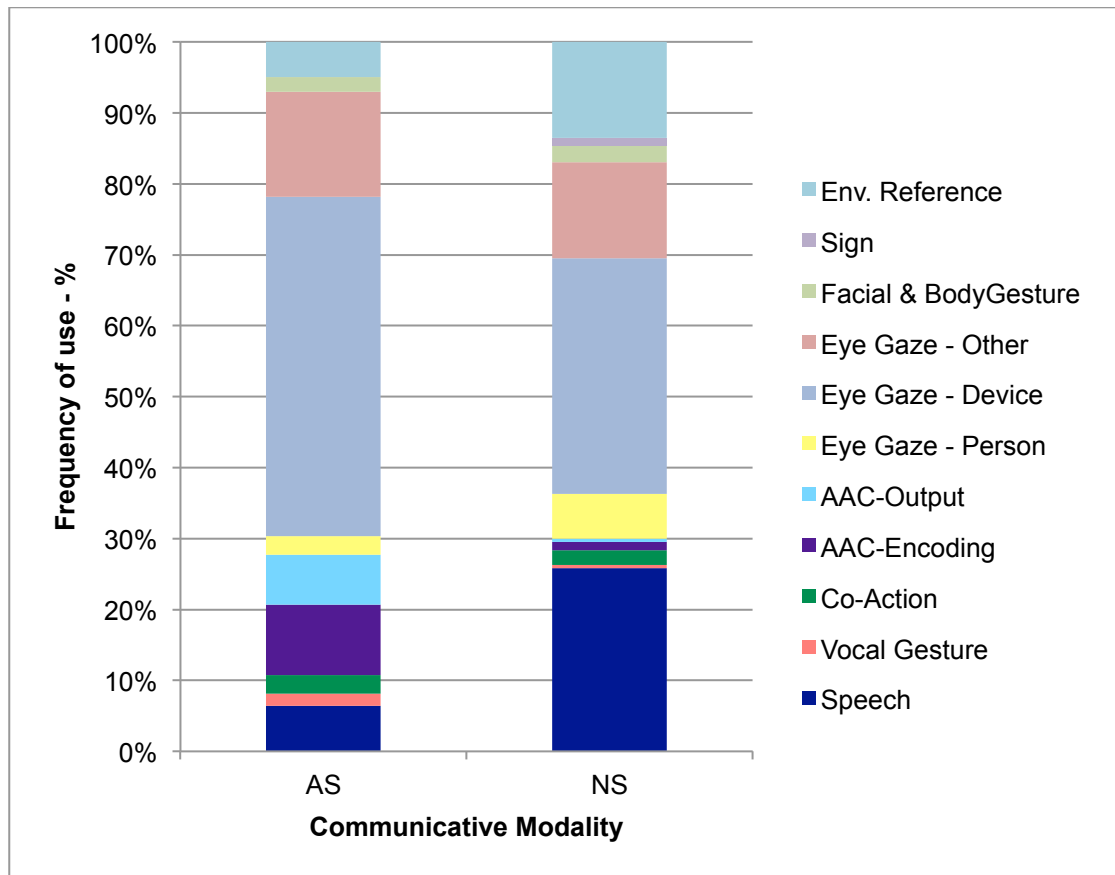


Figure 5.2.3c Distribution of communicative modalities according to interlocutor - %

Figure 5.2.3c presents the distribution of communicative modalities (%) between interlocutors across the four sessions. Almost half the coded instances of 'communicative modalities' for Participant J were 'eye gaze-device' (47.81%). In contrast, the coded instances for the NS were predominantly spread over four modalities: 'eye gaze-device'=33.26%; 'speech'=25.81%; 'eye gaze-other'=13.49% and 'environmental reference'=13.49%.

Excerpt 5.2.3d, shown on the next page (PN; Session 4; 'First day at school'), highlights the use of multiple communicative modalities by both interlocutors in order to construct the narrative. Both the AS and NS employ, eye gaze, gesture and speech during the moves shown. In addition, the NS employs 'environmental reference' (pointing) and signing, the AS uses 'AAC-output' to provide some responses to NS questions.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
4	AS	'this one?' (point) (*vocalisation)	points to device screen and looks at NS	RW
5	NS	'yes' (nods) you have a look J and you see what you want to tell me	makes eye contact with AS	A I
6	AS	OH NO it's (*unintelligible speech) (..) uh oh	gestures shock by putting hand to mouth	Co
7	NS	what does J play at [school?] (point)	points to device screen	QW
8	AS	<i>['play']</i>		RW
9	NS	What work does he do? (point) (.)	points to device screen	QW
10	NS	what does J drink at school? (point) what [does he learn?] (point)	points to device screen points to device screen	QW QW
11	AS	<i>['chat']</i>		RW
12	NS	what does J like reading? (point)	points to device screen	QW
13	AS	<i>'chat'</i>		OD
14	NS	who do you chat with J?		QW
15	AS	<i>['chat']</i> [*(vocalisation)] (.) 'see'		OD OD
16	NS	do you chat with your FRIEND/s?	uses Makaton sign for 'friend'	QYN

Excerpt 5.2.3d Transcription example showing the multiple communicative modalities employed by both interlocutors during narrative construction

The difference between minimum and maximum occurrences (range) for each communicative modality reveals some variation across the four data collection sessions: AS: 'eye gaze-device'=28; 'eye gaze-other'=16; 'AAC-encoding'=13; NS: 'eye gaze-device'=25; 'eye gaze-other'=20; 'speech'=16 and 'environmental reference'=16.

The most frequently coded communicative modalities showed similarities between interlocutors. Both participants employed a high frequency of all eye gaze-type acts during narrative construction. The most frequently coded modalities were those with the greatest variation as indicated by range.

Despite Participant J being a verbal participant, the data shows a higher use of 'AAC-encoding' than 'speech' ('AAC-encoding' 8.50>5.50 'speech'). Coded instances of 'AAC-encoding' and 'AAC-output' revealed similarities between the two modalities for the AS: 'AAC-encoding'>'AAC-output' = 8.50>6.00; showing

only a small difference of 2.50. The NS had some minimal input to 'AAC-encoding'=1.25 and 'AAC-output'=0.50.

*RQ2 Narrative Condition – Communicative Modality*

The following set of data, relating to RQ2, is for the measure of communicative modality as shown in table 5.2.3e.

Codes	Personal						Fictional					
	AS		%	NS	%		AS		%	NS	%	
Speech	0.75	(0-2)	2.52	9.00	(7-11)	25.90	4.75	(3-6)	8.48	18.75	(16-23)	25.77
Vocal Gesture	0.50	(0-1)	1.68	-	-	-	1.00	(0-3)	1.79	0.50	(0-1)	0.69
Co-Action	0.25	(0-1)	0.84	0.25	(0-1)	0.72	2.00	(0-6)	3.57	2.00	(0-6)	2.75
AAC-Encoding	2.75	(0-5)	9.24	0.50	(0-2)	1.44	5.75	(0-13)	10.27	0.75	(0-3)	1.03
AAC-Output	3.00	(0-6)	10.08	-	-	-	3.00	(2-6)	5.36	0.50	(0-1)	0.69
Eye Gaze - Person	1.50	(0-5)	5.04	4.25	(3-6)	12.23	0.75	(0-1)	1.34	2.50	(1-5)	3.44
Eye Gaze - Device	18.25	(11-26)	61.34	15.50	(8-24)	44.60	22.75	(14-39)	40.63	20.25	(14-33)	27.84
Eye Gaze - Other	0.50	(0-2)	1.68	0.50	(0-2)	1.44	12.25	(8-16)	21.88	14.00	(11-20)	19.24
Facial & BodyGesture	0.50	(0-2)	1.68	1.75	(0-4)	5.04	1.25	(0-3)	2.23	0.75	(0-2)	1.03
Sign	-	-	-	1.00	(0-3)	2.88	-	-	-	0.25	(0-1)	0.34
Env. Reference	1.75	(1-4)	5.88	2.00	(0-3)	5.76	2.50	(0-6)	4.46	12.50	(9-16)	17.18
Other Neutral	-	-	-	-	-	-	-	-	-	-	-	-
Other NPC	0.25	(0-1)	-	-	-	-	-	-	-	-	-	-

Table 5.2.3e Summary of mean (range) coded instances of communicative modalities and other coded categories according to narrative condition

The mean coded instances for the two narrative conditions was 193.50 (PN<FN = 64.75<128.75) showing a difference of 64 between the conditions. There was a mean of 193.25 codings of the communicative modalities (PN<FN = 64.50<128.75) showing a very similar difference of 64.25 between the conditions.

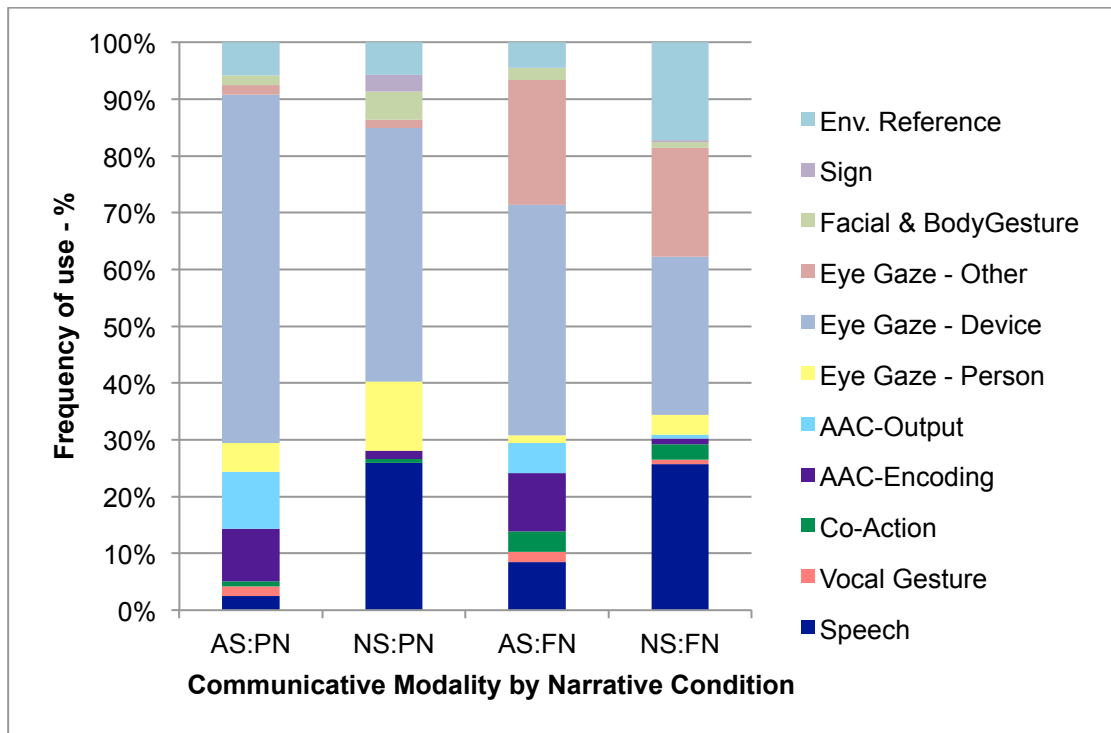


Figure 5.2.3d Distribution of communicative modalities according to interlocutor and narrative condition - %

Figure 5.2.3d shows the distribution of linguistic moves employed by both interlocutors between narrative conditions. Few notable differences were shown between the interlocutors by condition. During PN 'speech' was the only modality to show any clear difference between AS and NS use ( $AS < NS = 0.75$  (2.52%) < 9.00 (25.90%)). Under the FN condition larger differences were observed for: 'speech':  $AS < NS = 4.75$  (8.48%) < 18.75 (25.77%) and 'environmental reference':  $AS < NS = 2.50$  (4.46%) < 12.50 (17.18%).

When the data are separated by narrative condition, the majority of communicative modalities are employed with similar frequency with the few notable exceptions mentioned above.

Codings of communicative modalities varied according to condition, for both interlocutors; AS:  $PN < FN = 29.75 < 56.00$ , showing a difference of 26.25; NS:  $PN < FN = 34.75 < 72.75$ , showing a difference of 38.00. Despite the difference shown in mean communicative modalities according to condition, only one modality showed a notable difference for the AS ('eye gaze-other'  $PN < FN = 0.50$  (1.68%) < 12.25 (21.88%)). The biggest differences between the conditions for NS were: 'eye gaze-other':  $PN < FN = 0.50$  (1.44%) < 14.00 (19.24%); 'environmental

reference': PN<FN = 2.00 (5.76%)<12.50 (17.18%); 'speech': PN<FN = 9.00 (25.90%)<18.75 (25.77%). These differences, as shown in figure 5.2.3d, may be attributed to the presence of the storybook during fictional narrative construction.

Few notable differences were observed when the individual communicative modality frequency was inspected according to narrative condition (PN or FN) and interlocutor (AS or NS). However, the disparity in mean codings of the communicative modalities between conditions shows some difference for both NS and AS contributions.

### *Summary*

The NS produced higher mean coded communicative acts than the AS (n=21.75, AS<NS). Both interlocutors employed multiple modalities, using almost all coded acts at some point during narrative construction. Some similarities were observed between NS and AS communicative modality use. For example, both interlocutors produced the highest mean coded acts for 'eye gaze-device' and 'eye gaze-other'. Despite being a verbal participant, Participant J employed higher mean coded instances of 'AAC-encoding' than 'speech'.

Higher mean coded communicative acts was recorded for personal narrative (PN<FN = 64.50<128.75). However, individual communicative modalities showed similar frequency of use across the conditions. 'Eye gaze-other' showed the largest difference between conditions for both interlocutors. This is likely to be due to the presence of the storybook stimulus under the fictional narrative condition. This will be discussed further in Chapter Six (Discussion).

### *RQ3 Integrated Profile of Narrative Construction*

Review of transcripts revealed patterns of co-occurrence between communicative modality use and linguistic move-type for both interlocutors. The NS employed speech concurrently with almost all linguistic move-types recorded. This can be attributed to the position of speech at the top of the communicative modality hierarchy for natural speakers. However, other co-occurrences of communicative modality and linguistic move-type were also recorded.

- *Use of gesture*

Both interlocutors employed ‘environmental reference’ during fictional and personal narrative construction in conjunction with different linguistic move-types. The NS employed two different types of ‘environmental reference’; pointing towards the AAC device during both narrative conditions, and pointing towards the storybook within FN construction. NS pointing towards the storybook was observed in conjunction with query-type moves, such as ‘W-questions’ (QW) and ‘yes/no-questions’ (QYN). In contrast, pointing towards the AAC device predominantly co-occurred as part of an instruction (‘instruct’ (I)). Excerpt 5.2.3e (FN; Session 1; ‘The Squirrel Story’) evidences the NS’ use of pointing towards the storybook to provide context for questions and towards the AAC device as part of instruction moves. Both of these uses for environmental reference were employed by the NS to facilitate the AS’ construction of narrative by providing non-verbal cues to responses.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
60	NS	which other animals have we got j? (point)	Points at book	QW
61	AS	Animals baby squirrel	turns page	Rep RW
62	NS	PRESS THIS (point)	Points at device screen	I
63	AS	‘animals’	Turns page back	RI
64	NS	(point) which animals are on this page?	Points at book	QW
65	AS	animals		Rep
66	NS	which other ones J can you tell me?		QW
67	AS	animals (.) ‘squirrel story animals’ (.) the animals		Rep RW
68	NS	who’s this? (point)	Points at character in book	QW
69	AS	this rabbit		RW
70	NS	*yes PRESS THIS} (point)	Points to device screen	A I
71	AS	‘rabbit’		RI
72	NS	and what about this one (point)	Points at character in book	QW
73	AS	rat		RW

Excerpt 5.2.3e NS use of pointing towards the AAC device and fictional narrative stimulus

- *Use of eye gaze*

The AS employed pointing toward the device when asking questions requesting confirmation ('check' (C)). Eye-gaze towards the NS was also coded in conjunction with this linguistic move-type in order to gain reassurance before completing 'AAC-encoding'. The NS looked towards the AS ('eye gaze-person') while providing a positive response to these confirmation requests. Excerpt 5.2.3f (PN; Session 1; 'a Birthday') provides an example of this discourse pattern. The AS is shown asking confirmation from the NS before completing 'AAC-encoding' ('check' (C)). The NS responds, using 'speech' and 'eye gaze-person' to give a positive response ('reply-Y'), encouraging the AS to complete 'AAC-encoding' and 'AAC-output'.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
11	NS	[WHO/who is there?]	uses Makaton sign for 'who'	QW
12	AS	friend's name (point)	looks to NS and points at device screen	RW C
13	NS	'yes' (nods)	gives eye contact	RY
14	AS	'friend's name, friend's name' (.) go	looks at screen and frowns	RW
15	AS	THIS ONE? (point)	looks to NS and points at device screen	C
16	NS	'yes' (nods)	gives eye contact	RY
17	AS	'friend's name' (.) oops		RW,Co
18	AS	THIS ONE? (point)	looks to NS and points at device screen	C
19	NS	'yes' (nods)	gives eye contact	RY
20	AS	'friend's name'		RW
21	AS	THIS ONE? (point)	looks to NS and points at device screen	C
22	NS	'yes' (nods)	gives eye contact	RY

Excerpt 5.2.3f Transcription example showing AS use of 'environmental reference' and 'eye gaze-person' in conjunction with linguistic move-types

- *Use of signing*

Both interlocutors also employed Makaton signing. The NS predominantly initiated the use of sign, which was then used by the AS in response. For the NS, signing was coded in conjunction with query-type moves, providing emphasis to

the keywords within a question. The AS employed sign as part of response moves. This was commonly to confirm the end of a narrative construction using the Makaton sign for 'finish'. Excerpt 5.2.3g (PN; Session 3; 'Pets') shows sign being used in conjunction with four of the five query-type moves coded for the NS. The AS employs sign once, mirroring the NS' use of the sign for 'finish' to confirm the end of his narrative.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
65	NS	who <u>WALK</u> /s your dog J?	uses Makaton sign for 'walk'	QW
66	AS	'rabbit'		OD
67	NS	is it Daddy or is [it Mummy?]		QCH
68	AS	['rabbit'] (.) 'rabbit'	sits back away from device	OD
69	NS	have you <u>FINISH</u> /finished J?	uses Makaton sign for 'finish'	QYN
70	AS	<u>FINISH</u> /finished	uses Makaton sign for 'finish'	RY
71	NS	<u>FINISH</u> /finished telling me about your pets	uses Makaton sign for 'finish'	C
72	AS	pets		Rep
73	NS	<u>YES</u> ?	uses Makaton sign for 'yes'	C
74	AS	yes		RY
75	NS	good boy (.) you've worked really hard well done		Pr Pr

Excerpt 5.2.3g NS and AS use of Makaton signing in conjunction with linguistic move-types

Limited differences were observed between narrative conditions in terms of the co-occurrence of communicative modalities and linguistic move-types. Pointing towards the page of the storybook could not have been employed under the personal condition. The NS also used the storybook in order to gain the AS' attention and open some narrative construction, physically placing it in front of him in conjunction with a 'ready' (R) move. Under the personal condition no 'ready' moves were recorded.

### Summary

Patterns of co-occurring communicative modality and linguistic move-type use were identified under the two narrative conditions. Speech was the NS' dominant communicative modality, being employed to produce all linguistic move-types. The NS employed a range of hand gestures in conjunction with query-type



moves and instructions. Environmental reference towards the device was employed when the NS provided an instruction. When directed at the fictional stimulus, NS pointing co-occurred with query-type moves, e.g. 'W-questions' (QW).

The AS was coded asking 'check' questions in conjunction with 'environmental reference' towards the AAC device and eye gaze towards the NS. The NS reciprocated this eye gaze alongside speech to produce yes-responses (reply-Y).

The narrative condition had limited impact on the co-occurrence of communicative modalities and linguistic move-types. The only identified difference was NS pointing towards the storybook and placement of the book in front of the AS to engage his attention prior to beginning narrative construction. Other communicative modalities were used with similar frequency and in conjunction with the same linguistic move-types across both conditions.

#### **5.2.4 Participant 'O'**

Participant O was a 9;06 year old boy with a non-specified chromosomal abnormality that presented similarly to an ASC. He was ambulant but had mild dyspraxia affecting some fine motor movements including speech. Participant O had normal vision with corrective lenses. He had a good understanding of simple sentences with a maximum of two key words. Expressively, Participant O would predominantly produce single word utterances but would occasionally link two words together. To support his verbal communication he had a Samsung NP-Q1 Ultra tablet™ with Q-talk™ software which he accessed using either direct access or a stylus. He also employed a combination of speech, vocalisation, sign, gesture and facial expression in order to communicate.

The NS supporting Participant O during the study was a female class teacher. She had worked with Participant O for a continuous period of two years. The NS had been working in SEND settings for 20 years. She had no previous experience of high-tech AAC prior to the two years' working with Participant O.

*RQ1 Communicative Roles – Linguistic Move-Type*

The first set of results is for the measure of linguistic moves as shown in table 5.2.4a.

<b>Linguistic Move-Type</b>		<b>AS</b>		<b>NS</b>	
Prep	Ready	-	-	2.75	(0-3)
	Instruct	0.50	(0-1)	7.00	(1-13)
Initiation	Explain	-	-	6.25	(2-5)
	Inform	15.50	(4-14)	2.25	(0-4)
	Check	-	-	12.75	(1-17)
	Align	-	-	1.50	(0-5)
	Query-YN	-	-	21.25	(2-27)
	Query-W	1.00	(0-4)	25.00	(8-22)
	Query-Choice	-	-	1.50	(0-3)
	Query-Completion	-	-	3.00	(0-4)
	Request help	-	-	-	-
	Response	Acknowledge	2.50	(0-4)	44.00
Object		-	-	2.00	(0-3)
Reply-Y		23.5	(2-29)	-	-
Reply-N		4.50	(0-7)	-	-
Reply-W		20.00	(4-20)	1.00	(0-4)
Response to instruction		4.00	(0-8)	-	-
Reply-Choice		1.25	(0-3)	-	-
Reply-Completion		3.00	(0-5)	-	-
Clarify		-	-	-	-
Praise		-	-	7.75	(0-8)
Comment		1.50	(0-3)	13.75	(2-12)
Summarise		-	-	1.50	(0-4)
Other		Repetition	0.25	(0-1)	-
	NPC	5.50	(0-10)	-	-
	Operation of device-Other	1.25	(0-3)	-	-
Summary	Mean Preparation Moves	-	-	2.75	-
	Mean Initiation Moves	17.00	-	81.00	-
	Mean Response Moves	66.00	-	70.00	-

Table 5.2.4a Summary of mean (range) coded instances of linguistic move-types and other coded categories.

There was a mean of 243.50 coded instances for the four data collection sessions (AS<NS = 89.75<153.75) showing a difference of 64 between the interlocutors. There was a mean of 236.75 linguistic moves coded during all sessions (AS<NS = 83.00<153.75) showing a difference of 70.75 between the

interlocutors. Initiation move-types show the greatest disparity (AS<NS = 17.00<81.00) revealing a difference of 64 between interlocutors.

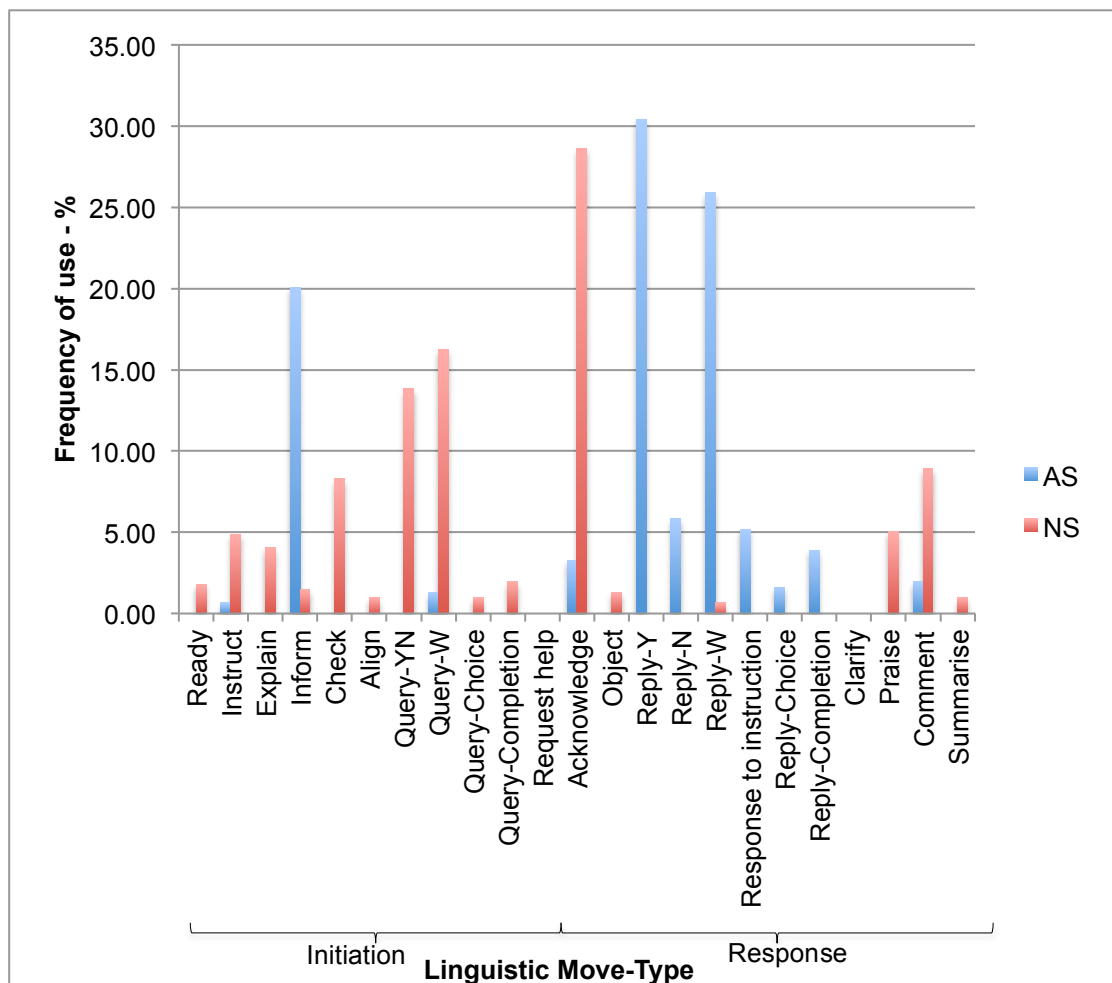


Figure 5.2.4a Distribution of Linguistic Move-types (%) across all data collection sessions

Figure 5.2.4a provides the distribution of linguistic moves employed by both interlocutors during all recorded narrative constructions. The NS was shown to make four times more initiation type moves than the AS. A range of ten initiation move-types was employed by the NS in contrast to only 3 used by the AS. The most frequently occurring linguistic move-types employed by the interlocutors (from highest to lowest) were as follows: AS: ‘reply-Y’=23.50 (30.42%); ‘reply-W’=20.00 (25.89%); ‘inform’=15.50 (20.06%); NS: ‘acknowledge’=44.00 (28.62%); ‘query-W’=25.00 (16.26%); ‘query-Y/N’=21.25 (13.82%). The most frequently employed initiation moves made by the NS were matched by the response moves of the AS. This indicates some relationship between NS and AS moves.

The NS employed a considerably higher number of query-type moves than the AS (AS<NS = 1.00<50.75) showing a notable difference of 49.75 between interlocutors. 'Acknowledgement' also shows a clear disparity in use between interlocutors (AS<NS = 2.50 (3.24%)<44.00 (28.62%)). The excerpt below (PN; Session 2; 'a Christmas') evidences the NS' frequent use of questions followed by feedback after an AS response. This may be part of the recognised educational discourse structure – 'Initiation, response, feedback' suggested by Sinclair and Coulthard (1975). The role of the IRF pattern in AS:NS narrative interaction is discussed further in Chapter Six.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
66	NS	[what games do you play?]		QW
67	AS	[ball (.) ball]		RW
68	NS	you play with a ball		A
69	AS	yeh		RY
70	NS	did you get a ball for christmas?		QYN
71	AS	yeh		RY
72	NS	a new ball		C
73	AS	yeh		RY
74	NS	did you		A
75	AS	'give'		In
76	NS	and did <u>YOU</u> give a present to somebody?	points to AS	QYN
77	AS	yeh		RY
78	NS	who did <u>YOU</u> give your present to?	points to AS	QW
79	NS	can i guess?		QYN
80	AS	BROTHER (*vocalisation)	uses Makaton sign for 'brother'	RW
81	NS	your <u>BROTHER</u>	uses Makaton sign for 'brother'	A
82	AS	yeh		RY

Excerpt 5.2.4a Transcription example showing 'query' and 'acknowledge' moves employed by the NS

The difference between minimum ranges for each linguistic move show notable variation across the four data collection sessions: AS: 'reply-Y'=27; 'reply-W'=16; NS: 'query-Y/N'=25; 'acknowledge'=20; 'check'=16 and 'query-W'=14. The most frequently occurring linguistic moves are reflected in those showing greatest variation across the four sessions. The mean coded instances of 'repetition' (mean=0.25) and 'operation of device other' (mean=5.50) were attributed solely to the AS.

Clear disparity was shown between the most frequently occurring linguistic move-types between interlocutors. Potential initiation-response pairs were observed within the highest occurring move-types, e.g. NS ‘query-W’ – AS ‘reply-W’. The high frequency of acknowledgements made by the NS may suggest a role in the provision of feedback as part of an IRF discourse pattern. This will be discussed in Chapter Six (Discussion).

### *RQ2 Narrative Condition – Linguistic Move-Type*

The second set of results is for the measure of linguistic moves across the two narrative conditions, as shown in table 5.2.4b.

Linguistic Move-Type		Personal (PN)				Fictional (FN)			
		AS		NS		AS		NS	
Prep	Ready	-	-	0.50	(0-1)	-	-	2.25	(1-3)
	Instruct	0.25	(0-1)	2.50	(1-4)	0.25	(0-1)	5.00	(2-13)
	Explain	-	-	2.75	(2-5)	-	-	3.50	(3-5)
	Inform	6.50	(4-12)	0.50	(0-1)	9.00	(4-14)	1.75	(0-4)
	Check	-	-	8.75	(3-17)	-	-	4.00	(1-9)
	Align	-	-	0.25	(0-1)	-	-	1.25	(0-5)
	Query-YN	-	-	16.00	(7-27)	-	-	5.25	(2-10)
	Query-W	1.00	(0-4)	13.00	(8-20)	-	-	12.00	(8-22)
	Query-Choice	-	-	1.25	(0-3)	-	-	0.25	(0-1)
	Query-Completion	-	-	-	-	-	-	3.00	(0-4)
Request help	-	-	-	-	-	-	-	-	
Initiation	Acknowledge	0.25	(0-1)	22.50	(15-34)	2.25	(0-4)	21.50	(14-28)
	Object	-	-	0.75	(0-2)	-	-	1.25	(0-3)
	Reply-Y	18.75	(8-29)	-	-	4.75	(2-10)	-	-
	Reply-N	4.00	(2-7)	-	-	0.50	(0-1)	-	-
	Reply-W	10.75	(4-20)	1.00	(0-4)	9.25	(5-16)	-	-
	Response to instruction	1.00	(0-2)	-	-	3.00	(0-8)	-	-
	Reply-Choice	1.00	(0-3)	-	-	0.25	(0-1)	-	-
	Reply-Completion	-	-	-	-	3.00	(0-5)	-	-
	Clarify	-	-	-	-	-	-	-	-
	Praise	-	-	1.25	(0-2)	-	-	6.50	(5-8)
	Comment	0.75	(0-1)	6.00	(2-8)	0.75	(0-3)	7.75	(4-12)
	Summarise	-	-	0.25	(0-1)	-	-	1.25	(0-4)
Response	Repetition	-	-	-	-	0.25	(0-1)	-	-
	Operation of device-Other	2.50	(1-5)	-	-	3.00	(0-10)	-	-
	NPC	1.00	(0-3)	-	-	0.25	(0-1)	-	-

Summary	Mean Preparation Moves	-	0.50	-	2.25
	Mean Initiation Moves	7.75	45.00	9.25	36.00
	Mean Response Moves	39.00	31.75	27.00	38.25

Table 5.2.4b Summary of mean (range) coded instances of linguistic move-types and other coded categories according to narrative condition

The total mean coded instances was 243.50 (PN>FN = 127.50>116.00) showing a difference of 11.50 between the narrative conditions. There was a mean of 236.75 linguistic moves coded (PN>FN = 124.00>112.75) showing a similar difference of 11.25 between the conditions. In terms of linguistic move-types, similar small differences were shown for mean initiation moves (PN>FN = 52.75>45.25) and mean response moves (PN>FN = 70.75>65.25) across the two conditions.

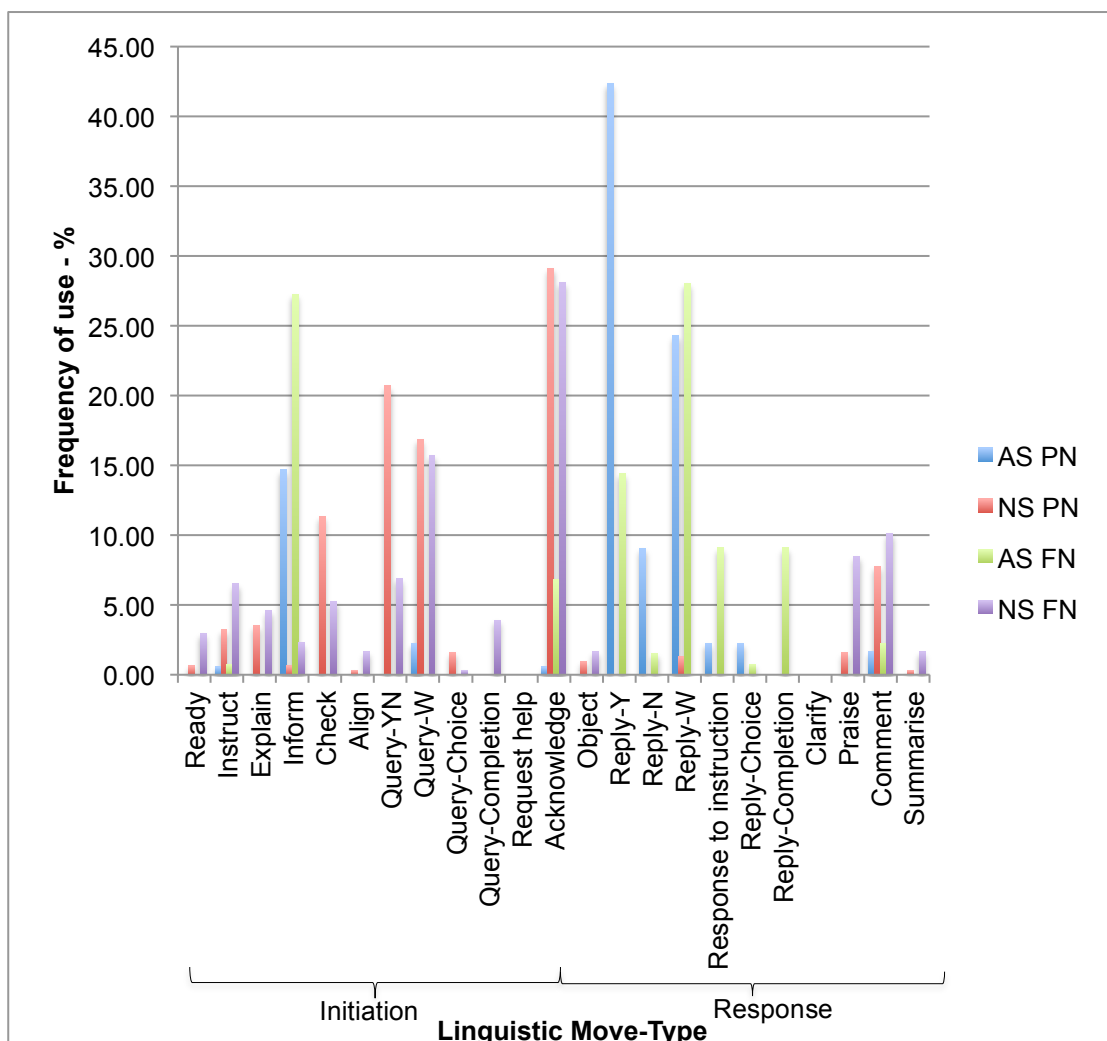


Figure 5.2.4b Distribution of Linguistic move-types according to interlocutor and narrative condition - %

Figure 5.2.4b shows the distribution of linguistic move-types between the two narrative conditions. The biggest differences between the interlocutors by condition were for PN: 'acknowledge': AS<NS = 0.25 (0.56%)<22.50 (29.13%); 'reply-Y': AS>NS = 18.75 (42.37%)>0; 'query-Y/N': AS<NS = 0<16.00 (20.71%). Only two notable differences were shown between the interlocutors under the FN condition: 'acknowledge': AS<NS = 2.25 (6.82%)<21.50 (28.10%); 'query-W': AS<NS = 0<12.00 (15.69%).

When the data are separated by narrative condition, the majority of linguistic moves are employed with similar frequency, showing only small differences between interlocutors. The notable exceptions to this are mentioned above.

Coding of mean linguistic moves made showed variation between conditions for both interlocutors: AS: PN>FN = 46.75>36.25 showing a difference of 10.50 linguistic moves between conditions. For the NS: PN>FN = 77.25>76.50 showing a small difference of 0.75 between conditions. Only one notable difference was recorded between the conditions for each interlocutor. For AS: 'reply-Y': PN>FN = 18.75 (42.37%)>4.75 (14.39%) showing a difference of 14 between conditions; for NS: 'query-Y/N': PN>FN = 16.00 (20.71%)>5.25 (6.86%) revealing a difference of 10.75 between conditions. The similarity of linguistic move use, by both participants, across narrative conditions, can be seen in figure 5.2.4b.

When linguistic move use is inspected according to narrative condition (PN or FN) and interlocutor (AS or NS), very few differences are shown between the two narrative conditions. Some links could be made between NS and AS moves showing greatest disparity between conditions.

### *RQ2 Narrative Condition - Linguistic Complexity*

The following set of mean scores provides evidence for RQ2. Data for the measures of linguistic complexity are shown in table 5.2.4c.

	Personal		Fictional	
<b>Mean Content Words</b>	42.50	(22-88)	31.00	(15-61)
<b>Mean Function Words</b>	3.50	(0-10)	1.50	(0-3)
<b>Mean Total Words (tokens)</b>	46.00	(22-98)	32.50	(15-62)
<b>Mean Different Words (types)</b>	21.00	(12-40)	16.00	(11-21)
<b>Type Token Ratio (TTR)</b>	0.46		0.49	

Table 5.2.4c Summary of mean (range) measures of linguistic complexity across four data collection sessions

There was a mean of 78.50 recorded words for the four data collection sessions (PN>FN = 46.00>32.50) showing a difference of 13.50 between the two narrative conditions. A mean of 37 different words were recorded across the four sessions (PN>FN = 21.00>16.00) showing a small difference of 5.00 between conditions. A considerably larger number of content words were recorded than function words under both conditions. PN: content words>function words = 42.50>3.50 showing a difference of 39.00 and FN: content words>function words = 31.00>1.50 revealing a difference of 29.50 between word types.

Excerpt 5.2.4b (FN; Session 3; 'Peter and the Cat') serves to highlight the AS's predominant use of content words under the fictional narrative condition. Participant O produced short content word phrases constructed using 'speech' and 'AAC-output' to provide narrative information. Although no function words are employed, the phrases are intelligible (line 30). The excerpt also shows the modelling of function word use by the NS in response to the AS' content word utterances (lines 31 and 35).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
25	AS	'bag'	starts to turn page	In
26	NS	bag (.) where's his bag? (point)	points to page	A QW
27	AS	THERE (point)	turns page points to page with stylus	RW
28	NS	it's out down <u>ON</u> the floor isn't it		In
29	NS	what's peter doing? (point)	points to page	QW
30	AS	boy 'tree'	looks at NS	In
31	NS	he's <u>CLIMB</u> /ing the <u>TREE</u> isn't he to try and get the cat (point)	uses Makaton signs for 'climb' and 'tree'	A In
32	AS		turns page	
33	NS	ok (..) <u>UH OH</u> what's	puts hand to	A



		happening now?	mouth	Co
				QW
34	AS	'boy cat tree'		In
35	NS	<u>GOOD</u> boy that's great (.) the <u>BOY</u> and the <u>CAT</u> are in the tree	uses Makaton signs for 'good', 'boy' and 'cat'	Pr S

Excerpt 5.2.4b Transcription example showing AS predominant use of content words and NS modelling of function word use.

The difference between minimum and maximum occurrences (range) of tokens, and of content words reveals considerable variation across the four data collection sessions: tokens: PN=76; FN=47; types: PN=28; FN=10; content words: PN=66; FN=46.

A token sample greater than 100 was recorded for both fictional and personal narrative, complying with Fletcher's (1985) suggested minimum sample size. TTR values varied only slightly between narrative condition, with the AS producing a value near the previously established norm of 0.50 (Templin, 1957) under both conditions (see table 5.2.4c).

### Summary

The NS produced mean initiation move use four times higher than the AS. However, both interlocutors produced a similar mean number of response moves, showing a difference of only 6 (NS>AS). The NS was the only participant to use preparation-type moves across all interactions, to gain the AS' attention and initiate narrative construction. Only three of the ten coded initiation move-types were employed by the AS, 'instruct', 'inform' and 'Query-W'. The NS used nine of the ten initiation move-types, including a high frequency of query-type moves. The AS employed a higher number of response type-moves, using eight of the twelve coded move-types, in contrast to the NS who employed six. No notable difference was found in the data across narrative conditions.

The linguistic complexity data showed the AS produced a slightly higher mean number of words during personal narrative construction. Minimal function word use was recorded under both narrative conditions. The AS predominantly employed content words to produce narrative construction, an example of which is shown in excerpt 5.2.4b. A similar TTR was recorded across both types of narrative.

### RQ1 Communicative Roles - Communicative Modality

The following set of results is for the measure of communicative modality as shown in table 5.2.4d.

	<b>Codes</b>	<b>AS</b>		<b>%</b>	<b>NS</b>		<b>%</b>
Communicative Modality	Speech	1.75 (0-2)	2.58	24.00 (7-23)	27.35		
	Vocal Gesture	3.00 (0-3)	4.43	1.25 (0-3)	1.42		
	Co-Action	-	-	-	-		
	AAC-Encoding	4.25 (1-4)	6.27	0.25 (0-1)	0.28		
	AAC-Output	4.25 (0-5)	6.27	-	-		
	Eye Gaze - Person	8.75 (0-17)	12.92	19.75 (2-33)	22.51		
	Eye Gaze - Device	24.25 (4-25)	35.79	13.00 (0-12)	14.81		
	Eye Gaze - Other	14.00 (1-20)	20.66	14.25 (0-18)	16.24		
	Facial & BodyGesture	2.75 (0-3)	4.06	8.00 (0-11)	9.12		
	Sign	-	-	3.25 (0-4)	3.70		
	Env. Reference	4.75 (0-10)	7.01	4.00 (0-7)	4.56		
Other	Neutral	1.00 (0-2)	-	0.25 (0-1)	-		
	NPC	0.25 (0-1)	-	-	-		

Table 5.2.4d Summary of mean (range) coded instances of communicative modalities and other coded categories.

There was a mean of 157 coded instances for the four data collection sessions (AS<NS = 69.00<88.00) showing a difference of 19.00 between the interlocutors. There was a mean of 155.50 communicative modalities coded (AS<NS = 67.75<87.75) showing a difference of 20.00 between the interlocutors. Both interlocutors employed multiple communicative modalities; Participant O and the NS used a total of nine modalities.

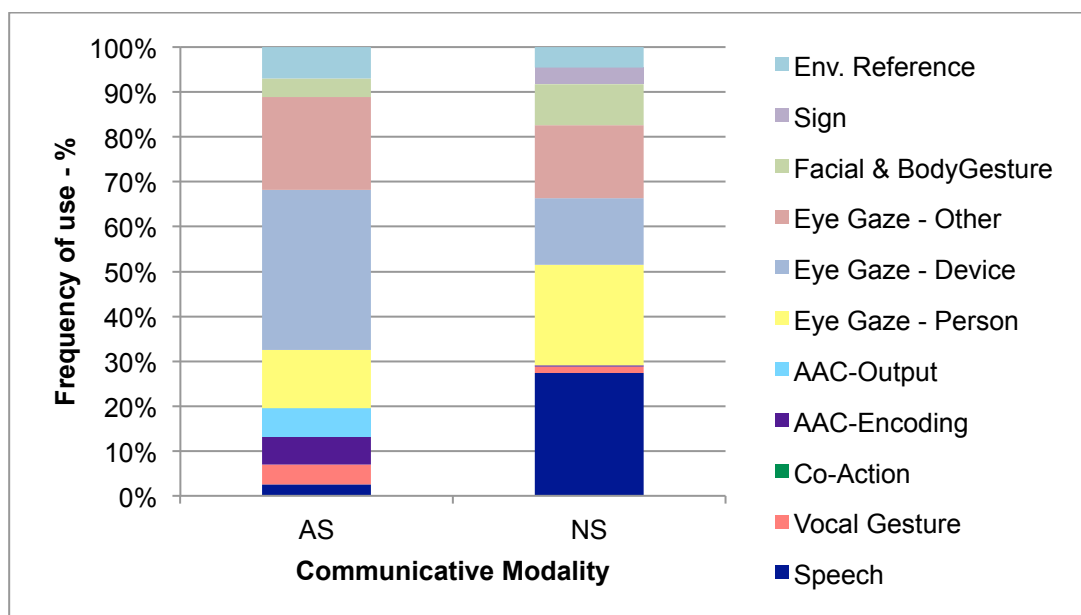


Figure 5.2.4c Distribution of communicative modalities according to interlocutor %

The distribution of communicative modalities (%) between interlocutors over the four sessions is shown in figure 5.2.4c. The coded instances for the AS were predominantly spread over two modalities: 'eye gaze-device'=35.79%; 'eye gaze-other'=20.66%. For the NS, coded instances were spread over four main modalities: 'speech'=27.35%; 'eye gaze-person'=22.51%; 'eye gaze-other'=16.24%; 'eye gaze-device'=14.81%.

Figure 5.2.4c also illustrates the most frequently occurring communicative modalities employed by the interlocutors. These were as follows (from highest to lowest): AS: 'eye gaze-device' =24.25 (35.79%); 'eye gaze-other'=14.00 (20.66%); 'eye gaze-person'=8.75 (12.92%); NS: 'speech'=24.00 (27.35%); 'eye gaze-person'=19.75 (22.51%); 'eye gaze-other'=14.25 (16.24%). Both interlocutors frequently employed eye gaze-type modalities.

Despite Participant O being able to use speech to communicate, the data shows a higher use of 'AAC-encoding' than 'speech' ('AAC-encoding'=4.25 (6.27%); 'speech'=1.75 (2.58%)). An equal number of coded instances were recorded for 'AAC-encoding' and 'AAC-output' use by the AS (mean=4.25 (6.27%)). The NS had some minimal input to 'AAC-encoding'=0.25 but no instances of 'AAC-output' were recorded.

Excerpt 5.2.4c (FN; Session 1; 'The Squirrel Story') shows the frequent use of eye gaze by both interlocutors, towards the storybook and each other. The multiple modalities employed by the AS and NS are also shown, with evidence of speech, gesture, AAC-output, eye-gaze and vocalisation within this excerpt of transcript.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
28	NS	<u>LISTEN</u>	NS directs AS' hand away from device	I
29	AS	'fence'		OD
30	NS	[O]		AI
31	AS	['fence'] ['fence']	looks at NS	OD
32	NS	[can you] tell J (point) [what's in] this picture	looks at AS then points to page	I
33	AS	['fence']		OD
34	AS	(*vocalisation) (point)	looks at book and points to page	RI

35	NS	what's in that picture?		QW
36	AS	'house' [(*/vocalisation)]		RW
37	NS	[there's] a house yes		A
38	AS	(point) [(*/vocalisation)]	points to another part of the page	RW

Excerpt 5.2.4c Transcription example of eye-gaze use by both interlocutors within multimodal communication

The differences between ranges shown for each communicative modality reveal some variable usage across the four data collection sessions: AS: 'eye gaze-device'=21; 'eye gaze-other'=14; 'eye gaze-person'=17; NS: 'eye gaze-person'=31; 'eye gaze-other'=18; 'speech'=16.

Both participants employed multiple communicative modalities during narrative construction. The frequent use of eye gaze modalities showed similarities between interlocutors, although there was variation in frequencies of eye gaze-type coded for each interlocutor. The most frequently coded modalities were those with the greatest variability as indicated by range.

#### RQ2 Narrative Condition – Communicative Modality

In order to address RQ2, examining the effect of narrative condition on construction, the set of results presented below are for the measure of communicative modality, shown in table 5.2.4e.

Codes	Personal						Fictional					
	AS		%	NS	%	AS	%	NS	%			
Speech	0.50	(0-1)	1.49	13.00	(7-23)	28.11	1.25	(1-2)	3.65	11.00	(8-18)	26.51
Vocal Gesture	1.75	(0-3)	5.22	1.00	(0-3)	2.16	1.25	(0-2)	3.65	0.25	(0-1)	0.60
Co-Action	-	-	-	-	-	-	-	-	-	-	-	-
AAC-Encoding	2.50	(1-4)	7.46	-	-	-	1.75	(1-3)	5.11	0.25	(0-1)	0.60
AAC-Output	2.50	(0-5)	7.46	-	-	-	1.75	(0-3)	5.11	-	-	-
Eye Gaze - Person	6.50	(0-17)	19.40	14.00	(2-33)	30.27	2.25	(1-4)	6.57	5.75	(2-13)	13.86
Eye Gaze - Device	16.50	(12-25)	49.25	8.75	(6-12)	18.92	7.75	(4-12)	22.63	4.25	(0-7)	10.24
Eye Gaze - Other	1.50	(1-3)	4.48	2.25	(0-5)	4.86	12.50	(8-20)	36.50	12.00	(8-18)	28.92
Facial & Body Gesture	1.25	(0-3)	3.73	4.50	(0-11)	9.73	1.50	(0-3)	4.38	3.50	(1-10)	8.43
Sign	-	-	-	2.25	(1-4)	4.86	-	-	-	1.00	(0-2)	2.41
Env. Reference	0.50	(0-2)	1.49	0.50	(0-1)	1.08	4.25	(0-10)	12.41	3.50	(1-7)	8.43
Other Neutral	1.00	(0-2)	-	-	-	-	-	-	0.25	(0-1)	-	-
Other NPC	-	-	-	-	-	0.25	(0-1)	-	-	-	-	-

Table 5.2.4e Summary of mean (range) coded instances of communicative modalities and other coded categories according to narrative condition

The mean of coded instances for the two narrative conditions was 157 (PN>FN = 80.75>76.25) showing a small difference of 4.50 between the conditions. There was a mean of 155.50 communicative modalities coded for all four sessions (PN>FN = 79.75>75.75) showing a small difference of just 4 coded instances between the narrative conditions.

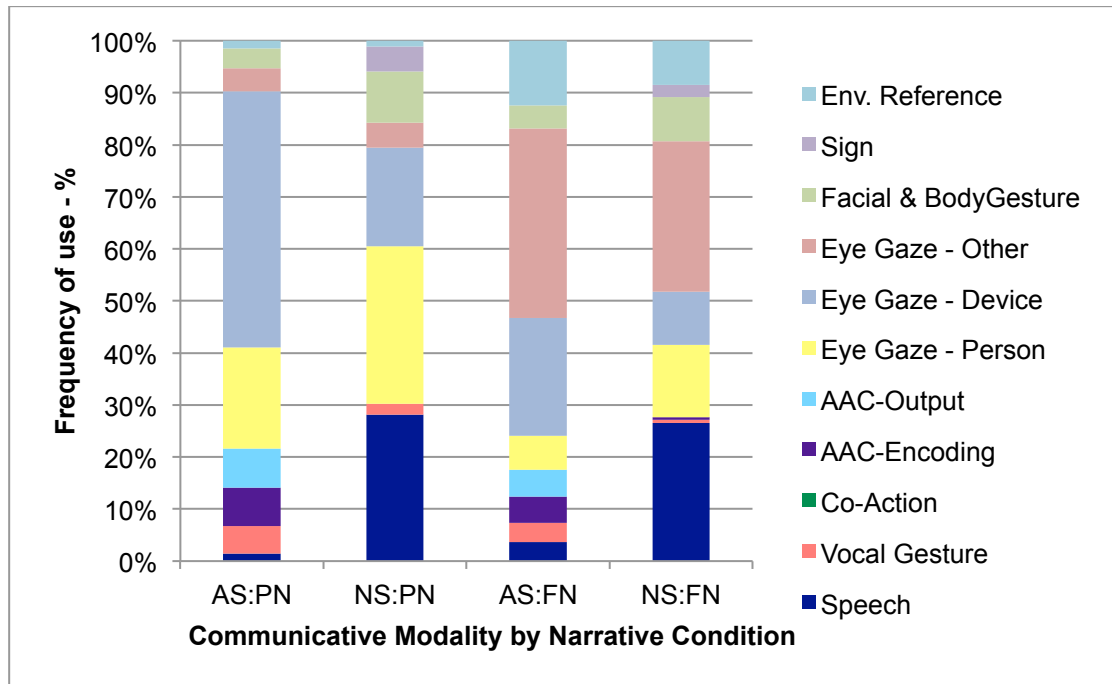


Figure 5.2.4d Distribution of communicative modalities according to interlocutor and narrative condition - %

Figure 5.2.4d shows the distribution of communicative modality use between narrative conditions for both interlocutors. Few substantial differences were observed between interlocutors by condition. The biggest shown for PN were: 'speech': AS<NS = 0.50 (1.49%)<13.00 (28.11%) and 'eye gaze-device': AS>NS = 16.50 (49.25%)>8.75 (18.92%). Under the FN condition 'speech' was the only modality to show a notable difference: AS<NS = 1.25 (3.65%)<11.00 (26.51%).

As shown above, when the data are separated by narrative condition, the majority of communicative modalities are employed with similar frequency between interlocutors. Mean coded communicative modalities was also found to be very similar across the two narrative conditions.

Codings of communicative modalities showed similarities across both conditions, for AS: PN<FN = 33.50<34.25 revealing a small difference of just 0.75 between conditions. In contrast, a greater mean coded communicative modalities was shown for PN: NS: PN>FN = 46.25>41.50, giving a small difference of 4.75 between conditions.

Only one modality, 'eye-gaze-other' showed a notable difference between the conditions by interlocutor: AS: PN<FN = 1.50 (4.48%)<12.50 (36.50%); NS: PN<FN = 2.25 (4.86%)<12.00 (28.92%). This difference may be accounted for by the presence of the storybook during FN. This will be explored further in Chapter Six (Discussion p.200).

All results for the measure of communicative modality show very little difference between conditions. Descriptive analysis shows that the narrative condition had little effect on the communicative modalities used by Participant O or the NS.

### *Summary*

The NS showed a higher mean coded communicative acts than the AS across all narrative construction (AS<NS = 67.75<87.75). Communicative modalities involving eye gaze were the most frequently employed by both interlocutors. The AS and NS used multiple communicative modalities throughout all narrative constructions. The range calculated showed variation in communicative modality use across data collection sessions. Participant O employed a higher mean coded instances of 'AAC-encoding' than 'speech', despite being able to employ this modality successfully.

Very limited difference was shown in terms of communicative modality use under the two narrative conditions. Only 'eye gaze-other' showed a higher mean coded instances during fictional narrative construction. This can be attributed to the presence of the fictional storybook under this condition.

### *RQ3 Integrated Profile of Narrative Construction*

Review of the full transcripts indicated integration between communicative modality and linguistic move use. Observed patterns showed the interlocutors employing specific communicative modalities as part of initiation-response pairs

within the interaction. Excerpts are provided to illustrate suggested links between outcome measures. Fully annotated transcripts are shown in appendices C12.1-C12.8.

- *Use of gesture*

Both interlocutors employed a number of different gesture types to support narrative construction. ‘Environmental reference’ was used by the AS and NS under the fictional narrative condition, but in conjunction with different linguistic move-types. The AS pointed to pages of the storybook to provide narrative information (‘inform’ (In)), or as part of a response to NS questions and instructions (‘response to instruction’ (RI); ‘W-reply’ (RW)). The NS used pointing for two purposes: firstly, as part of feedback provision (‘acknowledge’ (A); ‘comment’ (Co)); secondly, to provide context when giving an instruction (‘instruct’ (I)). Excerpt 5.2.4d (FN; Session 1; ‘The Squirrel Story’) provides evidence of both NS and AS use of ‘environmental reference’ towards the storybook in conjunction with different linguistic move-types.

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
4	AS	THE SQUIRREL STORY (point)	points at title and looks at NS	In
5	NS	that says squirrel story (point) look begins with a [/s/ doesn't] it	points at title on first page	Ex QYN
6	AS	[yeh]		RY
7	NS	that's right	turns page with AS	A
8	NS	right (.) ok O can you tell J <u>WHAT'S HAPPENING</u>	gestures around the pages with hand	R AI I
9	AS	(point) (*vocalisation) (.) mummy	points at character on page	RI
10	NS	it's mummy		A
11	AS	baby (point)	still pointing at characters	RI
12	NS	and the baby		A
13	AS		accesses AAC device	
14	NS	can you see [the] (point)	points at page	I
15	AS	[‘fence’] (.) [(‘vocalisation’)] (point)	points at page and looks at NS	In
16	NS	[uhhh there's] the fence I can see the fence (point)	points at page	A Co

Excerpt 5.2.4d Transcription example showing AS and NS use of pointing gesture in conjunction with specific linguistic move-types

This supports the data showing an increase in ‘environmental reference’ under the fictional narrative condition (table 5.2.4e). Both interlocutors also used the storybook to open and close narrative construction. The NS used opening and positioning of the book to initiate AS narrative construction (‘ready’). The AS and NS also closed the book to signify the end of at least one of the recorded fictional narratives.

Due to the high frequency use of gesture by both participants these modalities were coded in conjunction with a wide range of linguistic move-types. In excerpt 5.2.4e (PN; Session 1; ‘a Birthday’) the interlocutors employ gesture and Makaton signing in conjunction with both initiation and response move-types. Some influence of the interlocutor’s modality use on that of the other could be suggested, as both use signing and gesture throughout this section of transcript. Further discussion of this will be provided in Chapter Six (Discussion).

Line	Speaker	Dialogue	Non-vocal Acts	Move-Type
20	AS	(*vocalisation) TEN	looks at NS and uses fingers to gesture 10	RW
21	NS	you had 10 as well		A Co
22	AS	[(*vocalisation)]		
23	NS	[same as] <u>SAME</u> as <u>ME</u> did you?	uses Makaton signs for ‘same’ and ‘me’	Co C
24	AS	yeh		RY
25	NS	wow		A
26	NS	<u>WHAT</u> what did you have in your presents?	uses Makaton sign for ‘what’	QW
27	AS	(*vocalisation) SLEEP	uses Makaton sign for ‘sleep’	In
28	NS	<u>SLEEP?</u> you went to sleep?	uses Makaton sign for ‘sleep’	O QYN
29	AS	yeh		RY
30	NS	what did you have inside (.) <u>INSIDE</u> your birthday box?	gestures unwrapping a present	QW
31	NS	<u>WHAT</u> was there?	uses Makaton sign for ‘what’	QW
32	AS		looks at device and goes to access	

Excerpt 5.2.4e NS and AS use of gesture and Makaton signing in conjunction with a range of linguistic move-types



## *Summary*

Few specific patterns of communicative modality and linguistic move-type use were identified for Participant O and the NS, under the two narrative conditions. Speech was the dominant communicative modality for the NS and was employed to produce all linguistic move-types. However, a link was found between pointing ('environmental reference') and specific linguistic move-types under the fictional narrative condition. Both interlocutors employed 'environmental reference' in conjunction with different linguistic move-types. The high frequency of 'environmental reference', gesture and signing employed by the AS and NS meant that these modalities were shown to co-occur with a variety of both initiation and response move-types.

The narrative condition had some impact on the co-occurrence of specific communicative modalities and linguistic move-types. During fictional narrative the presence of the storybook lead to increased use of 'environmental reference'. This modality was evidenced co-occurring with 'acknowledge', 'comment' and 'instruct' moves for the NS and 'inform' or response-type moves for the AS. The fictional stimulus was also employed to support the initiation and closure of narrative constructions.

## **5.4 Summary**

Despite the variation in participant demographics (appendix B8), i.e. diagnosis, expressive and receptive language skills, and time using their communication device, the findings demonstrate some similarities during narrative construction. In response to RQ1, clear communicative roles were identified between NS and AS participants. Regarding linguistic moves, the NS participants mainly used initiation move-types, making a minimum of three times the initiations produced by AS participants. In particular, query-type moves were almost entirely made by the NS to elicit AS narrative construction. As a result, the AS participants were cast in the role of respondent. All AS participants produced the initiation-type move 'inform' during narrative constructions, demonstrating the provision of some independent narrative information by the AS. However, frequency of 'inform' moves varied across the participants. The NS produced the majority of feedback moves consistently across all participants. It is suggested that the NS role as

teacher and AS role as pupil may have impacted on the communicative roles taken in narrative construction; this is discussed in Chapter Six (Discussion). Differences in linguistic move use found between conditions and participants varied across dyads.

Despite the difference in communicative roles played, all NS and AS interlocutors employed a wide range of communicative modalities across both narrative conditions. All AS participants used either nine or ten of the modalities coded and NS participants used between nine and twelve communicative modalities. Speech was the dominant modality for all NS participants. However, this was much more varied for the aided speakers who relied on a range of modalities. The three types of eye gaze coded were frequently used modalities by both AS and NS in all dyads. Participant S who did not use speech, used more eye gaze acts than the other participants. The coded moves: 'repetition' and 'overuse of device' were only recorded during the narratives of Participants J and O. This could be linked to the primary diagnosis of these participants, which will be discussed in the following chapter.

Data in response to RQ2 showed resonances in the communicative roles played by the interlocutors between narrative conditions. Use of linguistic move-types and communicative modalities reflected interlocutor role and was not notably affected by narrative condition. In cases where some difference was found in mean total coded communicative acts this could most often be shown in the modality 'eye gaze-other'. This modality was impacted by the presence of the storybooks during fictional narrative construction, providing participants with an object to look at.

Integrated profiles of narrative construction showed that hand gestures, including 'sign' and 'environmental reference' were most commonly linked to specific query-type and instruction moves used by NS participants. AS participants used the same pointing gestures. However, these were made in conjunction with response move-types or to provide context during the production of narrative information ('inform'). Links were identified between the use of eye gaze towards the other person and acknowledgements (NS) or positive responses ('Reply-Y' (AS)). The use of eye-gaze towards the device co-occurred with the provision of instructions for all NS participants on at least one occasion. Some

differences identified between conditions for the integrated use of communicative modalities and linguistic move-types could be attributed to the presence of the storybook in fictional narrative. For example, increased environmental reference and eye gaze towards the storybook provided an increased chance of co-occurrence between these modalities and linguistic move-types.

The next chapter discusses the findings in relation to the research questions. Implications for speech and language therapy, education and AAC device manufacture are also considered.

# Chapter Six

## Discussion

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### 6.1 Introduction

This chapter discusses the findings presented in Chapter Five. The Comprehensive Assistive Technology (CAT) model (Hersh and Johnson, 2008) provides the theoretical background through its simple, unified framework encompassing all aspects of assistive technology use and development (Hersh and Johnson, 2008). It comprises four primary categories; person, context, activities and assistive technology. Reference will also be made to Scherer's (1993) Matching Person and Technology (MPT) model, which defines the milieu, person and technology as salient factors in the acceptance or rejection of an AAC device. A diagram of the relationship between the CAT and MPT frameworks is shown below.

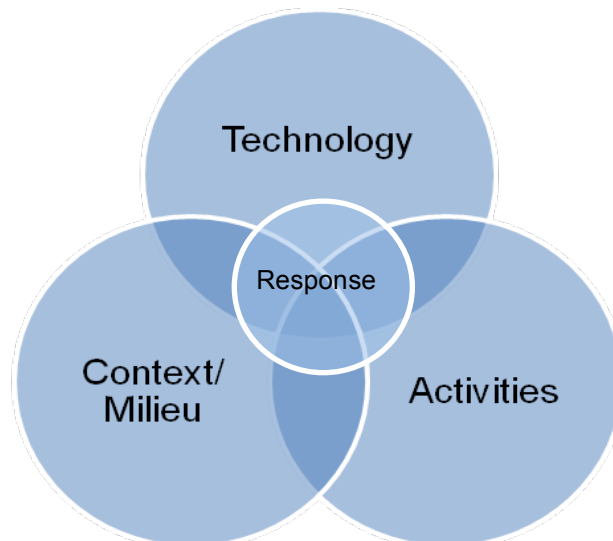


Figure 6.1a Venn diagram showing the combined features from the CAT (Hersh and Johnson, 2008) and MPT (Scherer, 1993) models of assistive technology use

Figure 6.1a recognises the contribution of both external and internal factors to human functioning. In the current study, 'technology' refers to the electronic device being used for communication; 'activities' refers to the tasks completed under the two narrative conditions; 'context' refers to the communication

environment within which the narrative interactions took place and includes the NS' role of teaching staff in the educational context. The central 'person' category, which overlaps with the three other factors, encompasses all personal characteristics of the narrative production and the roles played by the NS and AS. The ways in which the 'context', 'activities' and 'technology' influence the resulting 'person' characteristics are discussed. The research questions are addressed consecutively under each section representing a component of the CAT model (Hersh and Johnson, 2008).

### **RQ 1 Communicative Roles**

The roles occupied by the AS and NS participants during narrative construction were examined using three outcome measures. These were communicative modality, linguistic move-type and measures of linguistic complexity. Analysis of linguistic moves highlighted different roles between interlocutors, i.e. NS as initiator and AS as respondent. The NS participants used a high level of questioning in order to facilitate narrative construction. All AS participants produced some independent narrative input ('inform' moves). The three participants for whom lexical variety was analysed (Participants S, J and O) showed considerably lower use of function words than content words.

The results of the momentary time sampling revealed the use of multi-modal communication by both NS and AS during narrative construction across the participant dyads. Some variation between participants was shown in terms of preference for particular communicative modalities. However, eye gaze was found to be a frequently used communicative modality by all interlocutors.

### **RQ 2 Narrative conditions**

The two narrative conditions, personal narrative and fictional narrative, showed limited differential impact on interlocutor use of communicative modality, linguistic move-type and linguistic complexity; however, some participants constructed notably longer narratives under one condition than the other.

Communication was multimodal for all participants under both conditions. The use of communicative modality appeared to be associated with narrative condition, with the majority of NS and AS participants showing increased 'environmental reference' and 'eye gaze-other' during fictional narrative in

comparison to personal narrative. Whilst a differential pattern in linguistic move-type usage was not detected across the participant dyads for the two conditions, some individual differences were identified in the use of specific move-types between narrative conditions. This highlights the individuality of narrative construction, discussed further in sections 6.5.

### **RQ3 Integrated profile of outcome measures**

In order to examine narrative construction as a complete process, an integrated profile of the two principal outcome measures was produced for each participant. This mapped the correspondence between linguistic move-type usage and communicative modalities employed. Use of various eye gaze-types and hand gestures showed strong linkage to linguistic move-type. Whilst there was individual variation across dyads, all NS participants made 'hand gesture' towards the fictional stimuli in conjunction with 'query-type' moves. In addition, those AS participants who were able to employ 'environmental reference' also used this towards the storybook in response to NS questions.

Narrative condition appeared to be a factor. The presence of the storybook under the fictional condition seemed to affect the use of specific communicative modalities. For example, NS questions were employed with 'environmental reference' towards the storybook, providing context for the narrative although there was variation across the participant dyads.

## **6.2 Person**

The 'person' category focuses on the individual characteristics of the interlocutors in relation to narrative construction. This section is presented first as all three parts of the CAT model: context, activities and technology, are directly related to the individual.

The developmental condition or diagnosis of the AS participant may be a source of influence over the narrative interactions. Within ASC, typically, language development proceeds normally in the first year of life, but regresses towards the end of the second year (Bogdashina, 2005). In contrast, children with cerebral palsy experience difficulties due to the constraints of limited motor abilities and the impact of these on the exploration of the environment, play interaction and the

physical production of communication (Pennington and McConachie, 2001, Pennington, 2008). This is particularly relevant for participant S, for whom speech was not a viable means of communication. As a result, she may have relied on idiosyncratic non-verbal or behavioural means of expression prior to the provision of an alternative communication system (Pennington, Goldbart and Marshall, 2004). The impact of Participant S's physical difficulties and reliance on professional provision of AAC may restrict access to a means of developing expressive language (Von Tetzner and Grove, 2003). In contrast, the three remaining participants had fewer physical difficulties, allowing them to develop verbal communicative output. As a result, they may therefore have been able to develop language through trial and error from a younger age than Participant S, who was reliant on non-verbal communication methods. Despite variability in initial language acquisition environments, as individuals with communication difficulties the current participants may have experienced more similar linguistic input within a special education context and as aided communicators. It is therefore this body of literature that is linked to the findings.

Language acquisition is acknowledged to be more complex for aided communicators than their typically developing peers. This can be attributed to the effects of disabling conditions, differences in the language environment and lack of a consistent model from an adult who uses AAC (Bedrosian, 1997). Smith (2003) identified two key differences in the language input received by AS children; increased maternal directiveness through increased demands, imperatives and initiation, and low semantic contingency between maternal and child utterances. These two factors have previously been found to lead to slower language acquisition in typically developing children (Conti-Ramsden, 1994). High frequency of questions, instructions and NS initiation were recorded in all participant dyads, reflecting the pattern of linguistic input identified by Smith (2003) and corroborating other existing studies of parent-child using AAC interaction (Pennington and McConachie, 1999, Rosa-Lugo and Kent-Walsh, 2008). In contrast, some use of semantic contingency was observed in all dyads, with the NS continuing and expanding on topics or vocabulary provided by the AS. This may be attributed to the context provided by a narrative construction task, making it easier for NS participants to understand and add relevant vocabulary and scaffold AS productions. This is explored further in the following section examining the educational context.

The NS frequent use of query-type moves may be associated with the single keyword and short utterances employed by most AS participants within this study. This has also previously been attributed to the restrictions to language acquisition experienced by children who use AAC (Beukelman and Mirenda, 2005, Waller and O'Mara, 2003). In the current study, three of the four AS participants provided all narrative information through single keywords or short utterances. Consequently, conversation partners were required to ask a large number of questions in order to clarify their understanding of the short utterances, as previously recognised in AS:NS interaction by (Beukelman and Mirenda, 2005). When AS initiation moves were produced these again required questions from the NS to co-construct the meaning of the single word. Von Tetzchner and Martinsen (2000) acknowledged this strategy as 'topic setting' by the AS followed by NS co-construction. Although Participant B produced considerably longer utterances, due to his limited speech intelligibility the NS was still required to use multiple questions to clarify his contributions and therefore co-construct meaning.

It has been suggested that due to their role as respondent to NS initiations, aided communicators hold a more passive role in communication. This reduces the presence of topic initiation and control of conversation within the communicative turns of the person who uses AAC (Bellon-Harn and Harn, 2008, Muller and Soto, 2002, Clarke and Kirton, 2003, Light et al., 1985a, Waller and O'Mara, 2003, Beukelman and Mirenda, 2005). This is supported by the AS participants taking typically half the initiations of the NS. However, AS use of 'inform' moves suggests active narrative construction. This highlights the fact that all AS participants produced some narrative contributions, independent of NS questions or directive moves.

Limited function word use and syntactical structure identified in the data may also be linked to the many developmental restrictions experienced by children who use AAC. Lack of function words has previously been attributed to prioritisation of keywords to reduce navigation or AAC-encoding and as a method of increasing speed of interaction (see section 6.4 for further discussion). Lack of grammatical content from the AS within interaction is a phenomenon recognised by a number of authors (Soto and Hartmann, 2006, Beukelman and Mirenda, 2005). The findings of the current study corroborate those of Soto and Hartmann



(2006), who found a high use of single word utterances and few story-grammar elements in the narratives of four children who use AAC devices. The considerable difference between content and function word use observed in this study suggests similar low use of syntactical structure. Although the content – function word disparity was previously recognised in published studies of conversational interaction (Murray and Goldbart, 2006), it had not previously been quantified in narrative interactions.

Despite speech being the primary communicative modality for all NS participants, they also used the communication device for both error correction and to produce ‘AAC-output’. This contrasts the findings of Sutton et al. (2002) who suggested that AS users have restricted access to an exact model of communication output. For example, a typically developing child copies the speech of numerous adult models. In contrast, a child who uses AAC is unlikely to have an adult model that uses AAC while they are developing their communication. Error correction is also likely to be given to the child who uses AAC through speech, and so development through trial and error is also limited (Sutton et al., 2002). The findings from the current study may therefore suggest a new model of adult communication is being presented to the AS participants – one that demonstrates AAC usage. This is resonant of the findings of Bunning and Ellis (2010) who identified the adaptation of NS communicative modality in response to children using AAC. Of course, the impact of NS modelling may be dependent on time using AAC and NS and AS experience of working together.

Communicative modality showed further shared features across participant dyads despite considerable demographic differences (appendix B8). The multi-modal communication displayed by the AS is consistent with findings reported by Light et al. (1985c) and Clarke and Kirton (2003). In particular, use of natural modes, such as ‘eye gaze’, resonates Clarke and Kirton’s (2003) findings that these are employed most frequently by children who use AAC. However, for participant S, use of natural modes, such as gesture, was limited by her cerebral palsy. Pennington (2008) explains that motor disorders associated with cerebral palsy can affect a child’s ability to send effective communication signals due to the restrictions on modalities, such as speech and gesture. Not surprisingly, and probably associated with her physical difficulties, Participant S showed a preference for modalities that demanded reduced motor effort, such as ‘eye gaze’,

over 'environmental reference' or 'body gesture'. Thus Participant S' use of 'eye gaze' may have acted as a compensatory strategy for her limited access to more complex motor forms of communication. This is likely to be a factor in her producing some narrative input, especially during fictional narrative, in which other participants, not as physically challenged, used 'environmental reference' to support their narrative.

Eye gaze was the modality used most frequently by both AS and NS across the dyads during at least one of the narratives. However, the variation in 'eye gaze' type used by participants may be attributable to individual condition. For example, children with ASC show delays and limits to their development of shared attention and eye contact which are vital in moving from the pre-intentional to intentional stages of communication during early language acquisition (Bogdashina, 2005). This deficit in shared attention and eye contact was clearly visible in the findings. Participant J and O employed the lowest frequencies of eye-gaze towards the NS, at least three times lower than Participants B and S. Participant J and O's reduced use of 'eye gaze-person' may therefore be symptomatic of the communication difficulties associated with ASC (Mitchell et al., 2006). In contrast, the reliance of children with Cerebral Palsy on caregiver cues and interactional scaffolding as identified by Pennington and McConachie (1999) may explain the increased readiness of Participant B and S to look towards the NS during interaction.

The function of eye gaze appeared to vary across participants. It was utilised by the AS to check for NS attention during long periods of AAC encoding and as a fast method of confirming agreement or disagreement during the narrative activity. During linguistic moves in which the AS agreed with the NS, eye gaze would often be employed alongside a positive facial expression, e.g. a smile. Another function was checking back with the NS that the AAC-encoding was correct, as used by Participant J. This may have been due to his limited experience of both narrative construction and the AAC device in use. The impact of experience with the AAC device and available vocabulary is explored further in section 6.4. One suggested reason for the frequent use of eye gaze may be the slow speed of interaction experienced by people who use AAC and their NS partners. As an issue this was highlighted previously by Murray and Goldbart (2009a) who identified slower rate of communicative exchange as a limitation to

successful AAC use. In the current study, it is possible that eye gaze was employed to produce faster communicative turns during narrative interactions for the purpose of checking and maintaining mutual attention, or to compensate for the slow output of using other modalities, e.g. speech, device encoding and output. However, it is beyond the scope of the current study to fully corroborate this.

Three of the participants in the study were able to use speech as a method of communication (Participants B; J and O). A comparison between words spoken and words emitted from the AAC device was conducted, in order to examine whether participants demonstrated a consistent preference for one of these two modalities. It was only possible to do this for two of the three speaking participants as the large amount of unintelligible speech produced by Participant B made it impossible to accurately quantify individual words. Despite this, the data collected regarding communicative modality for Participant B suggests a considerable preference for speech. In contrast, participants J and O showed a preference toward the AAC device over speech, with participant O demonstrating this consistently across the data collection sessions. This was also shown in the considerably higher mean instances of 'AAC-encoding' and 'AAC-output' in comparison to 'speech' for Participants J and O. This appears to contradict Clarke and Kirton's (2003) suggestion that vocalisation and 'natural' modalities of communication are favoured over AAC use. Of course this may be accounted for by individual differences in the sample. For example, Participant J showed most AAC preference during personal narrative construction in contrast to Participant O, who demonstrated a stronger AAC preference during fictional narrative interactions. Also, when considering all other modalities of communication employed, AAC use shows a lower total mean use than all natural methods together. However, only two AAC based codes were coded in contrast to nine natural methods of communication. This makes it difficult to accurately identify AS preference.

Difference in AAC preference amongst Participants B, J and O may be affected by individual attitude towards the device. As part of the MPT model, Scherer (1993) suggested the attitude of the individual who uses AAC toward their device had an influence on whether the device use was maintained or abandoned. Hersh and Johnson (2008) also assert the importance of attitude

within their CAT framework as critical to successful assistive technology use. It is possible that Participant B was less positive about using the device. Certainly, he chose to use speech for the majority of communicative acts. He also employed a wider range of gestures than both Participant O and Participant J, who were considerably more able in terms of motor skill. For Participant B 'AAC-output' was also the communicative modality with the lowest recorded instances, suggesting he preferred to use alternatives to the AAC device. The question of whether he really preferred the more 'natural' approach to communication is a point for debate; however, further development of this argument is beyond the scope of the current study.

Participant S's limited access to some communicative modalities was evident in the integrated profile of communicative modality and linguistic moves. The other AS participants employed environmental reference in order to provide context during provision of narrative information and when responding to NS questions. In contrast, due to her inability to access environmental reference, S employed an increased use of both eye gaze and vocalisation to communicate during narrative construction. In particular, this was observed when making requests for help, as both vocalisation and eye gaze towards the NS were coded with all coded instances of 'request for help'. No other participants were coded making requests for help, emphasising the considerable effort required when constructing narrative without speech. Access of the AAC device and the impact on narrative interactions is discussed further in section 6.4.

To summarise, all participants showed similarities in their use of multimodal communication and linguistic move use. A number of phenomena observed within the findings are closely associated with the patterns of language acquisition previously identified in existing research studies of individuals who use AAC. 'Person' factors such as developmental condition appear to have affected modalities used in the narrative interactions. The presence of the AAC device was also found to have a considerable impact on the observed narrative interactions.

### **6.3 Person and Context**

The context category of the CAT framework is similar to that referred to as the 'milieu' by Scherer (1993). Influences of the setting and environment are

examined by reviewing the AS:NS partnerships in relation to narrative construction. Currently, children who use AAC are reported to have limited opportunity to tell stories. Waller and O'Mara (2003) attributed this to a number of factors, including limitations of the AAC devices. This lack of opportunity experienced by children who use AAC is surprising considering the representation of narrative within the existing English National Curriculum of England and Wales (QCDA, 1999). However, within education there is greater emphasis on formal storybook reading as opposed to personal or fictional narrative construction. Ukrainetz et al. (2005) identified formal fictional narrative story telling in education as instruction directed activity, employed in order to transmit knowledge, encourage language development or directly for instructional purpose and recognised this as a context for language and literacy development. However, the more formal and structured types of language have also been recognised as a limiting factor in the advancement of language for the individual who uses AAC (Von Tetzchner and Martinsen, 2000). It is the more interactive and dialogic narrative experience that has been shown to provide the most language-rich context to facilitate language development for the child who uses AAC (Liboiron and Soto, 2006). The opportunities provided in the existing National Curriculum, led by educational attainment, may therefore be overly formal and structured to facilitate dialogic and interactive narrative development for users of AAC. The current study, therefore, examined both personal and fictional narrative construction; observing the interaction when the AS was asked to tell the story, as opposed to being told the story by the NS. The findings have shown this to have become a more dialogic co-construction as discussed in relation to the educational context below.

The roles of the NS and AS were defined by their various contributions to narrative interaction. NS participants dominated interactions producing more coded communicative instances and linguistic moves than their AS communication partners. This is resonant of Light's (1994) study, in which mothers produced almost three times more communicative acts than their children during familiar and unfamiliar storybook reading. This is also evident in studies of mother-child interaction, previously identified by Pennington and McConachie (1999) during the play interactions of twenty mother-child pairings. The participants who use AAC in Clarke and Kirton's (2003) study also produced significantly fewer initiations during conversations with their peers. These

phenomena extend to the educational context. For example, increased use of directive moves including questions and interrogative language was identified in research investigating teachers working with children with SEND (Hardman et al., 2005). Bunning et al. (2013) found teachers employed significantly more initiation moves during classroom interaction with students who had profound and multiple learning difficulties. This may suggest children who use AAC experience a similar asymmetrical partnership within educational as well as parental and peer contexts. Both the teachers and mothers in existing studies had access to a complete range of communication skills; in contrast, the AS was restricted both by the underlying condition and limitations of the AAC device. Therefore asymmetry of communication partnership may create an imbalance in the sharing of the conversational floor so that the person with a full skill set is inclined to occupy more space.

The NS participants used a high level of question-based moves, which in turn led to the majority of responses being provided by the AS participants. For three out of four dyads w-questions were the most commonly asked question type. Due to the more open nature of w-questions, these were used by the NS to elicit narrative language from participants. The increased use of non-specific questions has been shown to facilitate increased utterance length in a single case study by Smith (2003). This may therefore have been an elicitation strategy employed by the NS to facilitate language acquisition in their role as teaching staff. Yes/no questions were the other most frequently used question type. These were particularly noticeable in Participant S' dyad. For Participant S, AAC use was the principal modality available. Yes/no questions provided by the NS enabled a faster speed of interaction, as they required less encoding and therefore placed lower demands on the respondent in contrast to non-specific w-questions.

NS use of instructions and explanations may be accounted for by the NS' role as 'technician' within the interaction. The NS was more knowledgeable about the location of narrative vocabulary on the AAC device compared to the AS who had only briefly been introduced to these pages prior to data collection. Some 'AAC-encoding' instances and 'instruct' moves of the NS participants show them indicating which page the AS was to access. This technical role also included giving explanations and instructions during device breakdown, discussed in

section 6.4. Providing technical support could be considered part of the NS role as a member of the educational staff.

Furthermore, the educational context may also account for the use of directive moves within the interaction. Frequent employment of directives between teaching staff and SEND students was recognised by Hardman et al. (2005) during literacy hour. They suggested increased directive and interrogative moves such as yes/no questions could lead to reduced opportunity for initiation by children with SEND. This was reflected in the findings of the current study, suggesting people who use AAC may experience similar reduction in opportunity for initiation. Participants in the Hardman et al. (2005) study were younger children than the AS participants included in the current study. It is possible that the older age group may have influenced, albeit with a low level occurrence, the use of some initiations and question moves by the AS participants.

NS participants also used frequent responses that provided feedback to the AS ('acknowledge', 'praise', 'comment'). This adds another component to the role played by the NS within the partnership. The provision of feedback is likely to be linked to the educational context and recognised IRF tri-part sequence used in classroom discourse (Sinclair and Coulthard, 1975). This is discussed further in relation to the patterns of interaction observed, in the following paragraphs. The high frequency of feedback may have encouraged AS participants to continue the narrative task. This was especially relevant for Participant J where feedback was used to maintain his attention. The NS partner of Participant S also provided high levels of 'praise' and 'acknowledgement'. This may be accounted for by the lengthy process and effort involved in 'AAC-encoding' leading to the NS providing feedback at each stage of encoding. NS participants provided feedback to 'AAC-encoding' and other moves made through non-verbal communication as opposed to just completed turns providing narrative content, which could be expected in NS teacher: TD student interaction. This suggests the IRF framework may have been extended in the current study as the NS participant would occasionally produce more than one feedback move in relation to a single AS response move. AS participants provided few feedback moves throughout the interactions, despite NS participants employing some 'inform' moves and producing narrative input. It is possible that this may be related to the educational context and the dispersal of power within the dyadic relationship. NS participants, as teaching staff, may be

imbued with power as the instructor of the learner - the AS participant (Walsh, 2006).

The construction of narrative observed in the current study involved a scaffolding approach, which has been identified by a number of authors examining narrative language produced by children with complex communication needs (Soto and Hartmann, 2006, Bellon-Harn and Harn, 2008). Bedrosian (1997) highlights the scaffolding and co-construction of language as the context in which language is learned and developed by aided speakers. In contrast, Von Tetzchner and Martinsen (2000) observed that due to the formal nature of language experienced by children who use AAC in contrast to their typically developing peers, scaffolding strategies may not automatically enable the user. In the current study, the majority of narrative language was scaffolded through the IRF framework. IRF framework is reported to be the most frequently occurring pattern of interaction within the mainstream educational environment (Walsh, 2006) and has previously been identified within SEND classroom discourse by Bunning and Ellis (2010). This tri-part sequence was evident in all transcripts for all dyads, supporting this as the predominant pattern of interaction. The initiation moves employed by NS participants showed recurrent use of questions, creating two possible links to the context of the interaction. Firstly, narrative elicitation with children who use AAC is known to include high frequency use of questions and interrogatives from the conversation partner (Grove, 2006). In addition to this, the research task had a clear goal: the production of a narrative from the AS participant. This pedagogic goal is likely to have led to increased use of questions by the NS and also influenced the type of questions employed in order to ensure the task aim was achieved (Walsh, 2006).

The nature of the IRF framework in which teachers take two moves for each single student move, has been seen as restrictive (Walsh, 2006). This may be particularly relevant when the aim of interaction is to facilitate a creative and complex language type such as narrative. The NS participants employed considerably more initiation and feedback/follow-up moves in contrast to AS participants, who produced more response moves. In isolation, this pattern could indicate NS dominance and control, which would support the findings of Smith (1994) who, during a qualitative study identified teachers using restrictive interaction strategies allowing the augmented communicator minimal control.



However, 'Inform' was the most frequently used initiation by AS participants. This demonstrates that despite the predominance of IRF sequences, the AS participants did produce some aspects of narrative language independently. Use of 'inform' moves showed considerable variation between participants but indicates that they were able to contribute to narrative construction despite variation in individual demographics. Through use of the IRF framework, the NS was able to frame the narrative. Use of further questions within feedback moves has been recognised as encouraging further development of students' ideas resulting in increased discussion (Nystrand et al., 1997).

AS participants' employment of initiation moves and consistent responses within the IRF framework suggest that although predominantly a 'respondent', they played an active role within the interaction. This resonates the findings of Liboiron and Soto (2006) single case study during shared familiar storybook readings, in which the participant also produced a number of phrases elaborating the story. 'Inform' moves of the participants in the current study, show similar active construction of the narrative. The active role of the AS participant appears to contradict previous research of AS:NS adult interaction, which suggests individuals who use AAC have a tendency to hold a passive role in conversational interaction (Ninio and Bruner, 1978, Clarke and Kirton, 2003, Carter, 2003, Light et al., 1985a). It may be that the setting condition of the current study is a factor, i.e. the focus on narrative interaction, encouraging AS ownership of their role in telling the story; however, it is beyond the scope of this study to make such a conclusion.

The wider context, including statutory frameworks of the educational environment, is also likely to have affected the way in which the interactions were completed. Narrative appears as a medium for attainment at various levels within the existing National Curriculum as well as being implicit within the recommended social constructivist teaching-learning pedagogy of current classroom practise. For this reason, the opportunity for children who use AAC to take part in narrative interaction and construction is important to enable them to both achieve and develop their language skills as far as possible. This resonates with the Bercow Report which identifies the need to remove the perceived barriers and restrictions to the National Curriculum for children with SEND (Bercow, 2008).

When the participants' narrative constructions were looked at in relation to Applebee's six levels of narrative development (Applebee, 1978), an inconsistent presentation of narrative elements from multiple levels was identified. For example, the majority of narratives were produced in co-construction with limited overt 'sequencing' or 'chaining', which are described by Applebee (1978) at the second and fifth levels of narrative development. The lack of sequential detail included by AS participants, which may be attributed to the use of single keywords and short utterances, could place these narratives within the lowest level of narrative development; 'heaps'. However, three of the four participants also included emotional content in relation to the narrative, either describing their own emotional response or that of the principal character. The inclusion of emotional links to characters and events are included within 'focused chains' at the fifth level and more comprehensively within 'true narratives', the final stage of narrative development (Applebee, 1978). These findings suggest a disparity between the narrative understanding and narrative expression of individuals who use AAC. This is an important consideration in relation to the grading of attainment for children who use AAC, due to the significant barriers to linguistic performance that in typically developing children may also be used as markers of linguistic competence.

Linguistic performance is a more complex process for an aided communicator in contrast to their typically developing peers. Whilst the individual using AAC may have the linguistic competence to construct a complete and accurate phrase, it is then necessary to decode and translate the message for conveyance on the AAC device, which may have limited availability of vocabulary and grammatical structures (Von Tetzner and Grove, 2003). Thus, assessment of linguistic competence in children who use AAC is not possible and can only be made through linguistic performance. This has implications for measuring educational attainment in the English National Curriculum because of a reliance on linguistic performance as a medium for achievement. In order to remove barriers to the national curriculum (Bercow, 2008), it is therefore suggested that children who use AAC should be assessed more on their 'communicative competence' defined by Light (1989) as:

“the quality or state of being functionally adequate in daily communication, or of having sufficient knowledge, judgement, and skill to communicate” (p.138)

Therefore, assessment would take into consideration the individuals’ ability to employ the four aspects of communicative competence: linguistic, operational, strategic and social (Light, 1989). The four AS participants show evidence of these competencies that may be missed, or considered inconsistent, under Applebee’s (1978) levels of development. However, to say further is beyond the scope of the current study. AS competence is also closely related to the role of the NS, impacting further on the ability to assess true AS competence.

NS participants predominantly employed communication patterns that followed the hierarchy expected within the educational environment. This hierarchy places speech as the most commonly used communicative modality as it is the most automatic (Flewitt, 2006). NS participants also employed numerous other communicative modalities, but speech was the most frequent. AS participants employed a more equal spread of multiple communicative modalities. It is possible that the communicative modalities employed by one interlocutor may have influenced those used by the other, corroborating the findings of Light et al. (1985c). The reflection of multimodality between interlocutors resonates with Bunning and Ellis (2010) and Bunning et al. (2013) who identified teachers adapting communicative modalities as a form of scaffolding during classroom interaction with students with severe to profound and multiple intellectual difficulties. The NS also employed ‘AAC-encoding’ and/or ‘AAC-output’, which indicated modelling through use of a modality that it is not necessary for them to use, to which AS users often have limited access during language acquisition (Sutton et al., 2002), as discussed in section 6.2.

The integrated profile of linguistic move and communicative modality outcome measures also highlighted the NS role as teacher. NS participants frequently employed hand gesture towards the AAC device in conjunction with instructions. This may be attributable to the NS trying to re-focus the AS to the task of telling the story by directing the AS’ eye-gaze towards the device. The NS with Participant B often used instruction with hand gesture to encourage device use, especially when speech had not been understood. The NS moved from

pointing with a single finger to using a whole hand gesture in order to ensure AS attention towards the AAC device. This NS took a strong 'teaching' role, and on at least two occasions ignored verbal communication from the AS and gave further instruction to use the AAC device. This echoes the 'teaching' parental role described by Smith (2003) in reference to a maternal conversation partner who ignored some communication attempts produced using methods alternative to the AAC device in order to develop the skills of the person using AAC.

NS participants also showed integration of communicative modality and linguistic moves in their use of scaffolding strategies and feedback provision. These are again linguistic tools that have previously been linked with the role of the NS as teacher (Berry, 2006, Bunning et al., 2013). NS participants employed environmental reference to provide non-verbal cues to the AS alongside w-questions. This was more evident during fictional narrative during which the NS would point to a page of the storybook while asking a w-question. Further use of the storybook was shown by all NS participants in initiating and/or closing narrative production. During this process the NS was recorded either opening and moving the book towards the AS while providing a 'preparation' move, or closing the book while giving praise or comments at the end of the narrative. These non-verbal scaffolding practices have not been examined in the production of narrative. However, they were employed in conjunction with open comprehension style questions, identified as a scaffolding strategy in multiple existing studies for encouraging AS device use and language acquisition (Liboiron and Soto, 2006). NS participants also employed environmental reference during the provision of feedback moves (e.g. 'praise', 'comment'). This was frequently coded with eye-gaze towards the AS. This further emphasises the NS role as teacher in scaffolding and facilitating narrative construction through encouragement and feedback provision, and indicates use of the IRF discourse structure as discussed above.

The integrated profile of the interactions also indicated that the educational context had an impact on the AS participants' role in narrative construction. Environmental reference, used to give non-vocal cues by the NS, was employed by AS participants to provide context to narrative information, either through 'inform' moves or in response to NS questions. Participant B recorded the highest mean use of environmental reference of the AS participants. This may have been

employed by B as a strategy to support his verbal communication due to his poor level of speech intelligibility. The provision of context can improve understanding and may therefore have supported his narrative construction.

NS participants frequently used eye gaze towards the other interlocutor during feedback provision. All AS participants employed some eye gaze towards the NS alongside response moves. However, for Participants S and J the use of eye gaze towards the NS was most frequently employed in conjunction with initiation moves requesting help or confirmation. Participant S employed eye gaze to the NS with all coded instances of requests for help. Eye gaze was Participant S' access method and by moving her gaze from the AAC device to the NS and vocalising, she was able to request help. For Participant J, eye gaze to the NS and pointing to buttons on the device was employed in conjunction with all coded 'check' questions. Eye gaze to the NS enabled fast confirmation to be given before J completed AAC-encoding; enabling him to feel confident in the selections he made whilst minimising interruption to the rate and flow of interaction.

The educational context was a probable factor in the roles of the NS and AS participants. NS participants produced more than twice the number of initiation moves of the AS participants. Use of praise and feedback comments were also employed considerably more by the NS suggesting use of the IRF framework frequently found in teaching interaction (Sinclair and Coulthard, 1975, Hardman, 2008). AS participants played a more respondent role as previously identified in SEND environments (Hardman et al., 2005, Bunning et al., 2013, Bunning and Ellis, 2010). However, the provision of 'inform' moves and active involvement in narrative construction by all AS participants suggests they played a more active role in the interactions, than evidenced in other NS:AS conversational studies (Clarke and Kirton, 2003, Light et al., 1985a, Muller and Soto, 2002). The teaching role of the NS was evident in the use of scaffolding and reflective use of communicative modalities for supporting AS narrative construction. AAC encoding and output was recorded for NS and AS participants, showing NS modelling of AAC use and taking a role as technician. The impact of the device on interaction is discussed further in the following section.

## 6.4 Person and Assistive Technology

The AS participants used different AAC devices, although there were similarities in the usage observed during narrative construction. Speed of access in relation to AAC output is an issue with high-tech devices (Murray and Goldbart, 2009a). One reason for this is the navigation required to identify vocabulary. Despite the variation in software used by the AS participants, all used a page-based system in which vocabulary was categorised on a variety of different dynamic pages. This meant that several successful selections were required in order to construct a phrase or identify the desired vocabulary. The need to make multiple selections to form short utterances further limited the AS' ability to produce narrative, as this is by definition a form of extended discourse (Ninio and Snow, 1996).

The influence of the AAC device is seen in the single word or short utterances used by the AS participants, with no conjunctions employed. This is reminiscent of Soto et al's (2007) single case study where single words and short phrases were mainly used by the participant using AAC in producing a narrative. However, the single word output of children using aided communication is not directly comparable to the single words of speaking children. A far greater number of cognitive processes and resulting device selections have to be completed in order to make a single word output using AAC in contrast to natural speech. The limited length and content of contributions from the AS may account for the high level of co-construction and initiation employed by the NS. All NS participants showed high mean use of query-type moves. As a result, the corresponding AS responses to these were also found to have the highest resulting mean use. This suggests that the NS control of the initiation move-types may restrict the AS to a corresponding response. However, studies of AS conversational interaction also suggest individuals who use AAC produce short utterances lacking in syntactic structure (Beukelman and Mirenda, 2005). It is therefore proposed that both the frequency of NS questions and AS tendency to produce short utterances with limited syntactic content are likely to have influenced the style of interaction observed. This may also be linked to the operational and strategic competencies of the participants, as described by Light (1989). For example, limited AS operational competency may lead to increased NS questioning as a scaffolding strategy, reducing the AAC access and navigation required by the AS. The use of

single words and NS co-construction could be seen as AS strategic competency in constructing narrative whilst limiting the number of AAC-encoding and output moves required. Operational competence is also a factor in how quickly the AS was able to participate in interaction. This is likely to have contributed to both the high frequency of initiations and in particular, question moves from the NS, and the short utterances of the AS. This was most notable for participants relying more on the AAC device than other modalities of communication, for whom a higher-level operational competence was vital as fewer other communicative methods, such as speech or gesture, were available to them.

On a number of occasions across all dyads, NS participants produced different questions in succession. Due to the time taken to produce a response, some AS responses did not follow the NS initiation immediately. This mismatch of NS initiation and AS response was evidenced across the data set. These miscommunications were often due to the NS trying to simplify a question from an open w-question to a choice or yes/no question. The open-ended nature of w-questions makes them more complex for AS participants to provide an appropriate response (Blank, Rose and Berlin, 1978). For Participant S the extended language required to answer a w-question was difficult to produce, as the AAC device was her only modality of language production. However, in all dyads the NS completed simplification before the AS had had enough time to produce a response to the original question. The appropriate w-response was then produced after the second closed question provided by the NS.

The time taken for AAC encoding by the AS produced extended pauses, which were likely factors in communication overlaps. This may have put a strain on co-construction, as found by Light et al. (1985a) who suggested caregivers of NS:AS interaction felt silences were signals of communication breakdown and would therefore re-take the conversation floor after only one to two seconds. During NS:NS conversation communication partners are used to waiting only approximately 0.2 seconds before receiving some form of response (Heldner and Edlund, 2010). In contrast, a study by Higginbotham et al. (2007a) found that the communication rate of an individual using AAC was five to fifteen words per minute in comparison to 150 to 160 words produced per minute in natural speech (Yuan, Liberman and Cieri, 2006). The fact that three of the NS participants had

limited experience working with children who use AAC may have contributed to their need to continue communication during long pauses. This considerable difference in the rate of interaction led to them producing initiation moves when AS participants were still formulating responses. Alternatively, this could also have been a strategy to maintain AS interest and attention, encouraging their output. Similar communication breakdowns occurred in all dyads, even for the NS who had considerable experience of AAC technology. Von Tetzchner and Martinsen (2000) explain that the tenets of natural conversation are altered in NS:AS interaction, for example, waiting longer than the expected 0.2 seconds between turns.

Sentence completion ('query-completion') as a NS-initiated scaffolding strategy was applied to AS responses by providing a complete grammatical frame missing a single content word. AS's were then able to produce narrative output without navigating numerous pages in order to form the phrase themselves. This also allowed the NS to model correct syntactical structures to the AS, which is important as this is an area in which children who use AAC often experience difficulties in contrast to typically developing peers (Beukelman and Mirenda, 2005). Through sentence completion, the AS experienced complete pieces of narrative language from a single AAC output. Choices ('query-choice') offered by the NS provided similar structured scaffolding for co-construction by demarcating an expected response, thereby compensating for the demands of whole sentence encoding with an AAC device. Thus Participant S was able to control the narrative being created but was not expected to identify and formulate all aspects of the language required. Both of these scaffolding techniques facilitated a faster speed of interaction than through independent narrative construction.

The lack of AS control over device vocabulary is recognised as a limitation to AAC use (Murray and Goldbart, 2009b). Programming is a complex task, which is usually the responsibility of a NS partner and this was the case for three of the dyads in the current study, apart from Participant O. The researcher programmed Participant O's device due to the NS's lack of experience. Although the NS participant showed the vocabulary to the AS prior to a data collection session, the participants would not have been entirely familiar with it. This may account for some of the 'check' moves recorded for Participant J. 'Check' questions were often used to confirm with the NS that Participant J could press a vocabulary



symbol on his device. This could also be due to the short length of time he had been using the device.

Although the vocabulary lists included some function words, content words were the main vocabulary items listed (see appendix B14). This may have inhibited AS use of function words, even though a range of function words were available on all participants' AAC devices and similar results regarding function word use were recorded in all cases. Limitations of vocabulary could also be linked to the large amount of query-type moves employed by NS participants. NS participants needed to employ a high frequency of questions to clarify meaning of AS content word productions and enable co-construction of single word utterances into narrative language. The high production of content words by AS participants may have influenced NS use of sentence completion in order to scaffold the AS contributions and provide a model of function word use. This scaffolding strategy was also linked to the NS role as teacher as discussed in section 6.3 above.

For Participant S the high number of page navigations resulted in high instances of 'AAC-encoding' - almost twelve times the number of 'AAC-output'. This phenomenon was also observed for Participant B and Participant J, although the differences between 'encoding' and 'output' were not as large. In contrast, the findings recorded for Participant O showed the same mean 'AAC-encoding' and 'AAC-output' acts across all narrative interactions. This may be attributable to vocabulary layout and page set up on AS interaction. For example, an increased need to navigate through dynamic pages to locate vocabulary would increase 'AAC-encoding' in comparison to 'AAC-output'. Variation in operational competence of the four participants may be a factor, defined as individual knowledge and technical skills (Light, 1989). A high level of operational competence was essential for Participant S in order to navigate between pages and AAC encoding processes. All other participants used speech in order to provide some narrative vocabulary, which may have reduced the requirement to navigate across dynamic pages and lowered the frequency of AAC encoding acts. These participants may have therefore relied more on strategic competence, finding alternatives to AAC use when unsure of the location of vocabulary (Light, 1989).

The level of 'AAC-encoding' by AS participants to produce 'AAC-output' may account for the high frequency of 'eye gaze-device'. For three out of four AS participants and two NS participants, eye gaze towards the device was the most commonly coded eye gaze-type, despite the fact that AAC devices were used infrequently in comparison to other communicative modalities. This highlights the large influence of the device on the interaction. The expected face-to-face eye contact of NS to NS interaction was, in effect, limited by the presence of the AAC device. This meant both participants were engaged in looking at the communication aid, with the NS waiting for an AS contribution.

AAC access method may have also affected the style of interaction. Three participants (B, J and O) used direct access to their AAC device by means of either their hand or a stylus. Participant S used eye gaze with a dwell selection, which was reflected in her high usage of 'eye gaze-device'. In contrast, the second highest use of 'eye gaze-device' was by Participant J, who used about a third of the instances recorded for Participant S. This suggests the eye-gaze access method may have further limited the face-to-face interaction between Participant S and the NS. Participant S was coded as looking at the AAC device for over 50% of the coded instances throughout narrative interactions. Just above 20% of instances were coded with Participant S making eye gaze toward the conversation partner. This may be accounted for by the device being positioned directly in front of Participant S for ease of access; this meant she was required to turn her entire head in order to make eye contact with the NS, which was particularly fatiguing for Participant S. There is little research examining the effect of eye-gaze access on the communicative modalities employed in interaction, and this is an area warranting further investigation.

The physical effort involved in AAC access for Participant S was a major factor in the increased duration of narrative. She had to maintain an upright head position in order for the eye-gaze system to work effectively. This resulted in a number of directive-type moves from the NS to facilitate Participant S achieving a good posture for AAC access. This effort may have led to the use of a number of other communicative modalities for faster input to the interaction, e.g. facial expression or vocalisation. Fatigue may have also been a factor in Participant S's use of linguistic moves. In particular, her 'request for help' initiations tended to occur primarily towards the end of narrative interactions when energies were

lower. Participant B also found AAC access effortful due to his difficulties in accurate selection. A keyguard was used to help with this, however a number of 'mis-hits' occurred. This may have influenced his use of speech as a principal modality of communication over AAC-output.

Sustainability of an AAC device is a factor for consideration where technical faults may interrupt continued usage. For example, two participants experienced technical faults during the data collection period. In fact, a total of eight out of thirty-four (23.5%) data collection sessions were cancelled due to technical issues (appendix D1). This resulted in delays for repair completion. Smaller technical faults also occurred during recording of narrative interactions (e.g. the screen freezing), which led to an increase in the number of directives and explanations produced by the NS. In the circumstance of technical faults occurring, the highest instances of NS 'instruct' and 'explain' moves were recorded, when the NS attempted correction of the fault whilst continuing the interaction. Technical fragility and even failure are likely to affect everyday communication experiences of users (Murray and Goldbart, 2009a). The loss of an AAC device due to technical breakdown may further restrict the already limited opportunities for AS interaction.

Familiarity with the AAC device varied across the participants. At the time of data collection, Participants S and J had been using their devices for approximately four months; Participant O for twelve months; and Participant B for three years. Participant J's lower familiarity with the device was evident in his use of 'check' questions, requesting confirmation before completing AAC-encoding moves. In comparison, other participants did not actively seek cues from the NS. Despite having his device the longest, Participant B produced the lowest mean 'AAC-output' of all participants. His NS had worked with him five days a week for approximately four months at the first data collection session. As a result, she was able to understand a reasonable level of his speech despite his severe dysarthria. Within the familiar school environment where support staff were able to understand Participant B, speech may have been a more economic and efficient mode of communication. Repetition of his speech when misunderstood may have been faster than access on the AAC device. Speed of interaction may affect usage and has been suggested to affect an individual's attitude to the AAC device (Scherer, Sax, Vanbiervliet, Cushman and Scherer, 2005).

The NS working with Participant B used a high frequency of hand gesture, tapping the AAC device, alongside instruction to encourage use of the device. This was also observed in the dyads of Participants J and O, but not with the same frequency. It is possible that the NS perceived B's lack of spontaneity in accessing his device and sought to prompt him. Other NS gesture towards the AAC device was employed with linguistic moves providing explanations or comments. These moves were employed to give explanation of NS AAC-encoding while correcting a technical fault, or to direct the AS during dynamic page navigation. The NS use of AAC-encoding and output alongside feedback comments and explanations suggests some adaptation of communication modality use to support the AS, as described by Bunning et al. (2013).

Participant J was observed to seek support in AAC-encoding from the NS. He was coded asking 'check' questions to gain confirmation, while pointing or indicating a particular button on the AAC device screen, waiting for positive feedback from the NS prior to completion of AAC-encoding. In response, NS participants were also observed pointing to specific buttons on the AAC device to provide non-vocal cues to the AS while requesting information. Although providing significant scaffolding, this still enabled the AS to make the selection and therefore feel that they had produced the correct response. NS use of linguistic moves and communicative modalities aimed towards the AAC device show scaffolding techniques both encouraging and facilitating AS use of the AAC device. This may in turn be linked back to the NS role as both teacher and technician, sharing their increased knowledge of the device, in particular in relation to navigation and vocabulary location.

Overall, it is clear that the presence of the device had a considerable impact on the narrative interaction, leading to co-construction between the AS and NS partnership. Interactional sequences produced by all dyads show traits of AS interaction previously evidenced in existing studies. The reduced speed of interaction led to the NS employing consecutive query-type moves, which resulted in response moves from the AS that did not match. This may be due to the layout of vocabulary causing high frequency of dynamic page navigation on the AAC device but also experience of NS partners in interacting with children who use AAC. It is beyond the scope of this study to identify the exact cause of the

instances of miscommunication. However, similar AAC related issues were observed for all participants under both conditions. The need for differing levels of operational competence were observed between participants employing AAC as an augmentative tool (Participants B, J and O) and Participant S employing AAC as an alternative method of communication. It is suggested that Participants B, J and O relied more on strategic competence (Light, 1989), using alternative methods of communication and communicative strategies to construct narrative when lacking competence in device use. The integrated profile of communicative modality and linguistic move use highlighted the importance of NS scaffolding through modelling of AAC device use and the provision of non-vocal cues. This was found to facilitate the AS to provide narrative information, retaining some control of the interaction. The following section explores the impact of the different narrative conditions (activities) on the narrative construction.

## **6.5 Person and Activities**

One section of the 'activities' attribute identified by Hersh and Johnson (2008) is cognitive activity. This section is broken down into numerous sub-categories including: creative and imaginative thinking, planning and organising, decision making, experiencing and expressing emotions. Cognitive activity is therefore particularly relevant to narrative language as almost all sub-categories are required in its construct (Levin, Schaffer and Snow, 1982). Similarities and differences were observed between the two narrative conditions in the findings of this study.

Linguistic move-types employed under the two conditions showed considerable variation between dyads. Participants B and J were the dyads which showed the largest difference in mean linguistic moves coded between conditions, although Participant B's scores (PN>FN) were the reverse of Participant J's (FN>PN). This was also reflected in the increased length of the narrative constructions under these narrative conditions for Participants B and J and may simply indicate a personal preference for a specific narrative type. Although only two dyads showed considerable difference in the overall mean linguistic moves coded between conditions, a greater level of disparity was shown between specific linguistic move-types within all dyads. For example, Participant S employed considerably more 'reply-Y' moves during PN, which corresponded to

the NS 'query-Y' moves. The differences shown in specific move-types suggest some effect of narrative condition. However, variation in these findings was shown between each interlocutor, indicating considerable individuality in the construction of narratives by users of AAC.

The linguistic move-types showing greatest difference between conditions were paired initiation and response moves between AS and NS. For example, Participant J was asked a substantially higher number of w-questions from the NS under the FN condition than the PN, which led to a higher rate of w-responses from the AS. This pattern of increased NS initiation leading to increased AS response is shown in all dyads, suggesting some form of co-construction in the narrative interaction. The presence of the picture book during FN construction provided a visual scaffold for the structure and storyline to be re-told. A higher cognitive load may have been involved in personal narrative construction as the participant was required to remember the narrative from personal experience and had no visual aid to support this. The two conditions were made as similar as possible by the provision of examples of personal and fictional narratives from the NS at the start of each narrative task. There was considerable variation between dyads regarding all outcome measures under both conditions. It is therefore suggested that the fictional stimuli had limited effect on the linguistic moves and a clearly identifiable impact on specific communicative modalities, i.e. 'environmental reference' and 'eye gaze-other', used by the four participants.

Personal narrative involves the recounting of real past experiences or events pertinent to the individual (McCabe et al., 2008). As a result, the NS participants' prior knowledge of the narrative that the AS was going to tell was limited. It might be expected that AS participants would therefore produce more independent contributions ('inform' moves). However, three of the four AS participants produced lower mean 'inform' moves during PN than FN. The limited prior NS knowledge of AS personal narratives was also expected to increase open questions from the NS ('query-w' moves). Again this was not found in the data recorded from the four participants. Three NS participants showed lower mean 'query-W' moves during PN and considerably higher mean 'query-Y/N' moves. This suggests closed questions were used to elicit personal narrative despite knowledge limitations of the personal story. This may be accounted for by the familiar topics used to elicit PN, enabling the NS to ask closed questions on

predictable aspects of the narrative. For example, during PN about a birthday NS participants often asked closed questions about birthday cake and presents. The increased use of w-questions during fictional narrative was frequently concurrent with hand gesture towards the fictional stimuli as a non-vocal cue. This enabled more open and complex questions to be asked by the NS, facilitated by cueing to simplify the cognitive load for the AS.

Different narrative conditions were found to influence linguistic moves and lead to more complex narratives for each individual AS participant. The variation in the impact of narrative condition on AS productions, may suggest that in order to provide the best opportunity for children who use AAC to develop narrative language, a combination of both PN and FN should be enabled. The current lack of opportunity to produce narrative for children who use AAC is highlighted by Soto et al. (2007) who state this is a larger factor in the narrative language difficulties experienced by children who use AAC than their actual ability to produce narrative.

Individual variation was also shown in the number of words used and length of narrative. No consistency was shown in terms of which narrative-type elicited the longest or higher linguistic complexity from participants. Both Participants S and J showed notably higher mean total words recorded during FN. In contrast Participant O had considerably higher mean total words in the PN condition. These differences may suggest individual preference for narrative-type accounts for some of the variation. For example, the presence of a given plot and characters within the fictional narrative may have facilitated the narrative construction of some participants who benefited from a visual stimulus. However, the personal experience of the events described under the PN condition may have led participants to prefer this type of narrative construction. Further data from participants regarding personal preference of the narrative tasks would be required in order to establish whether this affected the current findings. Considerable individual variation has previously been recognised in the narrative ability of four children using AAC devices across various narrative tasks (Soto and Hartmann, 2006).

Some other observed differences in narrative condition were expected. For example, a notably higher frequency of eye-gaze toward an object was shown

during fictional narrative. This can be attributed to the presence of the fictional stimuli in this condition. This notable difference was observed for both participants in three out of the four dyads.

A difference in communicative modality use, between narrative conditions, was evident in two out of the four dyads. Participant B showed greater mean coded communicative instances during PN and Participant J during the FN condition. Despite the differences observed we cannot suggest that narrative condition affected the overall communicative modality choice. The only exceptions to this were for those modalities affected by the presence of fictional stimuli ('eye gaze-object', 'environmental reference').

When both communicative modality and linguistic moves were examined together, similar patterns were observed. During fictional narrative, 'environmental reference' towards the storybook was frequently coded with NS w-questions and other requests for information. This provided non-vocal cues and context for the question being asked. Similarly, AS participants were found to use 'environmental reference' to the storybook when giving responses to NS questions and when giving narrative information through 'inform' moves. When a stimulus was not available during personal narrative, a small increase in the use of hand and body gesture by NS participants occurred. These gestures again predominantly co-occurred with NS questions and requests for narrative information. This suggests the NS participants may have provided similar non-vocal cues to support the AS under both conditions, but adapted how these were provided dependent on the presence of the storybook. This is particularly evident for Participant B who employed gesture with the NS as part of the narrative construction process under the personal narrative condition, role-playing or miming certain parts of the narrative. No other impact of narrative condition on patterns of linguistic move and communicative modality could be identified. Although data showed an increase in coded instances of 'eye gaze-other' this was employed in conjunction with multiple linguistic move-types for all interlocutors.

Overall, differential influence of narrative condition on participant role appeared to be minimal, with the phenomena discussed above occurring throughout all narrative interactions and conditions. The only exception was the increase in 'environmental reference' during fictional narrative, observed in three



out of the four dyads. The introduction of a fictional stimulus provided a tool for the NS in scaffolding and facilitating AS narrative input. NS participants were observed using 'environmental reference' alongside question moves to prompt AS participants. This links to the co-constructive partnership between interlocutors in narrative interaction. Any disparities observed were inconsistent between dyads. This suggests the heterogeneous nature of individual participants and their narrative preferences may also have impacted on the interaction.

## **6.6 Summary**

This chapter has discussed the findings of the current study in relation to existing literature and within the context of the CAT and MPT frameworks. All research questions have been addressed and summaries of each section are provided below.

### **Person and Context**

The different roles of NS teaching staff and AS students contributed to the narrative construction. NS participants performed the role of initiator, teacher, feedback provider and technician throughout the interactions. They also supported the AS by reflecting their multi-modal communication style and including AAC use in their own communication. The AS tended to fulfil the role of respondent, but was not passive in this role. The educational context appeared to influence narrative construction between interlocutors, as evidenced by the recurring IRF pattern in the interactions. The integrated profile of the narrative interactions showed patterns of co-occurrence were identified for both NS and AS participants' use of communicative modality and linguistic moves. The multi-modal communication observed enabled greater NS use of scaffolding strategies, and AS provision of context to their short responses. This in turn may have reduced possible communication breakdowns.

### **Technology**

The production of single word or short phrase utterances by AS participants on their AAC devices may have increased the NS use of query moves, due to their need to clarify understanding. The presence of the AAC device may also have affected the frequent feedback moves. A high frequency of feedback was given, as the NS gave feedback during parts of the 'AAC-encoding'

process as well as when communicative output was produced. Interaction speed was greatly impacted by the use of the AAC device. This was especially pertinent for Participant S who had limited access to communicative modalities due to her physical disabilities, in contrast to other participants who had greater access to physical gesture and speech for communication. Limited function word use was observed in all participants, reflecting past research that has highlighted reduced syntactic structure and phrase use in children who use AAC.

### Activities

No notable differences were observed between narrative conditions for all outcome measures. However, individual variation was observed between the dyads. Two participants recorded considerable differences in mean communicative acts between the conditions, but produced the highest mean in opposite narrative types. It was suggested that individual preference for one narrative type may have impacted on narrative length and resulting mean communicative acts. However, it is beyond the scope of the current study to provide detailed evidence of this. The AS participants produced narrative content that was attributable to different stages of Applebee's developmental levels (Applebee, 1978), and did not accurately fit one specific developmental stage.

## 6.7 Limitations

It was originally planned to recruit six participants; however, despite a multi-faceted recruitment campaign (e.g. using existing specialist contacts, poster campaign and advertisement through relevant organisations and online forums), the final sample comprised four participants. Due to the small number, a single case series design was the logical option. There was considerable variation between participants, further limiting any between-participant comparisons. Two predominant aetiologies were present amongst AS participants: Cerebral Palsy and ASC type presentation. Although this enabled some identification of potential differences between narrative interactions across aetiologies, this could not be fully explored due to the limited number of participants. AS participants had been using their AAC devices for varying amounts of time, which may also have affected findings. Two participants had only been using their devices for four months, which is likely to have impacted on their confidence in employing the

AAC during complex language construction such as narrative. Further investigation is required examining the effect of experience with an AAC device on resulting interactions before any suggestion can be made on how this impacted the current findings. NS partners also had varying experience with high-tech AAC. The small scale, single case series design and variability of participants means that the findings cannot be generalised to the wider population of people who use AAC; however, they serve to illustrate how narrative interaction occurs between AS students and NS teaching staff and form one of the larger existing studies of NS:AS narrative interaction. The small number of participants also meant it was not viable to complete any inferential statistics on the quantitative data collected. It is therefore not possible to establish the statistical significance of any of the differences observed between participants or conditions. This information would have enabled the researcher to establish a more specific evaluation of the impact of NS and AS role and narrative condition on the interaction.

The methodology employed was tested through a series of pilots. These pilots were used to develop the communicative modality and linguistic move-type coding structures as well as examining the data collection procedure. Poor results from reliability testing during pilot studies led to the coding structures being evaluated and expanded. Increased detail was also included in the definitions of codes. However, within the full study, reliability testing still produced only 'good' results for communicative modality and 'fair' reliability for the coding of linguistic move-type. Increased training sessions with the second coder and further development of the rules for coding improved the reliability of coding communicative modality. The reduction of codes within this structure to provide fewer broad codes, such as 'facial & body gesture' may further improve reliability. Eye gaze was divided into three categories, which produced the highest amount of coder disagreement. However, it is felt that simplification of this code would limit data collection of important information, as eye gaze was shown to be a substantial component of AS and NS interaction. The discrepancies relating to coding of eye-gaze may also be attributed to the tiny movements and small size of the eyes, making precise recording of direction of gaze very difficult. In contrast, it is felt the 'fair' reliability of linguistic move-type coding could be improved by reducing this coding framework. Despite increasing the definitions of codes, the large number of move-types (some of which showed similar properties) is thought

to account for the majority of coder disagreements. In particular, the inclusion of the numerous response moves 'acknowledge', 'object', 'comment' and 'summarise' meant feedback from the NS could be difficult to categorise.

The pilot study identified some data collection procedure issues prior to the main study. For example, issues with camera angles and the NS' difficulty remembering the structure of the session. This resulted in adaptations to the procedure that produced successful data collection during the full study. The pilot data collection session was held with a single participant with cerebral palsy. During the full study the participants who had ASC type disorders completed linguistic moves that were a characteristic of their condition, a factor that had not been identified during the pilot study. This led to further development of the linguistic move-type coding structure during the analysis phase of the full study. If the study were repeated, pilot data would be collected from more than one participant, in order to control for substantial differences present in fundamental demographics such as participant aetiology.

The use of two narrative conditions provided a greater depth of data on narrative interaction in NS:AS dyads. However, the presence of a stimulus during fictional narrative interaction impacted on some of the findings regarding the communicative modalities employed. Increases were shown in frequency of 'eye gaze-other' and 'environmental reference', which can be attributed to the presence of the storybook. Creating a fictional narrative without a stimulus would, however, demand a higher cognitive load including use of imagination. This disparity between conditions was considered during all interpretation of the findings, and therefore limitations imposed by the narrative stimulus were controlled as far as possible. Pictorial references could have been employed during personal narrative to introduce a visual stimulus under both narrative conditions, which may have reduced the effect on findings further.

The preparation of the AAC devices by NS participants and the researcher prior to data collection may also have limited the authenticity of the interactions. AS participants had very limited experience of the vocabulary prior to narrative interactions. This may have had a resultant effect on some of the behaviours observed, e.g. 'check' behaviours by Participant J. Allowing participants to complete a test narrative or carry out specific vocabulary-based activities prior to

data collection would have enabled them to become more confident in locating narrative vocabulary.

All outcome measures addressed the research questions, providing in-depth description of the narrative interactions recorded. The use of MTS as a method of coding communicative modality proved to be efficient and the reliability study completed on this methodology found it to be effective in capturing the data (Chapter Four p.108). Reliability issues which occurred in communicative modality coding were attributed to codes within the framework and not the MTS methodology. However, one limitation of this measure was the combination of facial and body gesture within one code. It was felt that facial expression was an important modality of communication, in particular for Participant S who had the most severe motor difficulties. As this was not quantified, it was not possible to identify the role played by facial expression within the interaction.

The coding of linguistic moves provided in-depth findings of the moves made by each interlocutor and enabled the identification of the roles played within the dyads. As previously identified, this level of detail may have limited the reliability of the framework and therefore this could be simplified for future use. TTR was the measure included in the study that showed the greatest limitations in the provision of accurate results. TTR was included as an outcome measure in order to enable norm comparisons of AS linguistic complexity. However, due to the small size of narrative language samples, which did not meet the most recent recommendations made by Perkins (1994), the TTR calculations were likely to be inaccurate. For this reason, TTR calculated were largely discounted from the discussion of results. The calculation of tokens and types in order to produce TTR did however provide some information on the linguistic complexity of narratives produced. This data also provided greater depth to the examination of the impact of narrative condition on interactions. A higher number of narrative interactions in order to produce a larger language sample would be suggested if TTR were to be used in future research.

Sequential analysis of linguistic moves was initially employed to examine the co-constructive roles of NS and AS interlocutors. However, the large number of codes within the coding structure impacted on the ability to identify any patterns of linguistic move use, as too many two and three part sequences were possible.

The large number of codes also meant matrices became very large and so had to be partially dealt with in quadrants. As a result, interpreting the three event sequence data was very difficult and had to be repeated. This still did not provide transparent results and so this analysis was removed from the study. The re-reading and identification of combined use of linguistic move-types and specific communicative modalities was employed as an alternative. This provided a more accurate picture of the interaction, and by taking this more qualitative approach, the data presented represents the findings more effectively. In future study, the inclusion of sequential analysis may provide important evidence of the patterns of interaction employed between interlocutors. However, simplification of the linguistic move-type coding structure would be needed to improve the efficacy of the sequential analysis.

The limitations identified during the completion of this study have highlighted some areas that may be improved in future research to increase the validity and generalisation of findings. Despite this, the findings have produced evidence of a number of phenomena within narrative interaction between NS teaching staff and AS students that may have implications within a number of fields. These are explored in the section below.

## **6.8 Implications**

The implications of this study are addressed according to the CAT framework (Hersh and Johnson, 2008); those affecting the individual who uses AAC and conversation partners, their participation in narrative interaction, the educational context and the AAC technology.

### **6.8.1 Person and Assistive Technology**

Development of AAC technology is highly dynamic and often focused on improving technical specifications (Higginbotham et al., 2007b). Currently, AAC technical development greatly outstrips the research to support it (Higginbotham et al., 2007b). The findings of the current study highlighted several factors of AAC use that were associated with narrative construction. These provide some evidence for further development of AAC hardware and software. However,

further research of varied interaction types is needed to ensure device advancement is evidence based.

The slow speed of interaction caused by AAC encoding and page navigation was found to have a negative impact on narrative construction. Three out of four participants efficiently employed direct access in order to use AAC devices, but page navigation and layout of vocabulary still led to a slow interaction speed. The considerably longer interactions of participant S also highlight the substantial effect of AAC device access on the speed of interaction. This has implications for both software development and SLTs, who are often responsible for the page layout of devices. It is suggested that all types of interaction should be considered in the programming of a device (Stuart, 2000). During vocabulary programming, emphasis is often placed on conversational and educational interaction. However, due to the potential facilitation of narrative on social and language development, it is suggested vocabulary should be available to enable the sharing of both personal and fictional narrative. This in turn may impact positively on the previously reported limited narrative opportunities of children who use AAC (Soto et al., 2007).

During the current study, vocabulary was independently programmed by NS participants and the researcher. As a result, AS individuals had limited knowledge of the vocabulary on their AAC devices for narrative construction. This may have increased the need for NS support and resulting narrative co-construction, thus having further implications for AAC device programming. The AS should be involved in programming as much as possible, and vocabulary should be negotiated to ensure relevant words are available. This would guarantee personalised vocabulary was entered onto the device, ensuring personal and relevant interaction could be more easily accessed by the child using AAC. Input in programming may also increase the AS's awareness of vocabulary locations improving speed of access and confidence in device use.

Increased interaction speed could in turn facilitate a more natural interaction, with NS participants feeling less need to fill long pauses with increased questions and directive moves. AS interaction and language development cannot be improved solely through technological development. The narrative experience of children who use AAC and the facilitative support of NS

conversation partners are also considerable factors in the interaction. These factors are therefore discussed in the following sections.

### **6.8.2 Person and Activities**

Overall, narrative condition (PN and FN) showed a limited impact on the narrative interactions of participants. However, the findings of the current study highlighted a number of phenomena within AS narrative construction that has implications for the use of narrative with these students.

The interactions recorded identified that narrative was co-constructed between interlocutors. NS participants structured AS moves by employing the IRF framework of interaction. Narrative was therefore broken up and co-constructed as opposed to the extended form of discourse defined by Ninio and Snow (1996). As a result, it cannot be expected that AS narrative interaction will follow the typical tenets of oral narration. This resonates with existing knowledge that AS conversational interaction also does not follow the expected interactional pattern of NS:NS conversation (Von Tetzchner and Martinsen, 2000) which has a number of implications for AS narrative development and interaction.

Due to the structural process whereby the NS prompted responses from the child using a communication device, e.g. through yes/no questions, there may be restricted opportunities to develop story grammar, or to establish the temporal and causal links that form narrative language. The slow process of forming extended discourse on an AAC device means this may be an unrealistic expectation for children who are developing language using AAC. The NS must therefore establish a balance, between co-construction and scaffolding in order to facilitate access to narrative, without restricting experience by constructing all story grammar for the AS. The production of extended narrative discourse using an AAC device is considerably more time consuming and inefficient than oral narrative. Narrative activities may, therefore, benefit from the use of sentence completion or choice as these were found to be the most successful modes of scaffolding AS input into story grammar. Further research is required into the narrative development of children who use AAC in order to establish the most effective way in which it can be facilitated.



Despite limited experience, all AS participants demonstrated the ability to co-construct personal and fictional narrative. However, it is suggested that personal AS preference for one narrative type may have influenced the interactions. Both fictional and personal narrative can facilitate different aspects of language development. Children who use AAC should therefore have the opportunities to experience both PN and FN construction (Soto et al., 2009). Personal narrative is acknowledged as a vital component in the sharing of experience and resulting social inclusion (Snow, 1983). The sharing of personal experience has also been recognised to have a positive influence on social and emotional development (McCabe et al., 2008). Despite co-construction with the NS, shared experience was demonstrated in a number of AS personal narratives, suggesting that although narratives were heavily scaffolded, the AS experienced similar aspects of personal narrative to their TD peers. This has positive implications for AS development, as it may suggest that children who use AAC experience similar opportunities for social development through shared experience as their TD peers.

Tenets of narrative interaction were altered by the employment of an AAC device. This not only has implications for the development and participation in narrative construction for the AS but also has consequences on the AS access to social and environmental context. This is discussed in the following section.

### **6.8.3 Person and Context**

The linguistic moves made throughout the current study showed an extension of the well recognised IRF pattern of educational interaction (Sinclair and Coulthard, 1975). This use of scaffolding in co-construction with children who use AAC is inevitable and also vital in facilitating the early development of complex language structures such as narrative (Grove, 2006). The co-construction of narrative has considerable implications for the academic attainment of children who use AAC. At P Level 7 students are expected to produce phrases of up to three key words in order to tell stories (Qualifications and Curriculum Authority, 2007). Currently, at key stage 1, students are expected to tell real and imagined stories through extended discourse (QCDA, 1999). Due to the short utterances and single word output heavily scaffolded by the NS, a child who uses AAC would be unlikely to attain either of these academic levels if

narrative followed the patterns of interaction observed within the current study. Under the new English National Curriculum attainment levels related to narrative language and 'speaking and listening' are reduced. However, there remains no acknowledgement of AAC as a method of 'spoken language' and no mention of scaffolding practices within teaching. As a result, it is suggested that barriers to the 'spoken language' aspects of the English National Curriculum may therefore still be present for children who use AAC. Despite NS scaffolding, the personal narratives produced still contained information particular to the AS participants. Co-construction may therefore need to be considered as a way for children who use AAC to attain these levels of academic achievement.

Within the educational context of the child who uses AAC, speech and language therapy has a considerable input. The storybook stimuli used within this study were well known speech and language therapy assessment materials. All participants were able to produce a narrative relevant to the stimuli and gained enjoyment from these tasks. This has positive implications for the use of these assessments with children who use AAC. It is suggested that narrative may be a useful informal assessment tool. By recording and observing narrative production between a child who uses AAC and their most frequent education support assistant, the SLT may gain valuable insight into the child's ability to produce extended discourse, as well as identifying the existing co-construction and scaffolding strategies employed by the NS. Although no norms would be available for comparison of narratives produced using these assessments, repeated narrative samples could also enable a good overview of the individual's developing linguistic ability.

The way in which personal narrative was co-constructed in the current study may also have implications within the context of social development for children who use AAC. Shared experience is a known facilitator of social relationships and an important aspect of social development (Grove, 2005). Co-construction was needed in order to enable AS participants to share personal experience. This may therefore lead to restricted opportunity to participate in social interaction if a familiar NS is not present to facilitate personal narrative, further limiting progress towards independence. It is therefore suggested that the opportunity to develop personal narrative, through increased opportunity and NS

support, may be important in facilitating social development for children who use AAC.

The milieu or context surrounding the individual who uses AAC influences not only the success of the AAC device use but also the provision of opportunity. The milieu can therefore heavily impact on the language learning experiences of children who use AAC and must be as much of a focus for intervention and support as the child.

#### **6.8.4 Summary**

Implications have been identified in multiple aspects of the context, activities and technology experienced by an AS when constructing narratives. Teaching staff were found to dominate initiation and feed back moves, and require support in order to facilitate AS narrative by leading co-construction, but not dominating the interaction. Acknowledgement of the multiple methods of communication employed by an AS also seems essential for successful and efficient narrative construction. Both personal and fictional narrative opportunity needs to be available to the AS in order to facilitate different aspects of language and social development, and to appeal to different personal preferences. Finally, technology needs to be developed appropriately to support specific types of language such as narrative, as well as improved efficiency in access and navigation of software to support its use.

#### **6.9 Future research**

The findings of the current study have led to the identification of several specific areas for further research. In terms of the research population, two different developmental disorders were present within the current study. This led to the identification of some aspects of interaction that may have been affected by the primary diagnosis of participants. For example, 'repetitions' and 'overuse of the device' were only recorded during the narrative interactions of Participants J and O who both had ASC type developmental disorders. It is therefore suggested that future research incorporates a more homogenous group of AS participants defined by primary developmental condition and age and if possible with a balanced representation of gender. This would enable research to identify the

more specific characteristics of AAC use for different user groups, which in turn could facilitate the most effective methods of support. A more homogenous participant group, or a sample that at least share primary diagnoses, age and device experience could also increase the external validity of future findings.

In contrast to other existing narrative studies, the input of the NS was analysed using the same measures as the AS. This enabled the address of RQ1, providing detail of the NS role within narrative interaction. However, this still remains an under-researched area and further extension of these findings could be beneficial. Narrative interactions captured in the current study were completed with teaching staff, but outside of the true educational environment of the classroom. Research investigating narrative interaction within classroom discourse between NS teaching staff and AS students would provide a more realistic observation of narrative construction within the educational context. When examined alongside the findings of the current study looking at dyadic interactions, an accurate picture of the narrative interaction of children who use AAC could be formed. In turn, this could provide an important evidence for developing teaching practise and AAC technology.

Inclusion of the NS opinion on recorded interactions would provide access to their insight into the role they play in narrative co-construction with AS students. The importance of the conversation partner in AS interaction has been highlighted by a number of authors (Murphy et al., 1996, Ronski et al., 2005). NS interlocutors' attitude to the AAC device has also been identified to impact on interaction (Scherer, 1993, Hersh and Johnson, 2008). No information on attitudes to AAC was collected during the current study. Specific data regarding NS attitude to AAC and their view on the success of interactions in terms of the NS role, AS facilitation and overall narrative constructed could provide a greater level of detail to our current understanding of the NS role in interaction. Completing NS interviews directly following research interactions and consequently following review of video data is suggested as a methodology to provide data within these areas.

The asymmetry of dyadic interactions recorded during the current study also identifies an area for further research within SLT intervention. Although this is the field within which most AS narrative studies have been completed, it is still

relatively under-researched. Research is needed to explore how SLT intervention could be designed to affect a more balanced interaction between NS and AS. Liboiron and Soto (2006) identified the scaffolding practises of an experienced SLT who facilitated active narrative contributions from a single participant who used AAC during shared storybook reading. However, this was only a single case, in which the child using AAC was familiar with the storybook being read. It is recommended that further research is needed to establish the most effective scaffolding approaches to facilitate active participation in narrative interaction from children who use AAC. Restricted opportunity to access narrative has also been identified as a limitation to the narrative skills of children who use AAC (Waller et al., 2001). This may be improved by placing narrative at the centre of an intervention programme, emphasising its importance for development of both language and social skills.

# Chapter Seven

## Summary and Conclusions

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This chapter summarises the current study and provides an overview of previous chapters. Concluding remarks are presented regarding the educational, technological and clinical applications of the findings.

### 7.1 Summary of Study

The study identified factors salient to the use of AAC through Scherer's (1993) MPT model and Hersh and Johnson's (2008) CAT model. A description of the 'technology' and 'milieu', or wider context, aspects from the model were provided. The considerable variation in the aetiology of individuals who use AAC was raised and the most recent prevalence data for AAC use within the UK was presented. Consideration of the wider context of government legislation introduced the seminal pieces of legislation such as the Bercow Report (Bercow, 2008), which highlighted the barriers to the National Curriculum experienced by children with communication difficulties. The existing English National Curriculum and P Levels were found to include several criteria relating to the construction of narrative and storytelling. The IRF framework (Sinclair and Coulthard, 1975) was identified as the most commonly occurring pattern of interaction in both mainstream and SEND education settings. However, it was recognised that within the SEND classroom, further research examining the interactions between teachers and students with communication difficulties was needed.

The literature review made reference to existing theories of language acquisition, identifying the importance of both the individual and their environment within the process. The resulting complexity of language development for children with developmental disorders and communication difficulties was discussed. This highlighted the differences experienced by these children in contrast to TD children in terms of interaction and exploration of the environment. Children who use AAC were recognised to take a respondent role in conversational interactions

that were dominated by NS partner initiations. This led to the structured review of nine papers, identified through keyword searching of relevant databases. These papers examined the narrative interactions of children who use AAC. The predominant themes of intervention for narrative skills and story-telling interaction between parents and their children who used AAC were identified. In order to provide original data within the gaps in this field the previously under-researched area of AS narrative interaction within an educational context formed the basis of the current study. As a result, the research questions were constructed, provided here as an aide memoire:

How is narrative constructed within a teacher (natural speaker) - pupil (aided speaker) dyad under the conditions of: a) personal narrative and b) fictional narrative?

RQ 1. What characterises the communicative roles occupied by teacher (natural speaker) and student (aided speaker) in the construction of narrative?

RQ 2. How does narrative condition affect the contributions teacher (natural speaker) and student (aided speaker)?

RQ 3. How do communicative modality and linguistic move-type correspond in the narrative interaction?

Chapter Three presented the methodology for the study. The study design and rationale were discussed. Recruitment strategies and the resulting participant demographics were provided and all ethical considerations of the study were detailed. Data collection procedure was piloted in order to take full consideration of issues such as camera reactivity. Resulting adaptations to the process were identified and the final full procedure was presented in order to ensure replicability of the study. Development of coding structures for the measurement of both communicative modality and linguistic move-types was described in detail, including the address of initial reliability issues. Finally, measurement of linguistic complexity was introduced as a further method of analysing the recorded interactions.

Due to the novel use of MTS as a sampling strategy within the current study, a reliability study was completed to examine the suitability of its use with

interaction data. A small scale replication of the Brulle and Repp (1984) study was completed, testing the reliability of coding intervals ranging from ten to one hundred and twenty seconds. Intervals over thirty seconds were found to include some inaccuracies, with low frequency communicative modalities being omitted. Intervals of ten and twenty seconds were found to provide an efficient and reliable structure for coding interaction data. As a result, ten second MTS intervals were employed during analysis of communicative modalities within the current study.

The fifth chapter provided an overview of the data analysis processes employed before presenting the findings of the study for each participant. Findings were given within the context of each research question. Excerpts of transcript were provided to further evidence phenomena identified within the data. Findings were then summarised, identifying salient features of the data both between and within subjects.

Finally, in the preceding discussion chapter the findings were discussed in detail in relation to a combined model of the CAT (Hersh and Johnson, 2008) and MPT (Scherer, 1993) frameworks (figure 6.1a p.200). This model provided the attributes of person, assistive technology, activities and context as the salient factors for consideration in relation to the narrative interactions of children who use AAC. The presence of an AAC device was associated with the communicative modalities and linguistic move-types employed. All participants employed multi-modal communication, with NS participants reflecting the AS modality use in order to scaffold communication. Narrative condition showed limited affect on the interactions, although some individual variation was found between participants. Under both conditions, narrative was found to be co-constructed by all dyads, showing a partnership between NS and AS in order to complete the research tasks. The NS participants all produced substantially more initiation and feedback moves than the AS participants, who produced higher numbers of response moves. This indicated the influence of the educational context, with the use of the IRF framework of interaction by NS participants.

## **7.2 Conclusions**

The findings of this study serve to illustrate phenomena within AS:NS narrative interaction. The small scale of the study means the research outcomes



cannot be representative. However, they provide an in-depth description of the co-constructive process of narrative production between AS and NS interlocutors, which can be used to inform a number of areas. For example, these findings have been closely linked to all areas of the MPT (Scherer, 1993) and CAT (Hersh and Johnson, 2008) frameworks: person, assistive technology, activities and context/milieu. The conclusions are therefore structured using these headings.

### Person

Users of AAC are a non-homogenous group. Aetiological variation between participants led to some differences in co-construction of narrative, suggesting that personal attributes must be considered in order to best support a child who uses AAC. This was recognised by NS participants who reflected AS multimodal communication and also used the AAC device to facilitate the interaction. The individual who uses AAC was found to be central to all other factors that affect interaction. They must therefore remain at the centre of all teaching, intervention and development of technology.

### Person and Assistive Technology

The use of AAC during the study had a substantial effect on the narrative interactions recorded. AAC devices were employed as one part of a multi-faceted approach to communication. Although employed to produce narrative information it was not a sole means for message construction, and was used in conjunction with multiple other communicative modalities in order to convey the message. Use of assistive technology must be considered as a part of multi-modal communication employed by individuals with communication difficulties and not an isolated communication method.

### Person and Activities

The current study has shown that the narrative activity and the materials used to support elicitation are factors of influence on the interaction. The communicative processes and the purpose of the interaction have also been shown to impact on the discourse and communicative acts of the interlocutors. The individuality of each participant's responses towards the different conditions observed highlights the importance of maintaining the person centred focus within any task or interaction.

## Person and Context

The educational context and role of the NS participants as teaching staff had some influence on the occurrence of the IRF framework during all interactions. Co-construction through the AS:NS dyadic interaction was found to remove the traditional extended discourse style of narrative. Scaffolding was observed within all dyads and highlighted the NS role as teaching staff. Scaffolding employed was found to be facilitative in eliciting narrative from participants, but also may have also been restrictive, putting the NS in the dominant 'teaching' role. Further research examining narrative interaction within the classroom is needed. This may establish whether the class environment reduces the level of co-construction in contrast to the dyadic interactions of the current study.

In conclusion, the individual who uses AAC must be central to the ongoing advancement of AAC technology. Emphasis must be placed on the provision of an evidence base of studies examining the various interaction types experienced by people who use AAC. This will inform clinical intervention, technological development and teaching practice. In this era of 'inclusion' and technological development, children who use AAC must have access to all types of language to enable the true removal of barriers to their academic and social development and ensure they attain their full potential.

“Great stories happen to those who can tell them.”

– Ira Glass

## Appendix A1

### Existing National Curriculum Key Stage 1 English: Speaking and Listening and New National Curriculum Spoken Language Criteria

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In English, during Key Stage 1 pupils learn to speak confidently and listen to what others have to say. They begin to read and write independently and with enthusiasm. They use language to explore their own experiences and imaginary worlds.

Speaking and listening: during Key Stage 1 pupils learn to speak clearly, thinking about the needs of their listeners. They work in small groups and as a class, joining in discussions and making relevant points. They also learn how to listen carefully to what other people are saying, so that they can remember the main points. They learn to use language in imaginative ways and express their ideas and feelings when working in role and in drama activities.

Building on the early learning goals

Pupils' prior experience of speaking and listening includes

- using language to imagine and recreate roles and experiences
- attentive listening and response
- interacting with others in play and to get things done.

Knowledge, skills and understanding

#### **Speaking**

1. To speak clearly, fluently and confidently to different people, pupils should be taught to:
  - a. speak with clear diction and appropriate intonation
  - b. choose words with precision
  - c. organise what they say
  - d. focus on the main point(s)
  - e. include relevant detail
  - f. take into account the needs of their listeners.

#### **Listening**

2. To listen, understand and respond to others, pupils should be taught to:
  - a. sustain concentration
  - b. remember specific points that interest them
  - c. make relevant comments
  - d. listen to others' reactions
  - e. ask questions to clarify their understanding
  - f. identify and respond to sound patterns in language [for example, alliteration, rhyme, word play].

### **Group discussion and interaction**

3. To join in as members of a group, pupils should be taught to:
- take turns in speaking
  - relate their contributions to what has gone on before
  - take different views into account
  - extend their ideas in the light of discussion
  - give reasons for opinions and actions.

### **Drama**

4. To participate in a range of drama activities, pupils should be taught to:
- use language and actions to explore and convey situations, characters and emotions
  - create and sustain roles individually and when working with others
  - comment constructively on drama they have watched or in which they have taken part.

### **Standard English**

5. Pupils should be introduced to some of the main features of spoken standard English and be taught to use them.

### **Language variation**

6. Pupils should be taught about how speech varies:
- in different circumstances [for example, to reflect on how their speech changes in more formal situations]
  - to take account of different listeners [for example, adapting what they say when speaking to people they do not know].

### **Breadth of study**

7. During the key stage, pupils should be taught the knowledge, skills and understanding through the following range of activities, contexts and purposes.

### **Speaking**

8. The range should include:
- telling stories, real and imagined
  - reading aloud and reciting
  - describing events and experiences
  - speaking to different people, including friends, the class, teachers and other adults.

### **Listening**

9. The range should include opportunities for pupils to listen to:
- each other
  - adults giving detailed explanations and presentations [for example, describing how a model works, reading aloud]
  - recordings [for example, radio, television].

### **Group discussion and interaction**

10. The range of purposes should include:
- making plans and investigating

- b. sharing ideas and experiences
- c. commenting and reporting.

### **Drama activities**

11. The range should include:

- a. working in role
- b. presenting drama and stories to others [for example, telling a story through tableaux or using a narrator]
- c. responding to performances.

(QCDA, 1999)

### **Spoken Language – Years 1 to 6 – October 2013 Statutory Requirements**

Pupils should be taught to:

- listen and respond appropriately to adults and their peers
- ask relevant questions to extend their understanding and knowledge
- use relevant strategies to build their vocabulary
- articulate and justify answers, arguments and opinions
- give well-structured descriptions, explanations and narratives for different purposes, including for expressing feelings
- maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments
- use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas
- speak audibly and fluently with an increasing command of Standard English
- participate in discussions, presentations, performances, role play, improvisations and debates
- gain, maintain and monitor the interest of the listener(s)
- consider and evaluate different viewpoints, attending to and building on the contributions of others
- select and use appropriate registers for effective communication.

Notes and guidance (non-statutory)

These statements apply to all years. The content should be taught at a level appropriate to the age of the pupils. Pupils should build on the oral language skills that have been taught in preceding years. Pupils should be taught to develop their competence in spoken language and listening to enhance the effectiveness with which they are able to communicate across a range of contexts and to a range of audiences. They should therefore have opportunities to work in groups of different sizes – in pairs, small groups, large groups and as a whole class. Pupils should understand how to take turns and when and how to participate constructively in conversations and debates.

Attention should also be paid to increasing pupils' vocabulary, ranging from describing their immediate world and feelings to developing a broader, deeper and richer vocabulary to discuss abstract concepts and a wider range of topics, and to enhancing their knowledge about language as a whole. Pupils should receive constructive feedback on their spoken language and listening, not only to improve their knowledge and skills but also to establish secure foundations for effective spoken language in their studies at primary school, helping them to achieve in secondary education and beyond.

(DfE, 2013)

## Appendix A2

### P Scales English: Speaking and Listening – P5 –P8

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#### **P Scales: English – Speaking P5 – P8**

##### **P5**

Pupils combine two key ideas or concepts. They combine single words, signs or symbols to communicate meaning to a range of listeners, for example, 'Mummy gone' or 'more drink'. They make attempts to repair misunderstandings without changing the words used, for example, by repeating a word with a different intonation or facial expression. Pupils use a vocabulary of over 50 words.

##### **P6**

Pupils initiate and maintain short conversations using their preferred medium of communication. They ask simple questions to obtain information, for example, 'Where's cat?'. They can use prepositions, such as 'in' or 'on', and pronouns, such as 'my' or 'it', correctly.

##### **P7**

Pupils use phrases with up to three key words, signs or symbols to communicate simple ideas, events or stories to others, for example, 'I want big chocolate muffin'. They use regular plurals correctly. They communicate ideas about present, past and future events and experiences, using simple phrases and statements, for example, 'We going cinema on Friday'. They contribute appropriately one-to-one and in small group discussions and role play. They use the conjunction and to link ideas or add new information beyond what is asked.

##### **P8**

They link up to four key words, signs or symbols in communicating about their own experiences or in telling familiar stories, both in groups and one-to-one, for example, 'The hairy giant shouted at Finn'. They use an extensive vocabulary to convey meaning to the listener. They can use possessives, for example, 'Johnny's coat'. They take part in role play with confidence. They use conjunctions that suggest cause for example, 'cos,' to link ideas.

#### **P Scales: English – Listening P5 – P8**

##### **P5**

Pupils respond appropriately to questions about familiar or immediate events or experiences for example, 'Where is the ball?', 'What are you doing?', 'Is it yellow?'. They follow requests and instructions containing at least two key words, signs or symbols, for example, 'Put the spoon in the dish', 'Give the book to Johnny'.

##### **P6**

Pupils respond to others in group situations, for example, taking turns appropriately in a game such as 'Pass the parcel'. They follow requests and instructions with three key words, signs or symbols, for example, 'Give me the little red book'.

##### **P7**

Pupils listen, attend to and follow stories for short stretches of time. They follow requests and instructions with four key words, signs or symbols, for example, 'Get the big book about dinosaurs from the library'. They attend to, and respond to, questions from adults and their peers about experiences, events and stories, for example, 'Where has the boy gone?'.

**P8**

Pupils take part in role play with confidence. Pupils listen attentively. They respond appropriately to questions about why or how, for example 'Why does a bird make a nest?', 'How do we copy this picture?'.

(QCDA, 2007)



## Appendix B1



### The 'Telling Stories' Project: Information Sheet for Parents/Carers

#### Why is story-telling important?

Stories are very important for a child's development. However, children who use communication aids do not always have the same opportunities to develop their story-telling as other children. Whether it's telling their parents what happened at school or sharing something about their favourite story book, all children need to be able to share experiences through story-telling.

You are being asked about your child taking part in this research project which is called 'Telling Stories'. To find out more about the 'Telling Stories' project please read the information below.

#### Who is carrying out the project?

- This project is being carried out by Pippa Bailey who is a PhD student at the University of East Anglia
- Pippa's work is being supervised by Karen Bunning a Speech and Language therapist at the University of East Anglia
- The 'Telling Stories' project has been approved by an ethics committee at the University of East Anglia

#### What is the project about?

- The project is about the abilities of children to tell stories with a communication aid and the support of their teachers
- We also want to see how the ability to tell stories changes over 6 months.

#### How can my child take part in the project?

- If your child uses a communication aid, they can take part and we would like to hear from you.

#### What would my child have to do?

- We would visit your child at school to carry out story-telling sessions along with their teacher or teaching assistant.
- We will take your child out of the classroom for no longer than an hour for a one-to-one session with their teacher.
- There will be 2 activities in each of the sessions: 1) general conversation 2) story-telling tasks
- We will record your child's stories with a video and audio recorder.
- We would like to visit your child 4 times. We would visit twice, followed by a three month gap and then another two visits.





- Once collected we will analyse all of the video recordings to see how story-telling happens between the child and their teacher or teaching assistant.
- If at any point you are unhappy with the way the research is being done you can make a complaint to the University of East Anglia

**What are the risks and benefits of taking part?**

- In our experience most children enjoy taking part in projects and having the opportunity of a one-to-one special session
- Some children may have some discomfort initially with the use of a video camera.

**Do I have to agree to my child taking part in this project?**

- No, participation in the study is entirely voluntary, and therefore it is entirely your choice whether you decide to give consent or not.
- Your rights and your child's rights will not be affected by your decision
- Even if you do give consent you can change your mind at any time, and you do not need to give a reason.
- If you choose to withdraw your child any data that has been provided will be destroyed.
- Withdrawal from the study will have no affect on your status as primary carer/employment, and will not affect your legal rights.

**What about the privacy of my child?**

- We will not use your child's name in any part of the project
- All material will be kept in a secure place, and only Pippa and her supervisor will be able to see it.
- All recordings will be kept for a maximum of 5 years and then destroyed.


**What will happen at the end of the project?**

- Each child will receive a DVD of their work on the 'Telling Stories' project with an individual report to go with it.
- We will put on a workshop about story-telling with children who use communication aids, which will be for parents, carers, teachers, other workers and all of the children who have taken part in the study.
- The project will be written up so that professionals working with children who use communication aids can benefit from what we find out.



**Contact Information**

- If you are interested in your child taking part in the project please complete the consent form attached and return it in the stamped addressed envelope provided.

<p>Pippa Bailey Postgraduate Research Student in Speech and Language Therapy <a href="mailto:P.Bailey@uea.ac.uk">P.Bailey@uea.ac.uk</a></p>	<p> 01603 593300  At: School of Allied Health Professions, University of East Anglia, Norwich, Norfolk, NR4 7TJ.</p>
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## Appendix B2



### Teaching Staff Information Sheet 'Telling Stories' Project

You are being invited to take part in a research study called 'Telling Stories', which is investigating the story telling interactions of augmentative and alternative communication (AAC) users. Before you decide whether you would like to take part, it is important that you understand why the research is being carried out and what your participation would involve. Please take time to read the following information carefully. If you have any questions please contact the researcher Pippa Bailey using the contact details provided at the end of the information sheet.

Thank you for reading this.

#### **People carrying out the research:**

- This project is an MPhil/PhD research study and has been designed by the researcher Pippa Bailey.
- The researcher has three supervisors who are all lecturers at the University of East Anglia, School of Allied Health to support and advise on the research study. The supervisors are Dr Karen Bunning, Dr Jan Mcallister and Dr Zoe Butterfint.

#### **What are the aims of the study?**

- To investigate the interaction that goes on when an AAC user produces stories with someone from their educational environment who does not use AAC.
- The project will also look at how the AAC user's stories change over the course of 6 months.
- This is something that could be important in improving the language opportunities of AAC users, as story-telling is a big part of the English National Curriculum.

#### **Who is organising the project?**

- The researcher has been awarded a studentship from the University of East Anglia to complete this research study.

#### **Who is responsible for the project?**

- The University of East Anglia is responsible for the project through the researcher Pippa Bailey
- There is a supervisory team made up of three lecturers from the University of East Anglia who will meet with the researcher at least once a month to monitor the progress of the research.



### **Ethical Approval of the Project**

- The Telling Stories project has been reviewed and approved by the School of Education and Lifelong Learning Ethics Committee.

### **Why are you asking me?**

- The researcher is aiming to recruit partnerships of AAC users and the teaching staff who are familiar with these children.
- This information sheet has been given to you as you are a member of teaching staff who works with a child using augmentative and alternative communication (AAC).

### **Do I have to take part in this project?**

- No, Participation in the study is entirely voluntary, and therefore it is entirely your choice whether you decide to take part.
- If you would like to participate you will be asked to sign a consent form to allow the researcher to gather audio and video samples of your interaction with the AAC user.
- Even if you volunteer you can withdraw from the study at any time, and you do not need to give a reason.
- If you choose to withdraw any data you have provided will be destroyed.
- Withdrawal from the study will have no affect on your employment, and will not affect your legal rights.

### **What would I have to do?**

- If you volunteer for the project you will be asked to take part in a total of six interactions with the AAC user that you work with.
- The interactions will involve you having a general conversation and then going through two simple story tasks with the AAC user. For example, you may be given a picture book for the AAC user to create a story from with your help.
- You will be given more information regarding the detail of the tasks if you chose to volunteer for the project.
- You will be both video and audio recorded throughout the conversation and tasks.
- This study is investigating the details of the interaction for example use of eye contact or hand gesture, and therefore no judgement or assessment of your skills would be made at any point throughout the project.

### **How long will it take?**

- Each recording session will last a maximum of 1 hour
- We would like to visit you 4 times. We would visit twice, followed by a three month gap and then another two visits.



- These interactions will take place during school time, so you will not be expected to give up any of your own free time to participate in the study.

**Potential risks, discomforts, or inconveniences**

- This study poses no risk to participants; however the experience of being video recorded may be uncomfortable for some people.

**Potential benefits of taking part**

- By taking part you will be helping to investigate how AAC users create stories with their teaching staff.
- This will allow areas to be identified that are important for AAC users in helping them to make stories and develop language

**What if you are unhappy about the project?**

- If you do not like the way the research is being conducted you can make a complaint to the University of East Anglia.
- You will be given information on how to make a complaint.

**Will information about me be kept confidential?**

- Anonymity of participants will be established by assigning an individual identification code to each participant from the very beginning of the study.
- This code will be used to refer to you throughout the entire project, the thesis and any publications that result from the study.
- Any data that you provide will be stored in locked filing cabinets in a secure office within the University of East Anglia. Computer files and data will be kept on secure, password protected server space
- Since you will be providing audio and video data, complete anonymity is not possible from the researcher and their supervisors.

**What will happen to the data?**

- The audio and video data you provide will be analysed by the researcher with support from the research team.
- Before any data and recordings are collected you will be asked whether you agree to your data being kept for various use, e.g. in future projects, for professional audiences (please refer to the consent form for more details).
- If you do agree to your data being used and stored, the data will be kept for a maximum of 5 years by the project researcher.
- If you don't agree all your data will be destroyed at the end of the project.


**What happens to the results of the project?**

- The results will be written about as part of the researcher's MPhil/PhD thesis, and may be written about for publication in relevant academic journals



### Contact Information

- If you have any questions at any time with regards to this study you can contact:

<p>Pippa Bailey Postgraduate Research Student in Speech and Language Therapy</p> <p><a href="mailto:P.Bailey@uea.ac.uk">P.Bailey@uea.ac.uk</a></p>	<p> 01603 593300</p> <p>At: School of Allied Health Professions, University of East Anglia, Norwich, Norfolk, NR4 7TJ.</p>
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**Thank you for taking the time to read this**



## Appendix B3



### INFORMATION ABOUT THE TELLING STORIES PROJECT FOR COMMUNICATION AID USERS

We are doing a **project**.

It is about how **people** with **communication aids** tell **stories**

Do **you** want to take part?

**Find out** more below.

You can also **talk** to a **teacher** about it.

**Thank You** for **reading** this.

The project is called **Telling Stories**.



### Who are the people doing the project?

- The person doing the project is called **Pippa Bailey**



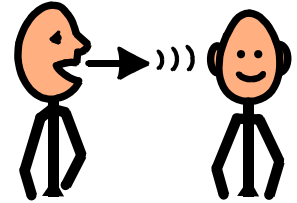
- She works at the **University of East Anglia**.





## What is the project about?

- The **project** will look at **how people** with **communication aids** tell **stories** to their **teachers** in their **school**.



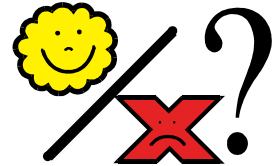
## Why are you asking me?

- Because **you** use a **communication aid**.



## Can I say 'No'?

- You **don't have to** take part.
- We will ask you if you want us to use a **video**.
- You can **change your mind** at **any time**. That's **O.K.**



## What happens if I say 'Yes'?

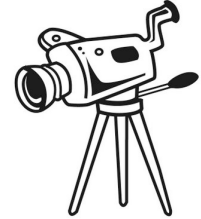
- **Pippa** will come to **see you** at **your school**.
- She will ask you to **tell** some **stories** with one of your **teachers**.





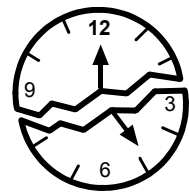


- We will use a **video camera** to record you.



## How long will it take?

- It will take about **an hour** to tell all of the **stories** with your **teacher**.

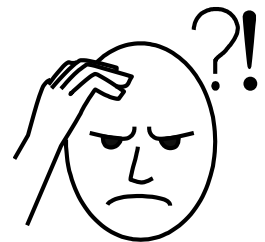


- We will **video you** telling **stories** for **1 hour a day** on **4 different days** over **3 months**.



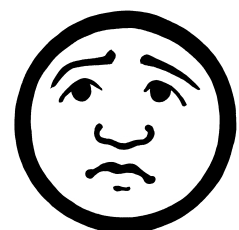
## Will it be difficult?

- People think that **telling stories** is usually **fun**.
- Being **filmed on video** may feel **odd** but people usually **get used to it**.



## What if I am unhappy about the project?

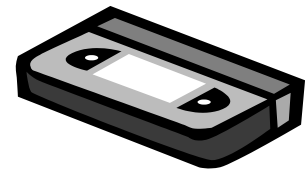
- If you do **not like** any bit of the **project**, you can **make a complaint**.
- One of your **teachers** will help you to **tell Pippa**.





## What will happen to the videos of me?

- We will ask you if it's O.K. to **show your videos** when we talk to **other people**.
- These are **other people** who use **communication aids** or who **work with children** and **adults with communication aids**.






## What will happen at the end of the project?

- **Pippa** will write the project up in a **book** and **tell other people** about it at presentations



## Talking to the person from the project – Pippa

If you want to find out more about the project you can **write**, **e-mail** or call me on the **telephone**.

<p><b>Pippa Bailey</b> Postgraduate Research Student in Speech and Language Therapy</p>	<p> 01603 593094</p> <p> <a href="mailto:P.Bailey@uea.ac.uk">P.Bailey@uea.ac.uk</a></p> <p> School of Allied Health Professions, University of East Anglia, Norwich, Norfolk, NR4 7TJ.</p>
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## Appendix B4



# The Telling Stories Project

## Parent/Carer Consent Form

Before you decide whether or not to give consent, please make sure you have read and understood the information sheet provided.

Name of Researcher: Pippa Bailey  
Name of Primary Supervisor: Dr. Karen Bunning

Name of Parent/Carer: \_\_\_\_\_

Contact Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E-mail Address \_\_\_\_\_

Contact Telephone no. \_\_\_\_\_

**Please tick ✓ the boxes if you agree with the sentence. Put X if you don't agree**

### Consent

I have read and understood the information sheet for the Telling Stories project, and **agree** to my child taking part.

I **do not agree** to my child taking part in the 'Telling Stories' Project

I give my consent to the following uses of recorded data showing my son/daughter/relative/client:

a) For use in the Telling Stories project

b) For use in publications and presentations to professionals, staff and AAC user



## Signatures

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Name of Primary Caregiver

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Name of researcher

\_\_\_\_\_  
Signature and Date

### **Please return completed form to:**

Pippa Bailey,  
School of Allied Health Professions,  
University of East Anglia, Norwich  
Norfolk  
NR4 7TJ



## Appendix B5



### Teaching Staff Consent Form The Telling Stories Project

You are being asked about taking part in a research study called 'Telling Stories', which is investigating the story telling interactions of augmentative and alternative communication (AAC) users. Before you decide whether or not to give consent, make sure you have read and understood the information sheet provided.

Name of Researcher: Pippa Bailey  
Name of Primary Supervisor: Dr. Karen Bunning

Name of Teaching Staff Member: \_\_\_\_\_

Contact Telephone No: \_\_\_\_\_

Email Address: \_\_\_\_\_

**Please tick ✓ the boxes if you agree with the sentence and put a X if you don't agree**

#### Project Information

I have read and understood the information sheet for the Telling Stories project, and **agree** to take part.

I **do not agree** to take part in the 'Telling Stories' Project

I give my consent to the following uses of recorded data showing myself

a) For use in the Telling Stories project

b) For use in publications and presentations to professionals, staff and AAC users



**Signatures**

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Name of Teaching Staff Member

\_\_\_\_\_  
Signature and Date

\_\_\_\_\_  
Name of researcher

\_\_\_\_\_  
Signature and Date

**Please return completed form to:**

Pippa Bailey  
School of Allied Health Professions  
University of East Anglia  
Norwich  
Norfolk  
NR4 7TJ

## Appendix B6

### Recruitment Poster

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**Story-telling and learning  
go hand in hand**

**But where does AAC fit in?**

**We are running a project called 'Telling Stories' to find out how children who use communication aids tell stories.**

- We are looking for children who use electronic communication aids, aged 6 to 16 who can put about 3-4 words together
- It doesn't matter if your child is in Special or Mainstream School

**At the end of the project each child who takes part will receive a DVD of their story-telling and an invitation to a story-telling workshop**

If you want more information or would like your child to take part please contact: **Pippa Bailey**

 P.Bailey@uea.ac.uk

 01603 593300

**UEA**  
University of East Anglia

## Appendix B7

### NS Participant Demographics

Participant	Position held	Number of years at the school	Total years working with children with SEN	Total time working with participant	Time spent with participant per week
NS1 (B)	Class Teacher	12 months	17 years AS is only experience with high-tech AAC	Approx. 6 months (2 terms)	Full school day 5 days per week
NS2 (S)	Communication specialist Teaching Assistant	9 years	9 years How many years high-tech aac??	3 years	1 morning per week (approx. 3 hours) and extra hours as requested by teacher
NS3 (J)	Class Teacher Senior Leadership Team	6 years	16 years (6years teaching) AS is only experience with high-tech AAC	Approx. 4 months (1.5 terms)	Full school day 5 days per week
NS4 (O)	Class Teacher	8 years	20 years AS is only experience with high-tech AAC	2 years	Full school day 5 days per week



## Appendix B8

### AS Participant Demographics

Participant (relevant NS)	Age at 1st data collection	Diagnosis	Communicative modalities	Length of time using current device	Expressive Language Receptive Language
B (NS1)	10:11	Athetoid Cerebral Palsy	<p>Dynavox MT4 – direct access with key guard.</p> <ul style="list-style-type: none"> <li>- Access: Direct access with key guard</li> <li>- First released: 2005</li> <li>- Screen size: 21cm x 15 cm</li> <li>- Operating system: Windows CE</li> <li>- Software: Gateway Series 4</li> </ul> <p>Speech Sign Gesture</p>	3 years	<p>Receptive – understands 2-3 Information carrying words consistently, can be more in context</p> <p>Expressive – Variable, uses 5-6 word utterances in speech. Reluctant to use AAC, mainly produces single words or a maximum of 2 linked.</p>
S (NS2)	12:08	Cerebral Palsy	<p>Powerbox 7 with Alea Intelligaze IG30</p> <ul style="list-style-type: none"> <li>- Access: Eye gaze with dwell selection</li> <li>- First released: 2011</li> <li>- Screen size: 12.1 inches</li> <li>- Operating system: Windows 7</li> <li>- Software: The Grid</li> </ul> <p>Gesture Body language Facial expression Symbol charts Letter board</p>	4 months	<p>P8/Level 1 receptive language P7 expressive language Consistently links 3 symbols, links more if appropriate vocabulary is available</p>

## Appendix B8

### AS Participant Demographics

Participant (relevant NS)	Age at 1st data collection	Diagnosis	Communicative modalities	Length of time using current device	Expressive Language Receptive Language
J (NS3)	7:11	ASD Fits ADHD profile but responded badly to medication	Tellus Mobi <ul style="list-style-type: none"> <li>- Access: Direct access</li> <li>- Screen size: 8.4 inches</li> <li>- Operating system: Windows XP</li> <li>- Software: MindExpress</li> </ul> Speech Sign Gesture Facial expression Environmental reference	4 months	P5b Speaking and listening SLT report (Dec '09): expresses himself with 1 keyword – noted to be more like 2 key words by teacher at time of data collection. Can sequence pictures with some support & can categorise pictures 100% accurately
O (NS4)	9:06	Dyspraxia Chromosomal Abnormality	Samsung NP-Q1 Ultra <ul style="list-style-type: none"> <li>- Access: Direct access or via stylus</li> <li>- First released: 2006</li> <li>- Screen size: 7 inches</li> <li>- Operating system: Windows Vista</li> <li>- Software: Q-talk</li> </ul> direct access Speech Signing Gesture	12 months	Receptive - good and consistent understanding of sentences at a 2 key word level. Expressive - Majority of communication through single word productions. Occasional linking of 2 words to form functional phrases

## Appendix B9

### Transcription Conventions

Convention	Description
Regular lower case type	Indicates naturally spoken elements
<i>'Italics with single quotation marks'</i>	Indicate AAC device output
Ellipses (.) (..)	Indicate pauses of varying length (.) being a short pause and (...) being a long pause)
Square brackets [ ]	Indicate overlapped speech or communication of a different modality
Parentheses ( )	Indicate actions, non-verbal communication
Parentheses with an asterisk (*)	Indicate unclear or unintelligible utterances
'Single quotation marks'	Indicate 'Interpretations or translations of meaning' used for interpretation of manual sign or graphic symbol utterances. This format is used when giving the meaning of facial expressions, gestures, pointing, etc.; for example, 'yes' (nodding) or 'no' (shaking the head).
CAPITAL LETTERS	Indicate manual signs or gesture
<u>CAPITAL LETTERS</u> <u>UNDERLINED</u>	Indicate manual signs or gesture produced in conjunction with natural speech
Forward slash / following manual sign or gesture e.g. <u>FINISH</u> /ed	Indicates speaker signing a word, e.g. finish, but speaking an alternative, e.g. finished.

Transcription conventions adapted with permission from: Von Tetzchner and Jensen (1997)

## Appendix B10

### NS Cue Card for Data Collection Sessions

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#### **Order of Stimuli: Fictional narrative – Personal Narrative**

1. Have a brief conversation and introduce the tasks
2. Introduce the storybook and look through the pictures together
3. Ask the student to tell you the story
4. Check they have finished their story
5. Give praise
6. Introduce the personal narrative by saying:  
“I’m going to tell you a story and then I’d like you to tell me one”
7. Tell a personal story on the topic provided
8. Ask the student to tell their story on the same topic
9. Check they have finished their story
10. Give praise

#### **Order of Stimuli: Personal narrative – Fictional Narrative**

1. Have a brief conversation and introduce the tasks
2. Introduce the personal narrative by saying:  
“I’m going to tell you a story and then I’d like you to tell me one”
3. Tell a personal story on the topic provided
4. Ask the student to tell their story on the same topic
5. Check they have finished their story
6. Give praise
7. Introduce the storybook and look through the pictures together
8. Ask the student to tell you the story
9. Check they have finished their story
10. Give praise

## Appendix B11

### Coding Category Definitions – Linguistic Move-Type

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#### **Preparations:**

##### ***Ready*** (R)

Moves that occur after the close of a dialogue game (roughly, a speech exchange) and prepare the conversation for a new game to be initiated

Often goes with a shift in topic or section of narrative.

Example: “Right so now you’re going to tell me a story about your Birthday ok?”

“Ok let’s turn to the next page then”

##### **Initiations:**

##### ***Instruct*** (I)

Commands the partner to carry out an action

Examples: “Look at me if we need to turn the page”

“Ignore that and have a good look to see if it’s there”

##### ***Explain*** (Ex)

States information that has not been directly elicited by the partner to provide some form of explanation.

Example: “You were on that page”

“I think we could use one of those words.”

##### ***Inform*** (In)

Provides information in relation to the narrative being constructed that has not been directly elicited by questioning from the conversation partner.

Example:

Without a question to prompt what is happening the AS states “and then the other friends come to play”

##### ***Check*** (C)

Requests the partner to confirm information that the speaker has some reason to believe, but is not entirely sure about. This can be just interrogative, shown through questioning intonation.

Example: “He got stuck in the fence didn’t he?”

“So we need that page again don’t we?”

“So do we need some joining words now so we can make it a sentence (..) Yeh?” - “Yeh?” to be coded as Check

- Align (AI)** Checks the partner's attention, agreement or readiness for the next move – often through use of participant's name  
Example: Use of the participants name to gain attention for next move – “Look at me Steph, I'll give you the options you need.”
- Query-YN (QYN)** Asks the partner any question that takes a yes or no answer and does not count as a check or align  
Example: “Is the word you're looking for there?”  
“Can you see the word Mummy?”
- Query-W (QW)** Any query not covered by the other categories – typically queries involving what, when, where, how, who, why and which (when not offered as a choice). A question used to elicit more than a yes/no response from the conversation partner.  
Example: “Which word do you think we could use?”  
“Where is he?”  
“What is the squirrel on?”
- Query-Choice** Provides the partner with a choice that is not (QCh) answered with a Yes or No.  
Example: “Are they on here or do we need another page?”  
“Is it the first one or the second one I showed you?”
- Query-Completion** A move in which the NS provides an incomplete sentence and pauses for the AS (QC) to then complete the move with the correct word
- Request help (RH)** A request for assistance in producing a communicative turn. A request can be made through verbal or non-verbal communication e.g. use of eye gaze towards NS and vocalisation. Often confirmed by the NS offering help in their next move, or checking assistance is wanted.

## **Responses:**

### ***Acknowledge***

(A)

A verbal response that minimally shows that the speaker has heard the move to which he/she responds, and may also demonstrate that the move was understood and accepted. Can be a repetition of the conversation partners' production, but adds no new information to the interaction.

Example: AS: "Squirrel" NS: "Ah squirrel on" (NS: coded as Acknowledgement)

"Right ok"

"Yes, that's fine"

### ***Object*** (O)

A minimal negative response to a move indicating that it was understood but not accepted (Grice and Savino, 1995)

Example: "Big (.) big what?" (Often indicated though surprised or objecting intonation)

### ***Reply-Y*** (RY)

Any reply to a query with a yes-no surface form that means `yes', however it is expressed – verbally or non-verbally

Example: Often shown in intonation and not necessarily through use of the word yes – "mmhmm" or nod of head

### ***Reply-N*** (RN)

Any reply to a query with a yes-no surface form that means `no', however it is expressed – verbally or non-verbally

Example: Often shown in intonation and not necessarily through use of the word No – Shaking head, facial expression or intonation showing negative response

### ***Reply-W*** (RW)

Any reply to any type of query that does not simply mean `yes' or `no'

Example: "He's on the tree"; "We need that one"

### ***Reply-Choice***

(RCH)

A response in which a choice is made when this has been offered previously by the conversation partner (QC)

- Reply-Completion (RC)** A response in order to correctly complete a sentence that has been purposefully left incomplete as requested by the conversation partner (using a QC)
- Clarify (Cl)** A reply to some kind of question in which the speaker tells the partner something over and above what was strictly asked  
Example: NS: "Is the squirrel there?" AS: "Yes, but there's a rabbit and badger but no mummy squirrel and an apple."
- Praise (Pr)** Any statement made to encourage or provide praise to the conversation partner.  
Example: "Good girl"  
"You've worked very hard, well done"  
"You're doing really well"
- Response to an Instruction (RI)** Any move made as a response to an instruction previously given by the conversation partner.  
Example: NS: "Look at me show me which row"  
AS: Looks at NS to indicate desired row (AS: move coded as response to an instruction)
- Comment (Co)** Any statement made that is neither a question nor response to a question, making comment on what is occurring in the interaction or environment. Often used to fill a pause or in communication breakdown due to a mistake on the AAC device. Adds new information to the interaction.  
Example: "Oh we don't want to press that do we!"  
"Oops where's that button gone"  
"I think you've decided now haven't you"
- Summarise (S)** A statement made that provides a summary of the narrative or part of the narrative that has been told up to that point. Often used due to the long pause between a question being asked and the next part of the narrative being provided. Often also used by the NS to



add grammatical features to the narrative which the AS can/has not.

Example:

After many turns in which the AS has answered questions about characters and location NS: “so squirrel on the tree and mummy Squirrel”

Questionable instance:

AS: Rabbit

NS: so rabbit

This is coded Acknowledgement as it adds no summary of the story it is just a direct repetition of what has been produced by the AS

### **No Communicative Function:**

**Repetition (Rep)** The act of repeating a word(s) produced by the conversation partner or AAC device with no communicative meaning.

Example:

NS: The house in the tree

AS: Tree

In some cases the AS may repeat what is produced by the AAC device, or say the word then select directly afterwards, this would be coded once as the appropriate response and the second production would be coded as a repetition

NS: Where do they live?

AS: *Tree* (coded as RW) Tree (coded as repetition)

### **Operation of Device - Other (OD)**

An instance in which the communication device is being accessed and producing output that is of no relation to the narrative task – pressing buttons on the device as a distraction/to explore the device.

Adapted from:

STIRLING, L., FLETCHER, J., MUSHIN, I. & WALES, R. (2001)  
Representational issues in annotation: Using the Australian map task corpus to relate prosody and discourse structure. *Speech Communication*, 33, 113-134.

## Appendix B12

### Coding Category Definitions – Communicative Modality

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<b>Target Behaviour:</b>	<b>Speech (Sp)</b>
Definition:	Speech refers to human communication through audible language (Encyclopaedia Britannica, 2009). In the case of this study, this includes all recognised vocabulary including fillers (erm, umm)
Elaboration:	Speech is coded when any participant initiates or is during production of a recognised vocabulary, including all fillers (e.g. err, um) that is directed towards another participant.
Example:	Participant A provides instructions on the task to be completed to Participant B by stating “You need to umm press that one there”
Questionable Instances:	Participant B makes a vocal utterance but this is unrecognisable as vocabulary from the English language (Code as Vocal Gesture) Participant A appears to be moving their lips and articulators, but speech is not audible to the coder due to high levels of background noise (Code as Not Possible to Code)
<b>Target Behaviour:</b>	<b>Vocal Gesture (V)</b>
Definition:	Vocal gesture refers to the voluntary production of a communicative vocalisation that is unrecognisable as any form of vocabulary (e.g. mmhmm with intonation suggesting agreement)
Elaboration:	Vocal Gesture is coded at any point in which a participant produces a vocal utterance that cannot be identified as part of a recognised vocabulary or as a filler within an interaction
Example:	Participant A is interacting with another participant and therefore Participant B attracts their attention by producing a vocalisation that cannot be recognised as a word from a known vocabulary Participant B is AAC encoding and looks to Participant A for reassurance, Participant A then produces the utterance mmhmm with rising intonation indicating agreement
Questionable Instances:	Participant A is talking to Participant B and at the time of the sample fills a pause in communication with the utterance ermm. (Code as Speech)

**Target Behaviour:** **Co-Action (CA)**  
**Definition:** Co-action refers to an instance in which the NS uses hand-on-hand (or on another part of the AS' body) as guidance into a posture or movement.  
**Elaboration:** Co-action is coded at any point in which the NS is physically assisting the AS by using their hand(s) to direct a part of the AS's body into a desired posture or movement (e.g. to assist the AS to access their communication device)  
**Example:** NS places hands on AS's hand and lower arm to direct their movement towards the switch for accessing the communication device.  
 NS helps steady the AS's head with both hands to assist the AS in controlling involuntary head movements whilst accessing their communication device via eye gaze.

**Target Behaviour:** **AAC-Encoding (AACE)**  
**Definition:** AAC-Encoding refers to any encoding of an AAC device via the access mode being used by the participant e.g. - touch of the device, switch access, eye gaze  
**Elaboration:** AAC-Encoding is coded when the participant is initiating or in the process of accessing the AAC device through the expected access method (touch screen, eye gaze, switch) in order to produce a communicative output.  
**Example:** Participant touches screen of AAC device to access vocabulary and form a response to conversation partner  
 Participant repeatedly touches switch as a mode of scanning through vocabulary object on their AAC device  
**Questionable Instances:** Participant touches screen once and an output is produced by the device (Coded AAC-Output)  
 Participant TA accesses AAC device to input missing vocabulary into device or complete technical correction to device (Coded Neutral)

**Target Behaviour:** **AAC-Output (AACO)**  
**Definition:** AAC-Output refers to any information sent by a participant to a communication partner(s) by synthetic or digitised speech produced from an AAC device. (Beukelman & Mirenda, 2005)  
**Elaboration:** AAC-Output is coded at any point during an output which has been produced by an AAC device as a result of AAC-encoding by the participant  
**Example:** Output of "Shopping" is produced by the AAC device.  
**Questionable Instances:** Sound quality of recording does not enable coder to identify whether speech heard has been produced vocally or via the AAC device (Code as Not Possible to Code)

**Target Behaviour:**

Definition:

**Eye Gaze (EP), (ED) or (EO)**

Eye gaze refers to the direction of the head and eye gaze of the participants. There are three sub groups within this category:

**Eye Gaze Person (EP)** – Refers to an instance in which a participant’s head direction and (if visible) eye gaze indicates they are looking at the other conversation partner.

**Eye Gaze Device (ED)** – Refers to an instance in which a participant’s head direction and (if visible) eye gaze indicates they are looking at the communication device in use.

**Eye Gaze Other (EO)** - Refers to an instance in which a participant’s head direction and (if visible) eye gaze indicates they are looking at something other than the device or other participant. E.g. The narrative stimuli

Elaboration:

Eye gaze is coded at any point during which a participant moves their head direction or eye direction indicating they are looking at any object or person. This is not dependent on length of eye gaze.

Example:

Participant A and B both look directly at each other and make eye contact, and hold this for several seconds. (Coded EP for both participants)

Participant A looks toward Participant B to gain eye contact but Participant B is looking at the communication device screen and therefore does not return the eye contact. (Coded as EP for Participant A and ED for Participant B)

Participant A looks at the narrative stimuli on the desk (Code as EO)

Questionable Instances:

Participant A looks over Participant B to something in the background (Code as EO)

Participant B looks at a person who has entered the room off camera (Code as EO)

**Target Behaviour:**

Definition:

**Facial and Body Gesture (G)**

Facial and body gesture refers to voluntary bodily actions by, by hands, head, facial movement or body which are intended as communicative. (Argyle, 1975)

Elaboration:

Gesture is scored at any point from initiation to termination of a gesticulation being used, that is not part of a recognised form of sign language, or in reference to an object within the surrounding environment. This includes facial gesture, when a participant voluntarily produces a facial display that clearly represents and communicates to other participants an emotional state (E.g. smiling, frowning) (Beukelman & Mirenda, 2005)

Example: Participant A shrugs shoulders while in response to an AAC-output made by Participant B  
Participant B indicates 'yes' by nodding head towards Participant A  
Participant B frowns to indicate a negative response

Questionable Instances: Participant A points to something in the background while talking to Participant B (Code as Environmental Reference)  
Participant B signs cat using Makaton Signing (Code as Sign)  
Participant B involuntarily moves their arm towards the device (Do not code as this is involuntary and therefore non-communicative)

**Target Behaviour:**

**Sign (S)**

Definition:

Sign refers to any use of a recognised Sign Language vocabulary (e.g. Makaton, BSL, Signalong) by any participant

Elaboration:

Sign is coded at any point during the completion of a sign that is identified as being from a recognised sign language vocabulary by any participant.

Example:

Participant A produces the sign for 'dog' during a conversation about family pets with participant B  
Participant A signs listen to participant B to gain their attention and instruct them to listen to instructions being given.

Questionable Instances:

Participant B uses a communicative gesture not recognised by the coder as being from any known sign vocabulary. (Code as Gesture)  
Participant B uses a gesture that is similar to a recognised sign but the coder cannot definitively recognise it as part of a sign language vocabulary (Code as Not Possible to Code)

**Target Behaviour:**

**Environmental Reference (Env)**

Definition:

Environmental Reference refers to an instance in which a participant uses a hand gesture (Normally pointing) to indicate an object within the communicative environment as a form of reference for the other communication partner.

Elaboration:

Environmental Reference is coded when any participant uses voluntary hand gesture to indicate an object within the communicative environment.

Example:

Participant A points to Participant B's AAC device while instructing Participant B where to find the relevant vocabulary.  
Participant B moves their hand to indicate a character within the fictional stimuli

Questionable Instances: Participant B moves their hand in the direction of their AAC device but this appears to be an involuntary movement (Code as Neutral)  
Participant A raises their hand to gain the attention of the Teacher in the classroom (Code as Gesture)

**Target Behaviour:**

**Not Possible to Code (NPC)**

Definition: NPC refers to a point at which the coder is unable to code the interaction due to sound or vision being restricted.

Elaboration: NPC is coded when the coder cannot hear any communicative interaction (sound quality, background noise) or see the communicative interaction (Video quality, zoom, obstruction by another person) for any reason.

Example: Unknown participant walks in front of the camera obstructing view but sound can still be heard. Even though sound can be heard the coder cannot be certain of who produces any sound as the interaction cannot be seen, therefore must code NPC.

Questionable Instances: Participant A is talking to Participant B but turns away from the camera for a short while, whilst continuing to talk (Code as Speech)  
Coder observes Participant B moving lips to form different shapes but cannot hear any vocalisations due to high level of background noise (Code as NPC)

**Target Behaviour:**

**Neutral (N)**

Definition: None of the above categories are met and therefore no communicative act is taking place within the experimental dyad.

Elaboration: Neutral is coded when no other codes are applicable and none of the participants are taking part in any form of communicative action

Examples: Both participants are sat looking at different parts of the room, no speech or non-verbal communication is being produced, and neither participant is touching the AAC device.

Questionable Instances: Participant B is looking towards the window, while Participant A looks at Participant B's face (Code as Eye Contact)  
Participant B touches the side of their AAC device while Participant A is looking at the floor (Code as Neutral)

Framework for definitions taken from Barlow & Hersen (1984): *Single Case Experimental Designs: Strategies for Studying Behavioural Change*. Oxford: Pergamon Press Plc.

# Appendix B13

## Narrative Stimuli

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### Personal Narrative Stimuli

Narrative topics selected as most appropriate from Allen et al. (1994) and Goldman (2008) for personal narrative elicitation:

- A Birthday
- Pets
- First day at school
- A Christmas

Standby Topics

- Last Weekend
- A visit to the hospital

### Fictional Narrative Stimuli

<b>Narrative</b>	<b>Publisher</b>	<b>Target Age Group</b>	<b>No. Of Pages</b>	<b>Repetition After</b>
The Squirrel Story (Carey et al., 2006)	Black Sheep Press Ltd.	3-6 years	11	10 weeks
Peter and the Cat (Leitao and Allen, 2003)	Black Sheep Press Ltd.	5-9 years	9	8-10 weeks
The Bus Story (Renfrew, 1991)	Speechmark Publishing Ltd.	3-8 years	4 (12 pictures)	12 weeks

# Appendix B14

## Vocabulary Lists

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### Session 1

#### Fictional Narrative

Squirrel Story – Black Sheep Press  
(Carey et al., 2006)

#### Object

Mummy Squirrel  
Baby Squirrel  
Squirrel  
Tree  
Forest  
House  
Sun  
Garden  
Flowers  
Rat  
Mouse  
Rabbit  
Fence  
Ball  
Apples  
Worm  
Snail  
Badger  
Field

#### Action

Live  
Said  
Play  
Eat  
Met  
Go  
Ran  
Stuck  
Push  
Pull  
Walk  
Help  
Shut  
Flew  
Sit  
Through  
Squeeze  
Get  
Try

#### Description

Big  
Little  
Sunny  
Hungry  
Naughty  
Fat  
Greedy  
Strong  
Giant  
Cross  
Angry  
Surprise  
Shock



## Personal Narrative

### A Birthday

#### Object

Present – enter specific present if known  
Toy  
Cake  
Party food  
Candles  
Friends – names or noun  
Mum  
Dad  
Other family members  
Party – if known enter specific vocab  
Swimming  
Bowling  
Cinema  
Games  
Balloons  
Party bags  
Music  
Film  
Entertainer/Man/lady  
Clown  
Costume

#### Description

Happy  
Fun  
Big  
Small  
Loud  
Funny  
Pretty

#### Action

Open  
Unwrap  
Blow  
Play  
Give  
Listen  
Watch  
Eat  
Drink  
Go  
Have  
Say  
Come  
Joke/tell jokes  
Dress up

**Session 2**  
**Fictional Narrative**  
**The Bus Story (Renfrew, 1991)**

**Object**

Bus  
Bus Driver  
Driver  
Spanner  
Tool  
Train  
Tunnel  
Hill  
Policeman  
Whistle  
People  
Town  
Fence  
Field  
Cow  
River/Lake/Pond  
Road

**Description**

Red  
Blue  
Happy  
Surprised  
Shocked  
Naughty  
Angry  
Fast  
Quick  
Scared  
White  
High  
Brown  
Big  
Small  
Sad

**Action**

Fix  
Mend  
Drive  
Run away  
Chase  
Follow  
Race  
Go  
Make/pull faces  
Disappear  
Whistle  
Blow (Whistle)  
Stop  
Jump over  
Go/drive up hill  
Go down hill  
Fall  
Splash  
Stuck  
Find  
Get out/recover/pull out

## Personal Narrative Christmas

### Objects

Presents  
Christmas Tree  
Santa Claus  
Decorations  
Lights  
Stocking  
Toys  
Food  
Christmas Dinner  
Turkey  
Christmas Pudding  
Family  
Mum  
Dad  
Carols  
Singing  
Music  
Television/TV  
Film

### Action

Open  
Unwrap  
Eat  
Drink  
Go  
Come  
See  
Watch  
Listen  
Play  
Put up  
Give  
Have

### Description

Green  
Red  
Fat  
Spiky  
Pretty  
Shiny  
Boring  
Exciting  
Happy  
Fun  
Funny  
Loud  
Yummy

**Session 3**  
**Fictional Narrative**  
**Peter & The Cat (Leitao and Allen,**  
**2003)**

**Object**

Peter  
Boy  
Animals  
Parrot  
Mouse  
Dog(s)  
Turtle/tortoise  
Cat  
Tree  
Bag/backpack  
Man  
Hose pipe  
Garden  
Bush  
Ladder  
Mum  
Lady  
House

**Description**

Shocked  
Surprised  
Scared  
Tall  
Big  
High  
Worried  
Orange  
Yellow  
Red  
Blue  
Old

**Action**

Meow  
Stuck  
Walk  
Look  
Climb  
Hold  
Shout  
Say  
Gardening  
Watering  
Hear  
Help  
Get down

**Phrases**

Help (me)  
Thank you

**Session 3**  
**Personal Narrative**  
**Pets**

**Object**

Dog  
Cat  
Rabbit  
Guinea Pig  
Mouse  
Hamster  
Fish  
Cage  
Hutch  
Tank  
House  
Mum  
Dad  
Siblings (Enter names as appropriate)  
Pet Food  
Lead  
Collar  
Toys

**Description**

Happy  
Sad  
Like  
Don't like  
Big  
Small  
Loud  
Quiet  
Funny  
Fluffy/furry  
Excited  
Brown  
Black  
White  
Grey  
Gold  
Messy

**Action**

Talk  
Go  
See  
Watch  
Play  
Listen  
Eat  
Drink  
Walk  
Want/would like  
Stroke  
Cuddle  
Feed  
Look after

**Session 4**  
**Fictional Narrative**  
**The Squirrel Story**  
Vocabulary as for Session 1

**Personal Narrative**  
**First Day at School**

**Objects**

School  
Classroom  
Teacher – can specify  
Children – can specify  
Friends  
Playground  
Hall  
Lessons – specify if wanted  
Home  
Bag  
Lunch box  
School lunches  
Assembly  
Work  
Homework  
Bell

**Action**

Play  
Talk  
Learn  
Read  
Work  
Chat  
Go  
See  
Watch  
Listen  
Eat  
Drink

**Description**

Scared  
Worried  
Happy  
Sad  
Like  
Don't like  
Big  
Small  
Loud  
Quiet  
Funny  
Fun  
Busy  
Hard work  
Tiring  
Favourite

## Appendix B15

### Guidance Sheet and Rules for Coding – Linguistic Move-Type

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Linguistic Move	Code
<b>Preparation</b>	
Ready	R
<b>Initiation</b>	
Instruct	I
Explain	Ex
Inform	In
Check	C
Align	AI
Query-YN	QYN
Query-W	QW
Query-Choice	QCH
Query-Completion	QC
Request for help	RH
<b>Response</b>	
Acknowledge	A
Object	O
Reply-Y	RY
Reply-N	RN
Reply-W	RW
Response to instruction	RI
Reply-Choice	RCH
Reply-Completion	RC
Clarify	CI
Praise	Pr
Comment	Co
Summarise	S
<b>No Communicative Function</b>	
Operation of device-Other	OD
Repetition	R

#### Rules for Coding Linguistic Move-Type

- None of these codes can co-occur
- On the transcript each turn may have more than one linguistic move within it
- If a participant starts a move then corrects themselves and restarts the same move only code the second part
- When coding responses look to the question asked previously for context

## Appendix B16

### Guidance Sheet and Rules for Coding - Communicative Modality

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<b>Communicative Modality</b>	<b>Code</b>
Speech	Sp
Vocal Gesture	V
Co-Action	Ca
AAC-Encoding	AACE
AAC-Output	AACO
Eye Gaze:	
Eye Gaze Person	EP
Eye Gaze Device	ED
Eye Gaze Other	EO
Facial and Body Gesture	G
Sign	S
Environmental Reference	Env
Not Possible to Code	NPC
Neutral	N

#### Rules for Coding Communicative Modality

- Speech and Vocal gesture cannot co-occur
- Co-action will always be coded for both participants as this is a shared communication modality
- AAC Encoding and AAC Output cannot co-occur
- Facial and body gesture, sign and environmental reference cannot co-occur as each is an individual form of bodily movement
- Not Possible to Code cannot co-occur with any other code
- Neutral cannot co-occur with any other code
- All other combinations of codes can co-occur:
  - E.g. Speech and Sign, Vocalisation and environmental reference, Facial and body gesture, speech and AAC output



## Appendix C1.1

### Participant B: Session One Fictional Narrative – The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	will you tell me that story using your Dynavox?		QYN
2	AS	ok		RY
3	NS	alright		A
4	AS	yeh		RY
5	NS	lovely (.) well we'll go through it together and we'll look at the pictures (.) and you can tell me the story as it's happening (..) ok		A Ex C
6	NS	here we go	turns to first page	R
7	AS	'squirrel'		In
8	NS	the squirrel (.) yep		A A
9	AS	(*unintelligible speech) (..) tree	accesses device looks at NS	In
10	NS	'yes' (nods) in the tree (.) alright	gives eye contact	A A
11	AS	vocalisation (..) and get house	accesses device	In
12	NS	yeh (.) Ok so the squirrels		A QC
13	AS	LOOK (unintelligible speech) tree house	gestures to device	RC
14	NS	right the squirrel's got a tree house (.) Is that right?		A C
15	AS	yeh		RY
16	NS	good (.) ok (..) and who does the squirrel live in the tree house with?		Pr A QW
17	AS	(*unintelligible speech) animals		RW
18	NS	alright (.) You need to go back don't you		A Ex
19	AS		accesses device	
20	NS	yes go on (.) go to animals that's right		A I A
21	NS	(point) who does mummy squirrel live with in the tree house? (.) she lives with (..) the	points to page	QW QC

22	AS	(*vocalisation)		RC
23	NS	who?		QW
24	AS	the baby		RW
25	NS	the baby		A
26	AS	the Baby		RW
27	NS	that's right she lives with the baby squirrel doesn't she		A S
28	AS	(*vocalisation)		
29	NS	can you find baby squirrel?		QYN
30	AS	erm maybe		RY
31	NS	try in animals (point)	points to device screen	I
32	AS		accesses device	RI
33	NS	ah (.) oh look (point)	points to device screen	A I
34	AS	and then other friends come		In
35	NS	ah the friends they come and	turns page	A QC
36	AS	and play		RC
37	NS	and play (.) and who are the friends?		A QW
38	AS	(point) the baby mouse	points to page	RW
39	NS	'yeh' (nods) baby mouse (.) and		A QC
40	AS	(point) the baby rabbit	points to page	RC
41	NS	'yeh' (nods) the baby rabbit (.) oh and where are they going to play?		A QW
42	AS	(*unintelligible speech)  (*continues unintelligible speech)	looks at device	RW
43	NS	saying come through here?		C
44	AS	and (point)	points to page	In
45	NS	come through here and		A QC
46	AS	apples		In
47	NS	'yes' (nods) get some apples (.) that's right		A A
48	NS	so did they go through?	turning page	QYN
49	AS	(*vocalisation) (point) (.) the baby squirrel go get some (.) (*vocalisation) (.) (*vocalisation) (.) them apple trees	points to page	In
50	NS	there are some apple trees (.) there's lots of apple trees (.) and what did they do?		A Co QW
51	AS	(*unintelligible speech) (.) (point) the baby rabbit (.) and the baby mouse	points to page	RW
52	NS	the baby rabbit and the baby mouse		A QC
53	AS	(*unintelligible speech)		RC

54	NS	went through the fence		C
55	AS	yeh		RY
56	NS	could they get through the fence?		QYN
57	AS	(point) (*unintelligible speech) (.) get through	points to page	RY
58	NS	could they get through?		QYN
59	AS	yeh (point) (..) (*unintelligible speech) (.) through	points to page	RY
60	NS	but what happened to him? (point)	points to page	QW
61	AS	stuck		RW
62	NS	he got stuck (point) (..) why?	points to page	A QW
63	AS	because (.) (*unintelligible speech)		RW
64	NS	what? (*laughs) (.) he'd		QW QC
65	AS	(*unintelligible speech)		RW
66	NS	had he eaten so much		QYN
67	AS	(point)	points to page	In
68	NS	what had he been eating?		QW
69	AS	(point) (*unintelligible speech) (.) a worm	points to page	In
70	NS	there's a worm in an apple (.) (point) yes I think they left that apple because there's a worm in it	points to page	A Co
71	NS	but what had they done with all the others? (point)	points to page	QW
72	AS	eaten them (.) up		RW
73	NS	they ate them up didn't they (.) and they got very very		A QC
74	AS	fat		RC
75	NS	very fat (.) oh	turning page	A
76	AS	(point) (*vocalisation)	points to page	In
77	NS	what happened?		QW
78	AS	THAT (point)	point to page	RW
79	NS	what did they have to try and do? PUSH	uses gesture to indicate 'push'	QW
80	AS	push		RW
81	NS	<u>PUSH</u>	uses gesture to indicate 'push'	A
82	AS	and pushed		In
83	NS	and <u>PUSH</u> /ed	uses gesture to indicate 'push'	A
84	AS	and pushed		In
85	NS	and <u>PUSH</u> /ed (.) but could could they get him out? (.) could they get him through the fence? (point)	uses gesture to indicate 'push' points to page	A QYN QYN
86	AS	the baby rabbit and the baby mouse		In

87	NS	they weren't [strong]		Co
88	AS	they pushed and [pushed and pushed]		In
89	NS	[yes (.) and pushed] (.) oh gosh they pushed so hard (.) it was no good though		A Co
90	NS	who came along?		QW
91	AS	(*unintelligible speech)		RW
92	NS	who came to help?		QW
93	AS	(point) mister (*unintelligible speech)	points to page	RW
94	NS	mister		QC
95	AS	worm (point)	points to page	RC
96	NS	Mr Badger (..) can you find him (.) is he there? (..) no (.) no he's not there is he		O QYN Co
97	NS	what did Mr Badger do? (point)	points to page	QW
98	AS		looks and gestures towards device	
99	NS	do you want to have a look on the other page and see if you can see him? (point)	points to device screen	QYN
100	AS	ok	accesses device	RY
101	NS	is he there?		QYN
102	AS	and the sun (point)	points to device screen	In
103	NS	and the sun's there yes it was a sunny day wasn't it		A Co
104	NS	so what did Mr Badger do?		QW
105	AS	erm (.) (*unintelligible speech)		RW
106	NS	what did he have to do? LOOK (point)	points to page	QW
107	AS	(*unintelligible speech)		RW
108	NS	he (.) PUSH	uses gesture to indicate 'push'	QC
109	AS	pushed and pushed and pushed		RC
110	NS	and what happened?	turns page	QW
111	AS	LOOK THAT (*unintelligible speech)	gestures towards page	RW
112	NS	the baby squirrel		A
113	AS	he <u>FLY</u> (*unintelligible speech)	uses one arm to gesture flying	RW
114	NS	he (..) flew didn't he (..) he flew		A
115	AS	(*vocalisation)		
116	NS	flew (point)	points to page	A
117	AS	(*unintelligible speech)		In
118	NS	where did he end up?		QW
119	AS	(point) (*vocalisation) (.) home	points to page	RW
120	NS	'yes' (nods) he went home (..) what did his mum say?		A QW

121	AS	hello		RW
122	NS	(*laughs) that's right (.) hello (..) Is that all she said?		A QYN
123	AS	(*unintelligible speech)		RN
124	NS	oh		A
125	AS	(*unintelligible speech)		In
126	NS	do you think Mum was glad to have him home?		QYN
127	AS	(point) (*?you been playing)	points to page	RW
128	NS	have you been playing (.) and what does Mum say to you when you come home from school? (.) have you been		A QW QC
129	AS	good		RC
130	NS	have you been good (.) do you think mummy squirrel said I hope you've been good 'yes' (nods)		A QYN
131	AS	yeh		RY
132	NS	yeh (..) oh have we got more story?	turns page	A QYN
133	AS	yeh		RY
134	NS	is there?		C
135	AS	(*unintelligible speech) (.) then they had a party	turns back to last page	RY In
136	NS	and then they had a party did they (.) oh (.) and why did they have a party?		A QW
137	AS	(*unintelligible speech)	takes book	RW
138	NS	with music		A
139	AS	and dance		In
140	NS	and dancing		A
141	AS	(*unintelligible speech)		In
142	NS	oh well that was a lovely story (.) is that the end of the story?		A Pr QYN
143	AS	erm no	opens book	RN

## Appendix C1.2

### Participant B: Session One Personal Narrative – A Birthday

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	so will you tell me a story now about your Birthday?		QYN
2	AS	ok (.) (*unintelligible speech)	accesses device	RY
3	NS	what was your favourite Birthday?		QW
4	AS	(*?a present) HERE'S A PRESENT	uses gesture to indicate giving a present to NS	RW
5	NS	a present (.) someone said here is a present	gestures taking the present from AS	A
				C
6	AS	yeh		RY
7	NS	right (gesture) (..) oh and what was in this present that you got for your birthday?	gestures holding imaginary present	A
				QW
8	AS	erm (.) (*vocalisation) books		RW
9	NS	books?		C
10	AS	yeh		RY
11	NS	and what was the story what were the stories about?		QW
12	AS	(*unintelligible speech) (.) my mummy (.) playing with me		In
13	NS	mummy played with you		C
14	AS	yeh		RY
15	NS	lovely		A
16	AS	in [the garden]		In
17	NS	[who else played] with you? In the garden		QW
18	AS	erm my my Daddy (.) my daddy		RW
19	NS	daddy played with you		C
20	AS	yes		RY
21	NS	so there was mummy (.) Can you tell me (.) from here (point)	points to device	S
				I
22	NS	tell me who [was there]		I
23	AS	[ok] (..) (*vocalisation) (.) how (.) 'how'		RY
				QW
24	NS	'yes' (nods) how (.) I'd like you to use your Dynavox please		A RW

25	NS	tell me who was there at your Birthday		I
26	AS	(*vocalisation) (.) who (.) 'who'		QW
27	NS	yes who		A
28	AS	who was there		Co
29	NS	can you tell me who was there please		I
30	AS	(*unintelligible speech)	looks at NS	RY
31	NS	'yes' (nods) tell me about your Birthday		A I
32	AS	erm (*vocalisation) (.) what (.) 'what'		QW
33	NS	and you can tell me what you got (.) as a present		RW
34	AS	(*vocalisation)	looks at NS	NPC
35	NS	go on then (.) You need to go to the Birthday page (point)	points to device screen	I Ex
36	AS	ok	accesses device and changes page	RI
37	NS	right (.) who was there?		R QW
38	AS	(*unintelligible speech) (...) (point) my family	accesses device points to device screen	RW
39	NS	'yes' (nods) go on then		A I
40	AS		accesses device	RI
41	NS	tell us who was there		I
42	AS	(*unintelligible speech)	accesses device and changes page	RI
43	NS	good (.) ok (.) Rright who [was there?]		Pr R QW
44	AS	[(*vocalisation)]		
45	NS	there was		QC
46	AS	(*unintelligible speech)	(selects D*name on device)	RC
47	NS	D*name		A
48	AS	(*vocalisation)		
49	NS	and who else?		QW
50	AS	and Daddy		RW
51	NS	'yes' (nods) Daddy		A
52	AS	and Mummy	selects Daddy on device	RW
53	NS	good		Pr
54	AS		selects Mummy on device	
55	NS	anyone else?		QYN
56	AS	(*vocalisation)		
57	NS	ok so there was D*name (.) Daddy and Mummy (..) can you	points to device	A S

		tell us then (point)		I
58	AS	yeh (.) 'D*name Daddy Mummy'		RY RI
59	NS	GOOD (nods) (.) and they were there and what did you do?		Pr A QW
60	AS	had presents		RW
61	NS	you had presents		A
62	AS	'yes' (nods)		RY
63	NS	oh right [can we]		A
64	AS	[(*unintelligible speech)] (..) car		In
65	NS	you got a car?		C
66	AS	yeh		RY
67	NS	yes (.) what sort of a car?		A QW
68	AS	(*unintelligible speech)		RW
69	NS	a rocket car?		C
70	AS	yeh		RY
71	NS	was it <u>REMOTE CONTROL</u> ?	uses gesture to indicate car moving along ground	QYN
72	AS	yeh (..) (*unintelligible speech)		RY
73	NS	shall we see what's on the presents? (point) (..) see what there is	points to device screen	QYN I
74	AS	erm (.) Daddy and Mummy		In
75	NS	and where was your Birthday? At		QW QC
76	AS	at (.) home		RC
77	NS	at home 'yes' (nods) (.) lovely (..) and did you have a nice tea?		A QYN
78	AS	yeh		RY
79	NS	what did you have?		QW
80	AS	(*unintelligible speech)		RW
81	NS	ice cream?		C
82	AS	yeh		RY
83	NS	ooh lovely (..) is it your favourite?		A QYN
84	AS	yeh		RY
85	NS	yes (.) good (.) and did you have cake?		A Pr QYN
86	AS	yeh		RY
87	NS	with candles?		QYN
88	AS	yeh (.) (*vocalisation)		RY
89	NS	how many candles?		QW
90	AS	<u>ONE</u> (.) <u>TWO</u> (.) <u>THREE</u> (.) <u>FOUR</u> (..) <u>FIVE</u> (.) <u>SIX</u> (.) <u>SEVEN</u> (.) <u>EIGHT</u> (.) <u>NINE</u> (..) <u>TEN</u>	holds out both hands to indicate10	RW
91	NS	ten candles (.) that's lovely (..) so		A



		that was your tenth Birthday		Co C
92			** B's feed starts beeping, NS switches this off and comments "there we are all switched off" **	
93	NS	so you had 10 candles (.) and what did you have to do with the candles?		S QW
94	NS	did you blow them out?		QYN
95	AS	yeh		RY
96	NS	CANDLES go on then (.) these are your candles	holds up hands and wiggles fingers to indicate candles	I Ex
97	AS		blows toward NS hand	RI
98	NS	ooh (.) oh <u>SOME HAVE GONE BUT NOT ALL OF THEM</u> () (..) blow them again	blows towards hand puts some fingers down but keep others up	Ex I
99	AS		blows towards NS hand	RI
100	NS	oh that's better they're all gone now	puts all fingers down as AS blows	Co
101	NS	mmm and did you do anything special on your Birthday?		QYN
102	AS	yeh		RY
103	NS	what did you do?		QW
104	AS	(*unintelligible speech) (.) everybody said Happy Birthday [B]		RW
105	NS	[that's lovely] (.) Happy Birthday B		A Co
106	AS		uses electric wheelchair to make beeping noise	In
107	NS	oh you played a tune did you?		QYN
108	AS	yeh		RY
109	NS	did they all play musical instruments? (.) and make a lot of noise		QYN
110	AS	yeh		RY
111	NS	lovely (..) well done		A Pr
112	AS	(*unintelligible speech)		NPC
113	NS	sorry?		QW
114	AS	<u>HERE'S A CUP</u>	gestures giving a cup to the NS	In
115	NS	here's a cup?	gestures taking pretend cup from AS	C

116	AS	yeh		Ry
117	NS	thank you (..) and what do we have to do now (.) say <u>HAPPY BIRTHDAY</u> B	gestures raising her cup in a toast	A QW RW
118	AS	(*vocalisation)		
119	NS	<u>HAPPY BIRTHDAY</u> (.) is that right?	gestures raising her cup in a toast	A C
120	AS	yeh		Ry
121	NS	oh and was that the end of your lovely Birthday?		QYN
122	AS	'yes' (nods) (.) today is B's Birthday		Ry In
123	NS	B's Birthday <u>THAT'S RIGHT</u> (nods)		A
124			**NS2: what today?*	
125	NS		**no it's alright we're in the middle of something R sorry (..) B's telling me about his Birthday**	
126			**NS2: ahh **	
127	NS	alright?		C
128	AS	yeh		Ry
129	NS	so is that the end of your Birthday story?		QYN
130	AS	yeh		Ry
131	NS	<u>YES</u> (nods) (.) thank you		A A
132	AS	[ok]		A
133	NS	[that was lovely]		Pr

## Appendix C1.3

### Participant B: Session Two Fictional Narrative – The Bus Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	ok then there's the story (gesture) (.) what happens?	holds book in front for AS to see	R QW
2	AS	(*unintelligible speech) (.) the big red bus		RW
3	NS	'yes' (nods) the big red bus		A
4	AS	(*vocalisation) (point)	points to page	RW
5	NS	THERE	looks at AS and points to same picture	A
6	AS	(*unintelligible speech) (.) and the bus driver		RW
7	NS	'yes' (nods)		A
8	AS	(*unintelligible speech) (.) and the bus (.) (*unintelligible speech)		RW
9	NS	right the bus driver is here (point) and the bus is	points to page	Ex QC
10	AS	(*unintelligible speech) (point)	points to page	In
11	NS	what's it doing? (point)	points to page	QW
12	AS	it go		RW
13	NS	it's going (.) the bus has gone (..) huh	turns page	A A
14	AS	(point) the big red bus	points to picture on page	In
15	NS	'yes' (nods) (.) the big red bus		A
16	AS	and the little blue train		In
17	NS	and the little blue train		A
18	AS	THEN (point)	points to next picture	
19	NS	'yes' (point)	points to same picture	
20	AS	(point) the big red bus	continues pointing to picture	In
21	NS	'yes' (nods)		A
22	AS	and the little blue train (.) through the tunnel		In
23	NS	'yes' (nods) (point) the big red bus (.) and the little blue train goes through the tunnel	points to picture	A S
24	NS	good (.) what happens next?		Pr QW
25	NS	(point) what happens now?	points to next picture	QW

26	AS	he blow a (.) (*unintelligible speech) (.) the whistle blows		RW
27	NS	(point) a whistle blows (.) that's right (.) why does the whistle blow?	points at page	A A QW
28	AS	[WOOOOO]	puts hand to lips and mimics blowing whistle	In
29	NS	[(*whistles)] (..) is that right?		A C
30	AS	yeh		RY
31	NS	good (.) yeh (..) why is it blowing?		Pr A QW
32	AS	the policeman		RW
33	NS	'yes' (nods) the policeman's blowing the whistle		A
34	AS		tries to turn page	
35	NS		helps and turns page	
36	NS	oh (.) did the bus stop?		QYN
37	AS	(points) (*unintelligible speech) (..) big red (.) the big red bus	points to page	In
38	NS	'yes' (nods) the big red bus		A
39	AS	JUMP (.) the gate	AS jumps in chair	In
40	NS	jumped		C
41	AS	yeh (point)	points to picture	RY
42	NS	jumped the gate (point)	points to picture	A
43	AS	jumped (point)	points to picture	In
44	NS	jumped		A
45	AS	(point) over fence	points to picture	In
46	NS	'yes' (nods) over the fence		A
47	AS	the cow		In
48	NS	the cow	whispered	A
49	AS	looking (.) (*unintelligible speech) (.) the big red bus (point)	points to picture	In
50	NS	the cow was looking at the bus		A
51	AS		turns page	
52	NS	huh (.) oh		Co
53	AS	(point) LOOK (*vocalisation)	points to picture	
54	AS	the big (point) (..) the (.) big (.) red bus	points to picture	In
55	NS	'yes' (nods)		A
56	AS	(*unintelligible speech) stop	accesses device	In
57	NS	the big red bus stop (.) stop (.) stop (.) good		A Pr
58	AS	(point) (*vocalisation) (.) he splash	points to picture	In
59	NS	it crashed?		C
60	AS	yeh		RY

61	NS	uh (.) was it splashed?		C
62	AS	yeh		RY
63	NS	splashed (.) it [splashed]		A
64	AS	[(*vocalisation)]		
65	NS	(*vocalisation)		
66	AS	(point) (*vocalisation) (.) and (.) and the big red bus (.) (*unintelligible speech) (.) was sad	points to last picture	In
67	NS	was bad? (.) oh he was sad (.) the big red bus was sad		C
				A
				A
68	AS		turns page	
69	NS	Oh (.) that was a lovely story well done		A Pr

## Appendix C1.4

### Participant B: Session Two Personal Narrative - A Christmas

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	can you tell me about your Christmas?		I
2	AS	(*vocalisation)		RI
3	NS	oh (.) what happens at your house at Christmas time?		A QW
4	AS	(*unintelligible speech)	accesses device and selects toys	RW
5	NS	ooh you got		QC
6	AS	(*unintelligible speech)	accesses device	RC
7	NS	toys and		QC
8	AS	(.) Christmas Dinner	accesses device and selects Christmas dinner	RC
9	NS	oh lovely (..) toys and food and Christmas dinner (.) what do you have for your Christmas dinner?		A A QW
10	AS	(*unintelligible speech) (.) had a chicken		RW
11	NS	you had a chicken?		C
12	AS	yeh		RY
13	NS	did you (..) have we got chri (point) are there any more pictures there if we put Christmas (.) no (.) now let me	points to device screen and then accesses device  continues accessing device	A Co
14	AS	let me go back		Ex
15	NS	yes (.) I have gone back (.) there aren't any more there	accesses device	A Ex Ex
16	AS	(*vocalisation)		NPC
17	NS	right can you clear that one for me (point)	points to device screen	I
18	AS	(*vocalisation)	accesses device to clear word	RI
19	NS	ah and again		I
20	AS		accesses device to clear word	RI

21	NS	good boy (.) right what are you telling us then? (point)	points to device screen	Pr QW
22	NS	so you had		QC
23	AS	'toys food Christmas'		RC
24	NS	toys food and Christmas		A QC
25	AS	dinner		RC
26	NS	'yes' (nods) Christmas dinner (.) right (.) can we make it say Christmas dinner? (point)	points to device screen	A QYN
27	AS		accesses device	RY
28	NS	do you want to clear that first?		QYN
29	AS		accesses device	RY
30	NS	Christmas		QC
31	AS	dinner		RC
32	NS	'yes' (nods) Christmas dinner (.) ok and can you what did you have for your Christmas dinner?		A QW
33	AS	(*vocalisation)		RW
34	NS	what did you have?		QW
35	AS	(*vocalisation) (.) (*unintelligible speech)		In
36	NS	you cried and cried? (..) on Christmas?		C
37	AS	yeh		RY
38	NS	why? (..) how are you supposed to feel at Christmas? (.) very		QW QW QC
39	AS	(*vocalisation)		NPC
40	NS	how do you feel at Christmas time? I felt very very happy (point)	points to self to indicate 'I'	QW In
41	NS	how do you feel at Christmas?		QW
42	AS	(*vocalisation) (.) pleased		RW
43	NS	very pleased (.) what were you pleased with?		A QW
44	AS	(*unintelligible speech)		NPC
45	NS	what were you pleased with?		QW
46	AS	(*vocalisation) (.) can you help me?		QYN
47	NS	can I help you? (.) can I help you do what?		C QW
48	AS	pull (..) pull	puts hand out	RW
49	NS	pull (.) what are we going to <u>PULL</u> ?	puts hand out to gesture pulling	A QW
50	AS	the cracker PULL	takes NS hand	RW
51	NS	we are going to pull the cracker (.) ready?		A R

52	NS	1 (.) 2 (.) 3 (.) <u>BANG</u> (..) oh <u>WHAT DID YOU GET IN YOUR CRACKER?</u>	releases AS hand suddenly NS holds hand out	In QW
53	AS	(*unintelligible speech)		RW
54	NS	something to go on <u>HERE?</u>	NS touches AS on head	QW
55	AS	a hat		RW
56	NS	you got a hat (.) and I got a funny joke <u>LOOK</u> (..) only it's not very funny (.) and <u>DID YOU GET SOMETHING ELSE?</u>	pretends to open piece of paper holding hands out again	A In QYN
57	AS	(*vocalisation)		RY
58	NS	oh what's that?		QW
59	AS	another cracker		RW
60	NS	another cracker (.) oh (.) right what else do they have at Christmas time?		A QW
61	AS	(*vocalisation)		
62	NS	do you have any of these things at your house? (point)	points to device screen	QYN
63	AS	(*unintelligible speech) (point) singing	points to device screen	RY
64	NS	singing (.) and what do you sing?		A QW
65	AS	a Merry Christmas		RW
66	NS	right (.) go on then (point)	points to device screen	A I
67	AS	singing		RI
68	NS	singing (.) Merry Christmas (.) can we sing then?		A QYN
69	AS	[ok]		RY
70	NS	[ready]		R
71	NS	(*singing) we wish you a (..) Merry (.) [Christmas]		QC
72	AS	[Christmas]		RC
73	NS	(*singing) we wish you a Merry		QC
74	AS	Christmas (.) and Happy New (..) Year		RC
75	NS	<u>WOOO WELL DONE B</u> lovely singing (.) so (.) so you have a lovely Christmas time (.) [at your house]		Pr QYN
76	AS	[yeh]		RY
77	NS	and (.) do people come and stay at your house at Christmas?		QYN
78	AS	(*unintelligible speech)		NPC
79	NS	who is at your house at Christmas time?		QW
80	AS	(*unintelligible speech) (.) (*unintelligible speech)		NPC



81	NS	how d'you get		
82	AS	(*unintelligible speech) (...) Merry Christmas		In
83	NS	Merry Christmas (.) who do you say Merry Christmas too?		A
84	AS	you		QW
85	AS	you		RW
85	NS	to me (point) (.) thank you Merry Christmas B (.) we're a bit early	points to self	A Co Co
86	NS	who did you say Merry Christmas to <u>LAST CHRISTMAS</u> ?	moves head back to gesture past	QW
87	AS	(*unintelligible speech)		In
88	NS	you have to go to sleep?		C
89	AS	yeh		RY
90	NS	why?		QW
91	AS	(*unintelligible speech)		NPC
92	NS	who will come if you go to sleep?		QW
93	AS	(*unintelligible speech)		NPC
94	NS	who will come if you go to sleep? (..) at Christmas time		QW
95	AS	wake up (.) It's Christmas Day		In
96	NS	(*laughs) oh (.) wake up its Christmas time (.) who did you say that to?		A QW
97	AS	(*unintelligible speech)		NPC
98	NS	and (.) oh lots of presents		Co
99	AS	B had a <u>CUSHION</u>	holds arms out wide to indicate a big cushion	In
100	NS	a cushion?		C
101	AS	yeh		RY
102	NS	oh a big cushion?		QYN
103	AS	yeh		RY
104	NS	was it (.) and was it for you?		A QYN
105	AS	yeh		RY
106	NS	oh lovely (.) and did D*name get a Christmas present?		Co QYN
107	AS	yeh		RY
108	NS	What did D*name get?		QW
109	AS	a toy (.) a toy car		RW
110	NS	a toy car (.) oh lovely		A Co
111	AS	and I got a toy (*unintelligible speech)		In
112	NS	and you got a toy		QC
113	AS	(*unintelligible speech)		RC
114	NS	king?		C
115	AS	yeh		RY
116	NS	really?		C

117	AS	yeh		Ry
118	NS	oh right (.) and what did he do?		A QW
119	AS	(*unintelligible speech) and Thomas		In
120	NS	ah you got some Thomas things		A
121	AS	yeh		Ry
122	NS	yeh (.) right (.) was that a Thomas book or a Thomas film?		A QCH
123	AS	Thomas film		RCH
124	NS	Aafilm (.) right (.) oh lovely (.) so that was lovely Christmas presents		A Co
125	AS	Merry Christmas (.) Merry Christmas C		In
126	NS	Merry Christmas B		Co
127	AS	thank you C		A
128	NS	you're very welcome (.) thank you		Co A
129	AS	(*vocalisation)		NPC
130	NS	and is that the end of our Christmas story today?	puts hands to side in a questioning gesture	QYN
131	AS	(*unintelligible speech)	pulls NS head towards him and kisses head	In
132	NS	ooh am I getting a Christmas kiss? THANK YOU (.) is that what that was (..) Happy Christmas	rubs AS' shoulder	QYN QYN Co
133	AS	(*unintelligible speech) (.) (*sighs)		NPC
134	NS	(*sighs)		
135	AS	(*unintelligible speech)		In
136	NS	the children?		C
137	AS	(*unintelligible speech)		In
138	NS	are cross?		C
139	AS	yeh		Ry
140	NS	why are they cross about?		QW
141	AS	me		RW
142	NS	why?		QW
143	AS	(*unintelligible speech) (*sighs)		NPC
144	NS	(*sighs)		
145	AS	(*unintelligible speech)		In
146	NS	I don't think the children were cross at Christmas time I think they were very happy		Co
147	AS	(*vocalisation)		
148	NS	I think they all like their <u>PRESENT/s</u>	uses gesture to indicate unwrapping	Co

			a present	
149	AS	(*vocalisation)		In
150	NS	Mum and Dad like Christmas?		QYN
151	AS	(*vocalisation) (.) my Mummy and Daddy (.) (*unintelligible speech)		In
152	NS	Mummy and Daddy		A
153	AS	(*vocalisation) Christmas		In
154	NS	Christmas yep		A
155	AS	(*unintelligible speech)		NPC
156	NS	I bet they like to see you open your <u>PRESENT</u> (..) and do they have presents?	uses gesture to indicate unwrapping a present	Co QYN
157	AS	yeh		RY
158	NS	oh Lovely (..) and what dos Santa Claus leave for Mummy?		A QW
159	AS	flowers		RW
160	NS	flowers?		C
161	AS	(*unintelligible [speech])		RY
162	NS	[so are] you looking forward to this Christmas?		QYN
163	AS	C said Merry Christmas B (.) Merry Christmas C		Co
164	NS	Merry Christmas B (.) we've got a while to wait though haven't we		Co Co
165	AS	(*vocalisation)		NPC
166	NS	we've got summer holidays first and then we've got (..) we've got Halloween and Bonfire Night and then it will be Christmas again		Ex
167	NS	is that right? (..) all the <u>PRETTY LIGHTS</u> (..) and shopping	gestures twinkling lights with fingers	C Co
168	AS	(*vocalisation) 'yes' (nods)		RY
169	NS	and then Santa Claus will come		Ex
170	AS	(*vocalisation) (.) (*unintelligible speech) it's Halloween		In
171	NS	Halloween?		C
172	AS	[yeh]		RY
173	NS	[yes] that's right (..) that's another time though (..) I just mentioned that (..) We've got Halloween then Bonfire night then it will be Christmas again		A Ex
174	NS	alright		C
175	AS	(nods)		RY
176	NS	that was a lovely Christmas story		Pr
177	AS	[(*sighs)]		
178	NS	[(*sighs)] well Done		Pr

## Appendix C.1.5

### Participant B: Session Three Fictional Narrative - Peter and the Cat

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	so (.) Shall we look through the book together (.) and you tell the story		R I
2	AS		looks at book	
3	NS	what's the story called?		QW
4	AS	Peter (.) and (.) and (.) the (.) [cat]		RW
5	NS	['yes' (nods) Peter and] the cat (.) right	turns page	A R
6	AS	(point) the parrot's on his head	points to page	In
7	NS	'yes' (nods) The parrot's sitting on his head		A
8	AS	and the (..) and the (*unintelligible speech) (..) and the (..) (point) (.) (*unintelligible speech)	points to page	In
9	NS	you tell me when you want the page turning		I
10	AS	(*laughs) erm (.) erm (.) (*unintelligible speech)		NPC
11	NS	sorry?		QW
12	AS	(*unintelligible speech) (.) (point) (.) and the boy	points to page	In
13	NS	the boy (nods) <u>YEP</u>		A
14	AS	(*unintelligible speech)		In
15	NS	what's the boy got?		QW
16	AS	(*unintelligible speech) (..) (*unintelligible speech)		NPC
17	NS	is there anything to help here? (point)	points to device	I
18	AS		looks at device and moves hand to access it	RI
19	NS	what's the [boy got?]		QW
20	AS	[the boy]		RW
21	NS	yep		A
22	AS	and the (*unintelligible speech)		
23	NS	'yes' (nods)		A
24	AS	(continued from above) 'boy'		In
25	NS	the boy		A
26	AS	(*unintelligible speech) (.) (point)	points towards book	In

27	NS	what's the boy got?		QW
28	AS	(*unintelligible speech) (.) a cat		RW
29	NS	oh (point) (.) is there a cat there?	points to page	O QYN
30	AS	yeh	looks at NS	RY
31	NS	where?		QW
32	AS	(*unintelligible speech) tree		RW
33	NS	in the tree (.) but we haven't got to the tree yet		A Ex
34	AS	(*unintelligible speech) (.) yeh		RY
35	NS	yes what?		C
36	AS	(*unintelligible speech)		NPC
37	NS	turn the page?		QYN
38	AS		turns page	RY
39	NS	good boy		Pr
40	AS	oh		Co
41	NS	ah what's happening now?		A QW
42	AS	it's stuck		RW
43	NS	the (.) it's stuck		A
44	AS	[YEH]	smiles at NS	RY
45	NS	[what's] stuck?		QW
46	AS	and he (.) he's crying (.) Meow meow		In
47	NS	he's crying meow meow that's right (.) uh ooh		A Co
48	AS	oh dear		In
49	NS	it wants dinner? (.) oh dear (.) oh dear that's right is that what Peter's saying oh dear?		C A A QW
50	AS	(*unintelligible speech) and the boy he (*unintelligible speech) (.) climbed the tree	turns page	In
51	NS	'yes' (nods) he climbed up the tree		A
52	AS	and he (*unintelligible speech) (.) (*unintelligible speech) (point) (.) (*unintelligible speech) get the cat down	points to page	In
53	NS	he's going to get the cat		A
54	AS	(*unintelligible speech) (.)(*unintelligible speech)		NPC
55	NS	what happens next?		QW
56	AS	back down		RW
57	NS	back down? (.) do they they get (.) who's getting back down?		C QW
58	AS	(point) the cat	points to page	RW
59	NS	'yes' (nods) he's going to get the cat back down (.) well is that what happens?		A QYN
60	AS	[yeh]		RY

61	NS	[shall we] see (..) shall we see		Co I
62	AS		turns page	RI
63	NS	oh		Co
64	AS	the boy (..) get the cat (.)(*unintelligible speech)		In
65	NS	the cat's in the tree (.) who else is in the tree?		A QW
66	AS	the (.) the boy		RW
67	NS	'yes' (nods) the boy that's right (..) are they happy?		A QYN
68	AS	yeh		RY
69	NS	are they?		C
70	AS	yeh		RY
71	NS	Sure? (.) let's see (.) uh		O Co
72	AS	heeeelp	turns page	In
73	NS	help (.) why are they shouting help?		A QW
74	AS	scared		RW
75	NS	they're scared (.) I think they are		A Co
76	AS	the (.) the boy scared		In
77	NS	'yes' (nods) the boy is scared (.) what about the cat?		A QW
78	AS	(*unintelligible speech) (.) get down (.) (*unintelligible speech)		RW
79	NS	what happens next?		QW
80	AS	(*unintelligible speech) (.) (*unintelligible speech) (.) hello		RW
81	NS	who's he saying hello to?		QW
82	AS	(*unintelligible speech) the boy says hello (.) (*unintelligible speech)		RW
83	NS	what happens next?		QW
84	AS	the (.) the boy's scared		RW
85	NS	li's the boy's Dad is it?		C
86	AS	he scared		RN
87	NS	oh he's scared right (.) he is scared		A A
88	AS	(*unintelligible speech) the boy scared		In
89			*** Light goes out as researcher leans on switch!***	
90	NS		** (laughs)**	
91	AS		** (*unintelligible speech)**	
92	NS	shall we see what happens next?		QYN
93	AS		turns the page	RY
94	NS	uh		Co

95	AS	heeeeeelllp		In
96	NS	'yes' (nods) who's he shout help to? (.) who hears him?		A QW QW
97	AS	the man		RW
98	NS	the man (.) right what's the man doing?		A QW
99	AS	he was (.) shocked (..) he was shocked		RW
100	NS	he's shocked isn't he (.) yes he's shocked to hear the boy shout help	looks at book	A S
101	NS	what happens next?		QW
102	AS		turns page	
103	AS	(*unintelligible speech) a ladder		RW
104	NS	he takes his ladder (.) that's right (.) and what [do they do?]		A A QW
105	AS	[(*unintelligible speech)]	turns page	NPC
106	AS	thank you		In
107	NS	thank you (.) he's a very nice boy isn't he		A Co
108	AS	(*unintelligible speech) (.) the boy is (*unintelligible speech)		In
109	NS	the boy is?		C
110	AS	(*unintelligible speech)		In
111	NS	can you show me? (point)	points to device	I
112	AS	[maybe]		In
113	NS	[can you show me] there? (point)	points to device	I
114	AS	maybe the boy (..) maybe boy sad		In
115	NS	you think the boy is sad?		C
116	AS	oh no (.) oh no (.) what can he do? (*unintelligible speech)		In In
117	NS	what does he need to do?		QW
118	AS	Mummy (*unintelligible speech) [(*vocalisation)]		RW
119	NS	[what does] he need to do now? he needs to?		QW QC
120	AS	oh no (.) the boy is crying		In
121	NS	I don't think the boy is crying (.) look (point)	points to page	O I
122	AS	(*unintelligible speech) (.) happy		Ri In
123	NS	he's happy that's right (.) because he's down on the ground again isn't he		A Co
124	NS	uh (.) and he's got the cat safe (..) what happens next?		Co QW
125	AS		turns page	
126	NS	oh (..) who's he gone home to?		Co

				QW
127	AS	his mummy (point)	points to page	RW
128	NS	seeing his Mum that's right (.) what d'you think she's saying?		A
				QW
129	AS	the boy (*?sad)		RW
130	NS	he's sad?		C
131	AS	he's (*unintelligible speech)		RN
132	NS	he's glad?		C
133	AS	(*unintelligible speech)		In
134	NS	can you <u>SHOW ME</u> ?	nods head towards device	I
135	AS	(*unintelligible speech)	accesses device	RI
136	NS	can you show me (.) please		I
137	AS		accesses device	RI
138	NS	is it there?		QYN
139	AS	he's scared		In
140	NS	he's scared (.) but now he's home (point) (.) and what does Mum say?	points to page	A Co QW
141	AS	oh dear		RW
142	NS	oh dear (.) I was worried about you		A Co
143	AS	(*unintelligible speech)		In
144	NS	is she pleased he's home?		QYN
145	AS	(*unintelligible speech)		In
146	NS	more water?		C
147	AS	(*unintelligible speech)		In
148	NS	can I remember what?		QW
149	AS	the boy said		In
150	NS	what did the boy say?		QW
151	AS	the boy said (*unintelligible speech) (.)(*unintelligible speech)		RW
152	NS	can you show me (.) on your Dynavox? (point)	points to device	I
153	AS	(.) (*unintelligible speech)	accesses device	RI
154	NS	the boy		A
155	AS	(*unintelligible speech)		In
156	NS	is sad?		C
157	AS	no (*unintelligible speech) (.) uh oh (.) (*unintelligible speech)		RN In
158	NS	have we finished this story now?		QYN
159	AS	uh oh		Co
160	NS	is it finished now?		QYN
161	AS	no		RN
162	NS	no (.) how does it finish then?		A QW
163	AS	(*unintelligible speech)		NPC



164	NS	I think mum says (.) uh I'm glad to have you home (.) even with the cat		In
165	AS	(*unintelligible speech) (point)	points to page	In
166	NS	is that what she says?		QYN
167	AS	the boy (*unintelligible speech) (.) (*unintelligible speech)		In
168	NS	who's cross?		QW
169	AS	<u>ME</u> (point)	AS points to himself	RW
170	NS	you're cross?		C
171	AS	yeh		RY
172	NS	why?		QW
173	AS	(*unintelligible speech)		RW
174	NS	have we finished the story now?		QYN
175	AS	(*unintelligible speech)		In
176	NS	B can you tell me how the story finishes?	touches AS' hand	I
177	AS	Mummy (.) (*unintelligible speech) (.) (*unintelligible speech) the boy said	accesses device	RI In
178	NS	what did the boy say?		QW
179	AS	(.) a question	accesses device	RW
180	NS	go on then ask a question		I
181	AS	the boy said why (.) why (.) what are you doing here B		In QW In
182	NS	what are you doing here B? (.) why are you here?		A Co
183	AS	what are you doing here B?		In
184	NS	who's the boy talking to?		QW
185	AS	(*unintelligible speech)		NPC
186	NS	right I think we've finished the story haven't we (.) and I think we're having a chat now (.) is that right?		In C
187	AS	(*unintelligible speech)		In
188	NS	what about CM?		QW
189	AS	(*unintelligible speech)		RW
190	NS	right (.) I think we've finished the book haven't we (.) shall I close the book?		A I QYN
191	AS	FINISHED (*?thank you C)	takes book from NS and closes	RY
192	NS	thank you		A
193	NS	can you say the end (..) well done		I Pr

## Appendix C1.6

### Participant B: Session Three Personal Narrative - Pets

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	have you got a story		QYN
2	AS	<u>YEH</u> (nods)		RY
3	NS	to tell me about your animals		(cont.QYN)
4	AS	oh no (*unintelligible speech)		In
5	NS	(point) what can you tell me [about your animals?]	looks at AS and points to device	I QW
6	AS	[oh no]		In
7	NS	shall we have a [look at the words]	accesses device	I
8	AS	[( <i>*unintelligible speech</i> )] away		In
9	NS	she did run away	smiles and accesses device	A
10	AS	[( <i>*unintelligible speech</i> )]		In
11	NS	[here we are] (point) (.) what can you tell me about your pets?	points to device screen	Ex QW
12	NS	you tell me		I
13	AS		accesses device	RI
14	NS	what are you going to tell [me?]		QW
15	AS	[ <i>'pet</i> ] food'		RW
16	NS	what about pet food?		QW
17	AS	( <i>*unintelligible speech</i> )	accesses device	RW
18	NS	what sort of pets have you got B?		QW
19	AS	( <i>*vocalisation</i> )	covers device screen with hand	NPC
20	NS	what sort of pets have you got?		QW
21	AS	( <i>*unintelligible speech</i> )		RW
22	NS	what have you got?		QW
23	AS		accesses device	RW
24	NS	what's that?		QW
25	AS	<i>'pet food lead'</i> (...) ( <i>*unintelligible speech</i> )	looks at NS looks away looks at NS	RW In
26	NS	the dog?		C
27	AS	<u>MMM</u> (nods) (.) ( <i>*unintelligible speech</i> )		RY In

28	NS	'yes' (nods)		A
29	AS	(*unintelligible speech)		In
30	NS	why do we have to be quick?		QW
31	AS	(*unintelligible speech) coming to get me		RW
32	NS	the dog's coming to get you?		C
33	AS	yeh	looks at NS	RY
34	NS	what sort of a dog?		QW
35	AS	(*unintelligible speech) run away (..) (*unintelligible speech) help (.) help		In
36	NS	you shouting help help run away from the dog?		C
37	AS	YEH (nods)		RY
38	NS	oh why? (.) what's the dog going to do?		QW QW
39	AS	oh no (.) (*unintelligible speech) (..) B disappeared		RW In
40	NS	B's disappeared?		C
41	AS	yeh		RY
42	NS	uh (.) oh		A
43	AS	(*vocalisation) (.) B's sad		In
44	NS	B's sad		A
45	AS	oh no (.) (*unintelligible speech)		In
46	NS	the dog scared him?		C
47	AS	(nods) YEH		RY
48	NS	(nods) MMHMM		A
49	NS	what happens next?		QW
50	AS	(*unintelligible speech) (..) (*unintelligible speech)		RW
51	NS	who said sorry?		QW
52	AS	(*unintelligible speech) (.) me		RW
53	NS	you said sorry (.) oh (.) for because you scared everyone (.) because you disappeared?		A QYN
54	AS	(*vocalisation) (.) (*unintelligible speech) a monster (..) a monster		In
55	NS	what was the monster doing?		QW
56	AS	he (.) he get everyone		RW
57	NS	he's coming to get everyone?		C
58	AS	(nods) YEH		RY
59	NS	but you haven't got a monster as a pet have you?		QYN
60	AS	(*vocalisation) run away		In
61	NS	run away?		O
62	AS	oh no (.) quick (.) (*unintelligible speech)		In
63	NS	can you use this (point) (.) Then I can understand some more	points to device accesses device and	I Ex

			changes page	
64	AS	(*unintelligible speech) gone		In
65	NS	who's gone?		QW
66	AS	the children		RW
67	NS	the children've gone		A
68	AS	<u>YEH</u> (nods)		RY
69	NS	'yes' (nods) right		A
70	AS	(*unintelligible speech)		In
71	NS	where've they gone to?		QW
72	AS	go home		RW
73	NS	oh they've all gone home 'ok' (nods)		A
74	NS	so was it your dog that scared them?		QYN
75	AS	(*vocalisation) (.) be back tomorrow		In
76	NS	be back tomorrow?		C
77	AS	yeh		RY
78	NS	who will be back tomorrow?		QW
79	AS	the children		RW
80	NS	'yes' (nods) the children will come back tomorrow (..) where are they coming back to? (..) can you tell me? USE THIS	taps device with finger	A QW I
81	AS	oh no (.) (*unintelligible speech) the children LISTEN	puts hand to ear to gesture listening	In
82	NS	what are you li (.) doing? LISTEN?	copies AS' gesture, puts hand to ear	QW
83	AS	(*unintelligible speech) listening to the children		RW
84	NS	you were listening for the children		C
85	AS	LISTEN	puts hand to ear to gesture listening	
86	NS	What can you hear?		QW
87	AS	(*unintelligible speech) (.) (*unintelligible speech)		RW
88	NS	can you <u>USE YOUR DYNAVOX</u> to tell me what's happening?	taps device repeatedly with finger	I
89	AS	(*unintelligible speech)	moves hands towards device then chooses to speak	In
90	NS	'yes' (nods) can you <u>SHOW ME</u> ?	taps device with finger	I
91	AS	oh no (burps)	accesses device	RI In
92	NS	oh pardon you		Co
93	AS	oh no		In
94	NS	what do you say?		QW
95	AS	oh no		RW
96	NS	no you say pardon me		O

				Ex
97	AS	oh no		In
98	AS	(*unintelligible speech) my mummy (*unintelligible speech)		In
99	NS	right you've shown me the class (point) (.) what are the class doing?	points to device screen	Ex QW
100	AS	hello (*unintelligible speech) (.) (*unintelligible speech) (.) B (*unintelligible speech)		In
101	NS	right have we finished your story about pets?		QYN
102	AS	no (*unintelligible speech)		RN
103	NS	'ok' (nods) what are you going to tell me about the pets then?		A QW
104	AS	(*unintelligible speech)		RW
105	NS	(shakes head) 'no' now I'm not understanding you (.) I need you to <u>USE THIS</u> please	taps device with hand	Ex I
106	AS	oh no (.) oh no		In
107	NS	oh no what?		QW
108	AS	(*unintelligible speech) again (.) again		RW
109	NS	again (.) what?		QW
110	AS	(*unintelligible speech) coming to get you		RW
111	NS	who's coming to get you?		QW
112	AS	C		RW
113	NS	C?		C
114	AS	(*unintelligible speech) C (.) where are you? (*unintelligible speech)		In
115	NS	B we need you to use this so we can understand (point)	points to device	I Ex
116	AS	(.) mmm	accesses device	RI
117	NS	ok?		C
118	AS	alright C		RY
119	NS	right		A
120	AS	(*unintelligible speech) garden		In
121	NS	in the garden?		C
122	AS	yeh		RY
123	NS	what's happening in the garden?		QW
124	AS	(*unintelligible speech)		RW
125	NS	'yes' (nods) what are you going to tell me?		A QW
126	AS	oh no		RW
127	NS	oh no what?		QW
128	AS	what can (.) what can we do? (.) what we going to do?		RW
129	NS	what are we going to do about what?		QW

130	AS	(*unintelligible speech) do?		RW
131	NS	what about your pets?		QW
132	AS	Mummy (*unintelligible speech) (.) Mummy (.) mmm (..) oh no		In
133	NS	oh (.) is that the end of the story?		A QYN
134	AS	no (.) (*unintelligible speech) the children cry (.) and (.) and they're sad		RN In
135	NS	they're (.) the children are crying and they're sad?		C
136	AS	[yeh]		RY
137	NS	[well why?]		QW
138	AS	(*unintelligible speech) come back		RW
139	NS	they didn't want to come back? (.) where were they?		C QW
140	AS	(*vocalisation) (.) oh no (.) (*unintelligible speech) oh dear (.) (*unintelligible speech) (.) uh oh (*unintelligible speech)		In
141	NS	I wish you'd <u>USE THIS</u> so that you I can understand a bit more	taps device with hand	Co Ex
142	AS	(.) 'Mummy'	accesses device and moves between dynamic pages	In
143	NS	right what about Mummy?		A QW
144	AS	(*unintelligible speech)		RW
145	NS	well can you tell me that bit please (point)	points to device	I
146	AS	and	accesses device	RI
147	NS	yeh		A
148	AS	Daddy	accesses device	RI
149	NS	(nods) <u>RIGHT</u>		A
150	AS	'Mummy and Daddy'		RI
151	NS	yes but I can understand you when you say that (.) so what do Mummy and Daddy do?		A Ex QW
152	AS	erm (*unintelligible speech)		In
153	NS	so can you tell me something about the children?		QW
154	AS	(*unintelligible speech)		RW
155	NS	can you <u>TELL ME ON HERE</u> about the children (.) what are the children doing?	taps device with hand	I QW
156	AS	(*unintelligible speech)	accesses device	RW RI
157	NS	what are the children doing?		QW
158	AS	go home		RW
159	NS	'yes' (nods) they're going home		A

160	AS	(*unintelligible speech) come back (.) they didn't want (.) to come back (.) to school		In
161	NS	so which children?		QW
162	AS	where the children going?	accesses device	In
163	NS	(shakes head) 'no' the children are in class (..) B's (.) (shakes head) 'no' erm E's gone to swimming		O Ex
164	AS	(.) 'E'	accesses device	C
165	NS	(nods) <u>YEH</u>		RY
166	AS	(*unintelligible speech)		In
167	NS	what about E? (.) what are you going to tell me about E? <u>USE THIS</u>	nods head towards device	QW QW
168	AS	very happy		RW
169	NS	he's very happy?		C
170	AS	yeh		RY
171	NS	good (.) why's he very happy?		A QW
172	AS	(*unintelligible speech)		RW
173	NS	can you <u>TELL ME ON HERE</u> please? (..) E's happy because	taps device with hand	I QC
174	AS	(*unintelligible speech)		RC
175	NS	can you <u>TELL ME ON HERE?</u>	taps device with finger	I
176	AS	'C'	accesses device	RI
177	NS	<u>RIGHT</u> (nods) (.) and what about C?		A QW
178	AS	(*unintelligible speech) (.) [(*unintelligible speech)]		RW
179	NS	[can you <u>TELL ME ON HERE</u> ] (.) <u>TELL ME ON HERE</u>	taps device with hand nods head towards device	I I
180	AS	how (..) how (*unintelligible speech) (..) 'G'	accesses device	In RI
181	NS	what did you want to ask about [G?]		QW
182	AS	home (.) want to go [home]		RW
183	NS	[can you] <u>PUT IT ON HERE</u> please (..) 'yes' (nods) <u>ON HERE</u>	taps device with hand taps device with hand	I I
184	AS	'how?'		RI
185	NS	how what?		QW
186	AS	want (.) want (.) want to go home (*unintelligible speech)		RW
187	NS	how does C go home? (.) he goes		C QC

188	AS	after school club		RC
189	NS	'yes' (nods) after school club that's right (.) are you going to after school club today?		A QYN
190	AS	yeh		RY
191	NS	yeh good (.) so you're both going (.) and then your Mum's will come to pick you up (.) have we finished story telling now?		A Ex QYN
192	AS	yeh		RY
193	NS	yeh I think so (.) thank you (.) well done		A Co Pr



## Appendix C1.7

### Participant B: Session Four Fictional Narrative - The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	are you ready to tell me the story?		QYN
2	AS	yeh		RY
3	NS	yes (.) ok shall I turn the pages for you?		A
4	AS	[yeh]		RY
5	NS	[or will you turn the pages?]		QYN
6	NS	OK (..) right let's start from here shall we	opens book	A
7	AS	OK (point)	tries to turn page	R
8	NS	well (.) anything you wanna say about this?		A
9	AS	yeh		O
10	NS	what?		QYN
11	AS		tries to turn page	RY
12	NS	what do you want to say about this?		QW
13	AS	yeh	turns page	RY
14	NS	what does it say?		QW
15	AS	squirrel story	turns page back	RW
16	NS	'yes' (nods) squirrel story thank you		A
17	AS	(..) (point) (*unintelligible speech)	turns page points to page	In
18	NS	now you can use the words here to help you remember (point)	points to device screen	Ex I
19	AS		accesses device	RI
20	NS	make it nice and clear		Co
21	AS		accesses device	
22	AS	(*unintelligible speech)		In
23	NS	ok		A
24	AS	(*unintelligible speech) (..) (point) Mummy	points to page	In
25	NS	(nods) MMM		A
26	AS	(point) Mummy (.) squirrel	points to page	In
27	NS	'yes' (nods) Mummy squirrel 'yes' (nods)		A

28	AS	(point) and the baby squirrel	points to page	In
29	NS	and the baby squirrel		A
30	AS	(*unintelligible speech)	tries to turn page	In
31	NS		moves hand to assist AS to turn page	
32	AS	(*unintelligible speech)		NPC
33	NS	am I turning over?		QYN
34	AS	(*unintelligible speech) (.) Baby squirrel where are you? (.) (*unintelligible speech) come on (point) <u>TURN PAGE</u>	points to edge of page	In I
35	NS		turns page	RI
36	AS	Baby squirrel where are you?		In
37	NS	who's shouting where are you?		QW
38	AS	oh (.) oh no (.) oh no (.) (*unintelligible speech) the baby squirrel has disappeared (.) (*unintelligible speech) the garden		In
39	NS	he's in the garden (.) right (.) and what's he doing in the garden?		A QW
40	AS	(point) (* <u>UNINTELLIGIBLE SPEECH</u> ) the apples	points to page	RW
41	NS	eating the apples (.) good		A Pr
42	AS		turns page	
43	AS	(point) (*vocalisation) <u>HE ATE A LOTS AND LOTS</u>	points to page	In
44	NS	lots and lots		A
45	AS	apples		In
46	NS	lots and lots of apples		A
47	AS	(point) (*unintelligible speech) <u>THE BABY SQUIRREL</u> (*unintelligible speech)	points to character on page	In
48	NS	what about the baby squirrel?		QW
49	AS	he scared		RW
50	NS	he's scared? (.) why?		C QW
51	AS	because (.) oh no (.) oh no (.) the baby squirrel has disappeared (.) (*unintelligible speech) Mummy (.) (*unintelligible speech) Mummy		RW In
52	NS	call Mummy?		C
53	AS	(*unintelligible speech)		NPC
54	NS	what happens next?		QW
55	AS	<u>HELLO (.) BABY SQUIRREL HAS DISAPPEARED</u>	moves hand to ear to gesture being on the phone	RW
56	NS	Baby squirrel has disappeared?		C

57	AS	OH NO (.) (*UNINTELLIGIBLE SPEECH) THE GARDEN	continues to gesture being on the phone	In
58	NS	lost out of the garden?		C
59	AS	(*unintelligible speech)		In
60	NS	who are you phoning?		QW
61	AS	(*unintelligible speech) the Baby squirrel gone		In
62	NS		begins to turn page	
63	AS	(*unintelligible speech)		In
64	NS	B what happens next? (..) look (.) look at the story		AI QW I
65	AS	(point) OH (.) (point) the baby squirrel (*unintelligible speech) (.) is stuck	turns page points to page points to character on page	RI RW
66	NS	he's stuck		A
67	AS	oh no (.) I need you help		In
68	NS	I need your help (.) that's right		A A
69	AS	will you help me (.) push the Baby squirrel out again		In
70	NS	will you help me push the Baby squirrel out again 'yes' (nods) (.) [who's saying that?]		A QW
71	AS	[(*unintelligible speech)] (.) help (*unintelligible speech) to push (.) now push push push		In
72	NS	push push push		A
73	AS	oh oh dear (.) he still stuck		In
74	NS	oh dear (.) you are stuck		A
75	AS	Mummy (.) Mummy will help me (..) Mummy will help me		In
76	NS	Mummy will help me?		C
77	AS	yeh		RY
78	NS	right (.) Mummy's not here (.) who's here? (.) to help		O Ex QW
79	AS	(*unintelligible speech)		RW
80	NS	Mr		QC
81	AS	Daddy		RW
82	NS	Mr Badg		QC
83	AS	HIM (point)	points to character on page	RC
84	NS	Mr Badger (.) yeh		A
85	NS	what's Mr Badger going to do?		QW
86	AS	(*unintelligible speech) (.) oh look a worm (point)	points to page	In
87	NS	'yes' (nods) there's a worm (.) and what's the worm doing?		A QW
88	AS	in the apple		RW

89	NS	he's in the apple yes (.) and he's watching what's going on isn't it (.) wondering what's gonna happen (..) what happens?		A Co QW
90	AS	THAT (point) (*unintelligible speech)	turns page points to page	In
91	NS	uh what happens?		QW
92	AS	(*unintelligible speech) (.)(*unintelligible speech) (.) B (*unintelligible speech)		RW
93	NS	what happens here B? (point)	points to page	QW AI
94	AS	oh no (.) (point) the baby fly in the air	points to page	RW
95	NS	he is in the air isn't he (.) he's [flying]		A Co
96	AS	[(*unintelligible speech)]		NPC
97	NS	through the air		
98	AS	what happened		In
99	NS	how did that happen?		QW
100	AS	Oh no		In
101	NS	Mr Badger must have (.) done what?		QW
102	AS	I catch the baby squirrel (.) (*unintelligible speech) catch (.) catch the baby squirrel (.) catch catch the the baby squirrel		In
103	NS	catch the baby?		C
104	AS	yeh		RY
105	NS	catch the baby well (.) we can't catch the baby but who did catch the baby?		O Ex QW
106	AS	(*vocalisation)		
107	NS	who did catch the baby?		QW
108	AS	(*vocalisation) catch the baby squirrel		RW
109	NS	where did the baby land?		QW
110	AS	(*unintelligible speech) in the air		RW
111	NS	it's in the air (.) and it (.) FLIES through the air (.) and where does it land?	gestures flying with hands	A Co QW
112	AS	go (.) goes back [home]		RW
113	NS	[back] (.) home into the tree (.) that's right (.) uh that's a happy ending isn't it (.) back home with his mum		A A Co S
114	AS	THERE	touches page with hand	
115	NS	The fat baby squirrel		Co
116	AS		turns pages back and forward	
117	NS	well done (.) that's the end		Pr

				Ex
118	AS	the	takes book and closes	In
119	NS	[isn't it]		
120	AS	[end]		
121	NS	that's right (nods) well done (.) that's really good story-telling (.) thank you		A Pr Pr

## Appendix C1.8

### Participant B: Session Four Personal Narrative - First Day at School

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	alright (.) can you tell me about your first day at school (..) do you remember coming to [*school name]?		R I QYN
2	AS	(*unintelligible speech) (.) (*unintelligible speech)	looks at NS	NPC
3	NS	do you remember? (..) what can you tell me about your first day at school? <u>MAYBE IT WASN'T</u> [*SCHOOL NAME] (shakes head) (.) cos you went to another school didn't you		QYN QW Ex C
4	NS	can you remember your old school?		QYN
5	AS	yeh		RY
6	NS	yes (.) what was it like when you went there?		A QW
7	NS	what was it like when you went to your old school?		QW
8	AS	(*unintelligible speech)		RW
9	NS	what about the class? (..) is there anything here that will help you? (point)	points to device screen	QW I
10	AS		accesses device	RI
11	NS	how did you feel when you went to your new school?		QW
12	AS	'sad'	accesses device	RW
13	NS	you were sad? (..) when you went to your new school (..) or your old school?		C QCH
14	AS	(*vocalisation) old old School		RCH
15	NS	'yes' (nods) you were sad were you (.) and why were you sad?		A QW
16	AS	(*unintelligible speech) everyone (*unintelligible speech) me		RW
17	NS	everyone?		QC
18	AS	got cross		RC
19	NS	everyone got cross with you?		C

20	AS	yeh		Ry
21	NS	really		C
22	AS	[(*vocalisation)]		Ry
23	NS	[why were you] a bad boy?		QW
24	AS	sorry C		RW
25	NS	you're sorry (.) what are you sorry for?		A QW
26	AS	(*unintelligible speech)		In
27	NS	what else can you tell me about school?		QW
28	AS	I'm sad		RW
29	NS	you're sad?		C
30	AS	and scared		RW
31	NS	and scared? (.) you were sad and scared (.) right what were you scared of?		C A R QW
32	AS	(*unintelligible speech)		RW
33	NS	the work?		C
34	AS	YEH (nods)		Ry
35	NS	you were scared of the work?		C
36	AS	yeh		Ry
37	NS	why?		QW
38	AS	(*unintelligible speech)		NPC
39	NS	was it too easy or was it too hard?		QCH
40	AS	(*vocalisation) (..) B has to stop (.) B has to stop		In
41	NS	B has to stop what?		QW
42	AS	(*unintelligible speech) (..) (*unintelligible speech) (.) (*unintelligible speech)		RW
43	NS	who's got to stop?		QW
44	AS	C		RW
45	NS	yes but (..) oh was C at your school when you came to school? (.) was C here?		A QYN QYN
46	AS	(*unintelligible speech)		In
47	NS	was C in your class when you started [*school name]? (..) was he?		QYN C
48	AS	(nods slightly) 'yes'		Ry
49	NS	was it (.) who was your teacher when you started [*school name]? (..) who was your teacher?		QW QW
50	AS	(*vocalisation)		NPC
51	NS	who was your first teacher here?		QW
52	AS	B was scared		In
53	NS	B was scared		A
54	AS	(*unintelligible speech) cross		In

55	NS	who was cross?		QW
56	AS	<u>ME</u> (point)	AS points to himself	RW
57	NS	were you (.) why were you cross?		C QW
58	AS	with you		RW
59	NS	you were cross with me?		C
60	AS	yeh		RY
61	NS	but I wasn't here when you first came to [*school name]		O
62	AS	[(*vocalisation)] (.) (*unintelligible speech) (.) (*unintelligible speech)		In
63	NS	I'm not understanding B can you <u>USE YOUR DYNAVOX</u> to help	touches device with hand	Ex I
64	AS		accesses device	RI
65	NS	what are you going to tell me about when you came to school?		QW
66	AS		accesses device	RW
67	NS	[ok]		A
68	AS	[oh no]		In
69	NS	'yes' (nods) you're going to use (.) oh no what?		QW
70	AS	(*vocalisation) (..) (*unintelligible speech) very sad		RW
71	NS	you're very sad?		C
72	AS	(*vocalisation) (.) I'm very sorry it was me		In
73	NS	li was you?		C
74	AS	yeh		RY
75	NS	what was you?		QW
76	AS	(*unintelligible speech)		RW
77	NS	right can you <u>USE YOUR DYNAVOX</u> to help (point)	points to device	R I
78	AS		accesses device	RI
79	NS	why were you sad?		QW
80	AS	i'm going (.) i'm going (.) i'm going	looks at NS	In
81	NS	where are you going?		QW
82	AS	get help		RW
83	NS	to get help (.) what do you need help for?		A QW
84	AS	Mummy		RW
85	NS	right why does Mummy need help? (..) you're at school (.) you've come to a new school (..) you're telling me about your first day at school		A QW S
86	AS	(*unintelligible speech) (.) (*coughs)		NPC
87	NS	oh (.) got a bad cough?		QYN



88	AS	(*continues to cough)		
89	NS	Ddo you need a drink?		QYN
90	AS		yawns	
91	NS	B (.) would you like a drink?		Co QYN
92	AS	no thank you		RN
93	NS	ok (.) no		A
94	AS	(*unintelligible speech)		In
95	NS	you're not very well? (.) I think you're fine		C Co
96	AS	I've got a cough		In
97	NS	you've got a cough (.) yes but		A A
98	AS	(*attempts cough)		
99	NS	go on then you can cough		I
100	AS	(*coughs)		RI
101	NS	is that better?		QYN
102	AS	no		RN
103	NS	oh (.) would you like a drink?		A QW
104	AS	I can't (*unintelligible speech)		In
105	NS	you can't?		QC
106	AS	do it		RC
107	NS	do it (.) maybe you don't need to cough		A Ex
108	NS	Is that the end of our story about school? (.) you finished telling me about school?		QYN QYN
109	AS	no		RN
110	NS	pardon?		C
111	AS	no (.) no		RN
112	NS	no?		C
113	AS	the children there		In
114	NS	the children are there yes (.) did you make new friends when you came to school? (..) which children were in school?		A QYN QW
115	NS	who was in your class when you came to school?		QW
116	AS		yawns	
117	NS	B (.) that camera will fall in		Co
118	AS	(*vocalisation)	smiles at NS	
119	NS	what are you meant to do when you yawn like that?		QW
120	AS	I'm sorry		RW
121	NS	you're supposed to put your hand in front of your mouth		I
122	AS	(*unintelligible speech)		NPC
123	NS	have you finished telling me about school?		QYN
124	AS	(*vocalisation) (.) no		RN

125	NS	well what else are you going to tell me?		QW
126	AS	(*vocalisation) (.) oh no (*unintelligible speech)		RW
127	NS	can you <u>USE YOUR DYNAVOX</u> to tell me? (.) you were going to	touches device with hand	I Co
128	AS		accesses device	RI
129	NS	what were you going to tell me		QW
130	AS		accesses device	
131	NS	are they the words you wanted?		QYN
132	AS	(*unintelligible speech) 'right'		In
133	NS	these are the right words (..) what's right?		A QW
134	AS	C		RW
135	NS	C? (.) yes what about C?		A QW
136	AS	C is right		RW
137	NS	he's right (.) what's he right about?		A QW
138	AS	C (*unintelligible speech) wrong (..) C is wrong	accesses device	RW
139	NS	he's wrong (.) when is he wrong?		A QW
140	AS	'wrong'		Rep
141	NS	'yes' (nods) when's C wrong?		A QW
142	AS	I don't know		RW
143	NS	you don't know (.) Is he wrong when he makes a lot of noise?		A QYN
144	AS	B (*unintelligible speech) B was scared (.) I was scared		In
145	NS	you were scared		C
146	AS	yeh		RY
147	NS	B was scared (.) of C		S
148	AS	C C (.) what can I do?		In
149	NS	what can you do?		C
150	AS	C didn't know		In
151	NS	what didn't he know? (.) C didn't know (..) what to do 'no' (shakes head)		QW Co
152	AS	(*vocalisation) (..) (*unintelligible speech) C (*UNINTELLIGIBLE SPEECH)	makes a gesture with both arms straight out in front	In
153	AS	pull		In
154	NS	pull? (.) who's pulling?		C QW
155	AS	C		RW
156	NS	C was pulling (.) who was he pulling?		A QW

157	AS	go backwards (.) go backwards		In
158	NS	was he pulling you back		QYN
159	AS	yeh		RY
160	NS	right (..) oh (.) and did it scare you?		A QYN
161	AS	erm (..)(*unintelligible speech) stop		In
162	NS	did you say stop?		QYN
163	AS	C (..) C (*unintelligible speech)		In
164	NS	what's C doing?		QW
165	AS	(*unintelligible speech)		RW
166	NS	can you <u>TELL ME USING YOUR DYNAVOX</u>	taps device with hand	I
167	AS	[C]		In
168	NS	[what's C doing] (.) what's he doing?		QW QW
169	AS	he run away		RW
170	NS	he's running away		A
171	AS	(*unintelligible speech) (.)(*unintelligible speech)		NPC
172	NS	and did all this happen on your first day at school? 'yes?' (nods)		QYN
173	AS	get C stop (..) but C didn't stop		In
174	NS	what's C doing?		QW
175	AS	he didn't stop		RW
176	NS	he didn't stop (.) what was he doing?		A QW
177	AS	he run faster and faster		RW
178	NS	he ran faster and faster		A
179	AS	(*vocalisation) (*unintelligible speech) stop		In
180	NS	who was saying to him to stop?		QW
181	AS	(*unintelligible speech) (.)(*unintelligible speech) help help (.) (*unintelligible speech) C		In
182	NS	so how did they stop C?		QW
183	AS	crash (*unintelligible speech)	AS laughs while speaking	RW
184	NS	I haven't got the joke (.) what's so funny?		Ex QW
185	AS	(*unintelligible speech) (.) C (.) (*unintelligible speech)	AS continues to laugh whilst speaking	In
186	NS	what's so funny?		QW
187	AS	[C (*unintelligible speech)]		RW
188	NS	[ <u>TELL ME USING YOUR DYNAVOX</u> (.) tell me	taps device with hand	I
189	AS	(..) I can (.) see	accesses device and moves between dynamic pages	RI
190	NS	you can see what?		QW

191	AS	C		RW
192	NS	you can see C (nods)		A
193	AS	yeh		RY
194	NS	ah but you didn't make it say that (point)	points to device	I
195	AS	'I can see'	accesses device	RI
196	NS	ah (.) I can see C (..) and what's he doing?		A QW
197	AS	(*vocalisation) C shout (.) oh no (.) oh no (*vocalisation) help		RW
198	NS	he's shouting oh no help?		C
199	NS	and is		
200	AS	(*unintelligible speech) (.) crash in the water (.) (*unintelligible speech)		In
201	NS	are they in the water? LOOK	leans forward	QYN
202	AS	yeh		RY
203	NS	and what are they doing in the water?		QW
204	AS	splash		RW
205	NS	they're splashing?		C
206	AS	yeh		RY
207	NS	RIGHT (nods) (.) but you I [don't]		A
208	AS	[he] tumbled		In
209	NS	he tumbled in the water		Co
210	AS	and rumbled (.) tumbled and rumbled		In
211	NS	he tumbled and rumbled?		C
212	AS	in the water		In
213	NS	into the water? (.) are you writing poems?		C Co
214	AS	(*unintelligible speech)		NPC
215	NS	and how did it end?		QW
216	AS	(*vocalisation)		
217	NS	what happened at the end? 'no' (shakes head)		QW
218	AS	C (.) was scared (..) C was (.) scared		RW
219	NS	he was scared (.) what was he scared of?		A QW
220	AS	(*unintelligible speech) (.) he was scared (.) C (.) what can I do (.) what can I do		In
221	NS	what can you do? (.) you can get out of that water and you can get dry 'yes' (nods) (.) it's time to go home		QW In
222	AS	[(*unintelligible speech)]		In
223	NS	[you're supposed] to be in school		In
224	AS	PULL BACKWARDS	moves hand toward	In

			wheelchair controls and turns on controls	
225	NS	backwards? (.) no I don't think you need to go anywhere (..) can you switch it off please?		C O I
226	AS		switches off controls	RI
227	NS	thank you (.) cos we're just staying here		A Ex
228	NS	oh (.) that was an exciting story (..) IT'S FINISHED (sighs)		Co
229	AS	(*unintelligible speech)		In
230	NS	are we back at school now?		QYN
231	AS	C says (..) thank you B (.) thank you		In
232	NS	thank you (..) he said thank you to Br for helping (.) <u>IS THAT RIGHT?</u>	leans forward and tries to gain eye contact	A C
233	AS	(*unintelligible speech) B (*unintelligible speech)		In
234	NS	B?		C
235	AS	(repeats *unintelligible speech)		In
236	NS	packed your bag?		QYN
237	AS	(repeats *unintelligible speech)		In
238	NS	<u>TELL ME HERE</u>	taps Dynavox with hand	I
239	AS		accesses Dynavox and changes pages	RI
240	AS	'bedroom'		In
241	NS	ah (.) time to go to bed (.) is that right?		A C
242	AS	[(*unintelligible speech)]		NPC
243	NS	[right] (.) it's time to go to bed (..) and did B and C go to bed?		A QYN
244	AS	C (.)(*unintelligible speech)		In
245	NS	did he go back to his house?		QYN
246	AS	goodbye B		In
247	NS	oh C said goodbye B (.) and what did B say?		A QW
248	AS	and (.) (*vocalisation) goodbye C		RW
249	NS	(nods) 'yes' (.) it's time for		QC
250	AS	bed		RC
251	NS	time for bed (.) is that right? (..) and B went to sleep		A C In
252	AS	and B didn't want to wake		In
253	NS	he didn't want to?		QC
254	AS	to wake		RC
255	NS	didn't want to?		QC
256	AS	wake wake		RC
257	NS	wake up		A

258	AS	wake (..) (*unintelligible speech)		A
259	NS	<u>LISTEN</u> (.) you're supposed to be telling me about your first day at school (.) we're not supposed to be writing a huge long story right now	touches AS' arm	I Ex
260	NS	that was a lovely adventure (..) can we [stop]		Co QYN
261	AS	[(*unintelligible speech)]		In
262	NS	pardon? (.) don't wear yourself out because you've got another story to tell me (..) ALRIGHT?	looks to gain eye contact	QW Ex C
263	AS	my Daddy (.) my Daddy (..) my (.) my Daddy	gives eye contact	In
264	NS	what about Dad?		QW
265	AS	(*unintelligible speech) B goodbye (.) goodbye (.) my friend (..) goodbye my friend		In
266	NS	goodbye?		C
267	AS	goodbye my friend		In
268	NS	put that on here for me (point)	points to device	I
269	AS		accesses device	RI
270	NS	because I'm not understanding (.) goodbye (..) who?		Ex QW
271	AS	(..) 'goodbye'	accesses device and changes pages	RW
272	NS	yeh (.) goodbye who? (..) who are you saying goodbye to?		A QW QW
273	AS	(...) good bye my friend	accesses device and changes pages	RW
274	NS	my friends? (.) is that what you're saying?		C QYN
275	AS	(*unintelligible speech)(.) (*unintelligible speech) goodbye goodbye B		In
276	NS	goodbye B everyone says 'yes' (nods) (..) so did you say goodbye everyone?		A QYN
277	AS	(*vocalisation) I'll be back later (.) I'll be be back [later]		In
278	NS	['yes' (nods) you'll] be back later that's right		A
279	AS	bye bye		In
280	NS	yeh		A
281	AS	(*unintelligible speech) (.) goodbye		In
282	NS	'yes' (nods) goodbye (.) ok		A
283	AS	C said goodbye		In
284	NS	goodbye B		A
285	AS	goodbye C		In

286	NS	goodbye B		A
287	AS	B (*unintelligible speech)		In
288	NS	poor B it's time to stop (.) yes? (..) have we finished the story?		Co C QYN
289	AS	no (..) B (*unintelligible speech)		RN In
290	NS	now listen (.) you're supposed to be telling me about (.) going to school (..) you told me about going to school and being scared (.) being scared of C (.) and now you're telling me a long story (.) <u>THAT WASN'T WHAT I ASKED FOR</u> (shakes head) (.) I just wanted to hear about going to school (.) because in a minute I'm going to ask you to tell me another story about a squirrel (..) ok?		I Ex S Ex C
291	AS	ok		RY
292	NS	'ok' (nods) so can we stop this story now?		A C
293	AS	no (.) (*unintelligible speech)		RN
294	NS	it needs to finish (.) it needs to finish		I I
295	AS	(*unintelligible speech) (.) B was scared (.) I was scared (.) I scared		In
296	NS	what are you scared of?		QW
297	AS	(*unintelligible speech) no (.) no (.) help (.) help (.) help (.) help		In
298	NS	and how did it finish?		QW
299	AS	(*unintelligible speech)	accesses device	RW
300	NS	go on then (.) if you're looking for a word see if you can find it		I
301	AS	'goodbye'		RW
302	NS	ah everyone said goodbye (.) and is that the <u>FINISH</u> /end?	uses makaton sign for 'finish'	A QYN
303	AS		looks away from NS	
304	NS	that is the end (..) well done (.) well done (.) that was really good story telling		Ex Pr Pr

## Appendix C2

### Participant B – Linguistic Move-Type

Linguistic Move-Type	Session															
	1			2			3			4						
	Personal AS	Fictional NS	AS	Personal NS	Fictional AS	NS	Personal AS	Fictional NS	AS	Personal AS	Fictional NS	AS				
Ready	0	2	0	0	0	1	0	0	0	0	2	0	0	3	0	1
Instruct	0	12	0	0	0	0	0	0	17	0	14	0	0	18	1	2
Explain	0	3	0	1	0	1	0	0	10	0	1	0	0	11	0	4
Inform	7	0	20	0	16	0	36	0	0	39	2	57	3	28	0	0
Check	0	11	0	0	13	0	1	15	0	0	12	0	34	0	6	0
Align	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Query-YN	0	14	0	16	1	16	0	8	0	0	12	0	30	0	5	0
Query-W	3	16	0	23	0	30	0	46	1	36	1	62	0	23	0	0
Query-Choice	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0
Query-Completion	0	2	0	0	11	0	0	2	0	0	1	0	5	0	2	0
Request help	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acknowledge	1	24	0	46	0	30	0	23	0	37	1	45	1	25	0	0
Object	0	0	0	1	0	0	0	3	0	3	0	2	0	3	0	0
Reply-Y	26	0	9	0	22	0	15	1	10	0	0	14	0	6	0	0
Reply-N	0	0	2	0	0	0	5	0	4	0	0	7	0	0	0	0
Reply-W	11	3	22	0	14	0	34	0	25	0	37	1	45	1	25	0
Response to instruction	6	0	1	0	4	0	10	0	7	0	10	0	2	1	0	0
Reply-Choice	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Reply-Completion	2	0	9	0	8	0	2	0	0	0	0	5	0	1	0	0
Clarify	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Praise	0	6	0	2	0	4	0	1	0	0	2	0	2	0	4	0
Comment	1	3	0	6	1	16	0	3	2	13	0	10	0	6	0	0
Summarise	0	3	0	1	0	0	0	0	0	1	0	3	0	1	0	0
Repetition	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Operation of device-Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NPC	2	0	0	0	13	0	1	0	7	0	0	0	3	0	0	0
<b>Total Preparation Moves</b>	0	2	0	1	0	2	0	0	0	0	2	0	3	0	1	0
<b>Total Initiation Moves</b>	10	58	20	60	18	81	16	14	37	98	40	78	57	165	29	44
<b>Total Response Moves</b>	47	39	43	56	50	50	11	32	66	31	48	56	75	62	24	40
<b>Total Coded Moves</b>	59	99	63	117	81	133	27	47	104	129	96	136	133	230	56	85

Frequency of Linguistic Move-Type use for each data collection session according to narrative type



## Appendix C3

### Participant B - Communicative Modality

Communicative Modality	Session															
	1				2				3				4			
	Personal		Fictional		Personal		Fictional		Personal		Fictional		Personal		Fictional	
	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS
Speech	18	17	13	12	13	20	10	5	26	19	32	22	47	41	20	10
Vocal Gesture	1	0	5	2	1	0	0	0	1	0	0	2	4	0	1	0
Co-Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AAC-Encoding	8	0	2	0	4	1	1	0	8	1	1	0	15	0	1	0
AAC-Output	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Eye Gaze - Person	17	38	10	41	5	46	5	34	42	90	33	86	54	159	20	49
Eye Gaze - Device	15	11	17	14	19	11	2	1	37	31	12	14	35	23	6	4
Eye Gaze - Other	16	4	45	21	37	2	34	10	0	0	42	19	1	0	20	19
Facial & Body Gesture	2	9	2	0	1	4	0	1	1	2	5	5	2	5	3	1
Sign	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0
Env. Reference	1	0	14	6	0	2	11	11	1	1	2	0	0	0	3	2
Neutral	7	0	0	0	0	0	3	0	18	0	10	0	57	0	7	0
NPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Coded Instances</b>	85	79	108	97	80	86	66	62	137	144	137	148	215	228	81	85
<b>Total Communicative Acts</b>	78	79	108	97	80	86	63	62	119	144	127	148	158	228	74	85

Frequency of Communicative Modality use for each data collection session according to narrative type

## Appendix C4.1

### Participant S: Session One Fictional Narrative – The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	I want you (.) to see if you can tell me some bits about that story (.) can you tell me the story of the squirrel (.) and the apple trees (.) and his friends		I I
2	AS		tries to access device	
3	NS	its got to wake up hasn't it (..) that's it (.) it's waking up slowly but surely		Co Co
4	AS		accesses device	
5	NS	(*vocalisation) (.) you might wanna go in objects first		Ex
6	NS	can you see the objects page?		QYN
7	AS		accesses device and highlights objects page	RY
8	NS	(*coughs) good girl		Pr
9	AS		hovers eye gaze on button for 'objects' page	
10	NS	ooh nearly (.) little bit longer		A Ex
11	AS		accesses device and changes page	RI
12	NS	yay (.) well done so		A Pr
13	AS		looks around page and highlights button marked 'squirrel'	
14	NS	ah ok		A
15	AS	'squirrel'		RI
16	NS	'yes' (nods) squirrel (.) yep		A
17	AS	'sun'		RI
18	NS	and it was sunny (.) it was sunny		A
19	AS	'mummy squirrel'		RI
20	NS	mummy squirrel (.) where were they?		A QW
21	AS	'forest'		RW

22	NS	they were in the forest weren't they (.) cos they were up a tree weren't they		A Co
23	AS		accesses device and changes page	
24	NS	oh you gonna go have a look see what else there is		Co
25	AS		accesses device and highlights a button	
26	NS	ahh (.) so what's next? (.) (*laughs)		A QW
27	AS	'fence'		RW
28	NS	the fence (.) who was at the fence then?		A
29	AS		accesses device and looks around screen	
30	NS	if you wanna go back to the previous page it's that one isn't it (point)	points to device screen	Ex
31	AS		tries to access button	
32	NS	little bit longer S you're doing really well (..) trying to get that mouse weren't you		Ex Pr Co
33	AS		accesses device and selects button	
34	NS	oh [mouse]		A
35	AS	[ <i>'mouse'</i> ]		RW
36	NS	anybody else? (.) who else was in the story?		QYN QW
37	AS		accesses device and hovers eye gaze over an unwanted button	
38	NS	ah ah		I
39	AS		looks away quickly	RI
40	NS	(*laughs) good girl		Pr
41	NS	when you're ready (.) who else was in that story? that's on this on this page		Ex QW
42	NS	so mouse was at the fence (.) who else?		S QW
43	AS		sits up and starts to access device	
44	NS	good girl		Pr
45	AS	(*vocalisation)	leans forward and struggles to access device	In
46	NS	(point) because there (.) you've got a big cross (.) because you've sat forward a little bit	points to device screen	Ex
47	AS		looks at NS	

48	NS	you need to sit back a little bit		I
49	AS		sits back	RI
50	NS	good girl that's it well done		Pr
51	AS		accesses device and highlights a button with eye gaze	
52	NS	(nods) <u>YEH</u> (*laughs)		A
53	AS		moves gaze away from selected button just as it is about to be selected	
54	NS	oh unlucky		A
55	AS	(*vocalisation) (.) 'badger'		RW
56	NS	the badger (.) he did come didn't he (.) he came along to help didn't he		A In
57	AS	'rabbit'		RW
58	NS	and rabbit (.) anybody else? that is that all of them?		A QYN QYN
59	NS	what were they doing? (..) can you remember?		QW QYN
60	AS		looks at NS	RH
61	NS	what were they doing?		QW
62	NS	what did they <u>SEE</u> (.) on the other side of the <u>FENCE</u> ?	uses Makaton sign for 'see' uses a gesture to indicate the 'fence'	QW
63	NS	was it a (.) <u>APPLE</u> ?	uses Makaton sign for 'apple'	QYN
64	AS		looks back to device	
65	NS	can you find that?		QYN
66	AS		accesses device	
67	NS	good girl		Pr
68	AS		looks at NS	RH
69	NS	tired (..) tired?		QYN
70	AS	'yes' (nods)		RY
71	NS	are you happy to carry on for (.) another few minutes?		QYN
72	AS	'no' (shakes head)		RN
73	NS	no had enough		A C
74	AS	'yes' (nods)		RY
75	NS	yeh you need to stop		A
76	NS	that's fine (.) so we already had mummy squirrel and baby squirrel (.) they were up the tree in the forest (.) and we know there was a fence (.) and we know there was a mouse and badger and rabbit (.) well done		A S Pr

77	NS	you remembered the key bits of that story didn't you (.) you told me the key (.) key characters in that story didn't you		Co
78	NS	well done (.) well done S		Pr Pr

## Appendix C4.2

### Participant S: Session One Personal Narrative – A Christmas

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	what do you wanna tell me about your Christmas?		QW
2	NS	(point) so you need to get your green face	points at device screen	Ex
3	AS		sits up and holds better posture for eye gaze device	
4	NS	good girl		Pr
5	AS	(*vocalisation)	accesses device and changes page	RW
6	NS	oooh (.) (point) that's a funny one for that	points at specific button on device screen	Co
7	AS	'unwrap'	selects the button NS pointed to	In
8	NS	unwrap (.) was you expecting that?	looks at AS	A QYN
9	NS	(*laughs)		
10	AS		looks at NS	
11	NS	I wasn't expecting that		Co
12	AS	'no' (shakes head)	looks at NS	RN
13	NS	no (.) so was that the one you wanted? unwrap (.) what did you unwrap?		A QYN QW
14	AS	(*vocalisation)		RW
15	NS	mmm (.) did you want that one or not?		A QYN
16	AS	'yes' (nods)	holds eye contact	RY
17	NS	YEH (nods) (..) so (.) you might need to <u>GO TO A DIFFERENT PAGE</u>	gestures to device screen	A Ex
18	NS	do you think your object page might have (.) what you might have unwrapped?		I
19	AS		looks towards device	
20	NS	are you looking for a <u>PRESENT</u> ?	NS gestures unwrapping a present	QYN
21	AS		looks at NS	
22	NS	looking for <u>PRESENT</u> ?	NS gestures unwrapping a present	QYN

23	AS	(*VOCALISATION) (nods)		RY
24	NS	have a look on your object page (.) see if you can find it on there		I
25	NS	you need to go back first (point)	points to device screen	I
26	AS		accesses device and finds correct symbol	RI
27	NS	good girl (.) well done	looks at AS	Pr Pr
28	NS	so go on the blue one there (point)	points to device screen	I
29	AS		accesses correct button and changes page	RI
30	NS	that's it		A
31	AS		AS highlights object page button	
32	NS	<u>THAT'S IT</u> (nods)		A
33	AS		accesses device and changes page	RI
34	NS	brilliant (.) ah I can see it (.) can you see it? (.) can you see presents?	leans over and looks at screen	Pr Co QYN QYN
35	AS		looks around device screen	
36	NS	you're having a good look aren't you		Co
37	AS	'presents'	pronounced incorrectly	RY
38	NS	presents oh it presents does it	looks at AS then screen	A Co
39	NS	so If you want it to say the whole thing you need to (point) (..) go to speak don't you	points to device screen	Ex
40	AS	'unwrap presents'		RW
41	NS	ah you unwrapped your presents (.) did you		A
42	AS		looks at NS	
43	NS	who was there?		QW
44	AS	[(*vocalisation)]		
45	NS	did you sit and unwrap them on your own? 'no' (shakes head) (.) [ya didn't did ya]		QYN Co
46	AS	[*(VOCALISATION)] (shakes head)		RN
47	NS	so can you remember where the (.) those family things were?		QYN
48	NS	(point) I think (..) if you [go]	points to device	I

49	AS	[(*VOCALISATION)] (nods strongly)	looks at NS while nodding	RY
50	NS	you can (.) go on then (.) go back then	removes hand from device	A I I
51	NS	or were they on the more objects? (.) you know I can't remember myself now		Co Co
52	AS	(*vocalisation)	accesses device and changes page	RY
53	NS	they might've been I can't remember (.) if they're on more objects or in descriptions		Co
54	NS	(*laughs) I'm not much help am I	looks at AS	Co
55	AS		accesses device and changes page	
56	NS	where are you going? (.) are you going back to your main page?		QW QYN
57	AS		looks at NS	RY
58	NS	d'you wanna to know a short cut		QYN
59	AS	'yes' (nods)		RY
60	NS	if you go to that one (point) (.) that will take you to your top page	points at device screen	Ex
61	NS	are you looking for your family page?		QYN
62	AS	'yes' (nods)	gives eye contact	RY
63	NS	ok (.) go on then		A I
64	AS	(*vocalisation)	gives eye contact	
65	NS	(point) <u>ME</u> ?	points to self	QYN
66	AS	'no' (shakes head)		RN
67	NS	no (.) you're looking for your family page (.) is that right?		A QYN
68	AS	'yes' (nods)		RY
69	NS	'yes' (nods) mm		A
70	AS	[(*vocalisation)]		
71	NS	[so if on erm] (.) on every page you'll have this (point)	points to device screen	Ex
72	NS	and that will take you to your main page (point) (.) so if you choose that little house	points to device screen	Ex I
73	AS	(*vocalisation)	accesses device and changes page	RI
74	NS	right now (.) (point) it's a case of finding your family (.) ah (.) are they in your quick talk?	points to device screen	A Co QYN



75	AS		accesses device	
76	NS	that's it		A
77	AS	(*vocalisation)		Co
78	NS	it's because you've lost your green face		Ex
79	AS		accesses device and changes page	RI
80	NS	good girl (..) no (.) not in there is it		Pr Co
81	AS		accesses device and changes page	RI
82	NS	well done (.) well remembered (..) where's your people gone?		Pr QW
83	AS	(*vocalisation)		In
84	NS	oh is it in about me? (point) (.) are they in there? d'you think they might be in there?	points to device screen	QYN QYN QYN
85	AS	(*VOCALISATION) (nods)	gives eye contact	RY
86	NS	yeh		C
87	AS	'yes' (nods)		RY
88	NS	think so (.) yeh have a lo (.) well have a little look then		A I
89	AS	(.) 'my brother is called D'	accesses device and changes page	RI
90	NS	ah was your brother there on Christmas Day?		QYN
91	AS	(nods) (*VOCALISATION)	gives eye contact	RY
92	NS	yeh (.) so did you unwrap presents with your brother?		A QYN
93	AS	'no' (shakes head)		RN
94	NS	or did he come <u>LATER</u> ?	gestures later by moving index finger to the right	QYN
95	NS	<u>WAS HE THERE IN THE MORNING (.) OR DID HE COME LATER</u>	holds up a hand to represent each choice	QCH
96	AS		looks at hand representing morning	RCH
97	NS	he was there in the morning (.) did he still live at home at Christmas?		QYN
98	AS	'yes' (slight nod)		RY
99	NS	yeh		A
100	AS	(*vocalisation)		
101	NS	ah (.) was there any body else?		QYN
102	AS		accesses device	
103	NS	you're having a good look aren't you		Co
104	AS		accesses device and changes page	

105	NS	ok		A
106	AS	(*vocalisation)	accesses device and changes page	Co
107	NS	did you (.) you didn't wanna do that did you?		QYN
108	AS	'no' (shakes head)	gives eye contact	RN
109	NS	no (.) ok you did well to get yourself back (.) good girl		A Pr Pr
110	NS	so what are we looking for?		QW
111	AS	(*vocalisation)		
112	NS	(point) so you've got Mum and you've got your Dad	points to device screen	Ex
113	NS	we haven't got your photos in here yet have we (.) we need to get your Mum to take some up to date photos don't we		Co Co
114	AS	(*vocalisation)		
115	NS	that your Mum? (.) Mum		QW C
116	AS	(*vocalisation)		RN
117	NS	no (.) Is she still doing that computer course your Mum? (.) Is it finished?		A QYN QYN
118	AS	'yes' (nods)		RY
119	NS	so she can take photos now can't she and put them on a <u>LITTLE</u> stick?	gestures 'little' with both hands	QYN
120	AS	'yes' (nods)		RY
121	NS	shall I <u>WRITE</u> that in my book?	gestures 'write' by mimicking writing with right hand	QYN
122	AS	(*VOCALISATION) (smiles and nods)		RY
123	NS	yeh (*laughs)		A
124	AS	(*vocalisation)		RH
125	NS	do you want some help?		QYN
126	AS	'yes' (nods)		RY
127	NS	do you need some help?		QYN
128	AS	'yes' (nods)		RY
129	NS	right ok (.) where do you wanna go? (.) back to the story?		A QW QYN
130	NS	<u>BACK TO THE STORY OR SOMEWHERE ELSE?</u>	holds up a hand to represent each choice	QCH
131	AS		looks at hand for somewhere else	RCH
132	NS	somewhere else (.) do you want to go (.) give me a clue		A QW
133	AS		looks at device screen and hovers in	RW

			one area of the screen	
134	NS	that says My Dad (point)	points to device screen	Ex
135			**two people walk in NS asks them to be quiet and leave **	
136	NS	head up S (..) (point) that says my Dad (.) and that says my Mum	points to device screen	I Ex
137	NS	(point) up there you've got you unwrap presents with your brother D (..) anybody else?	points to top of screen	S QYN
138	AS	(*vocalisation)	gives eye contact	RY
139	NS	yeh (.) Is it Mum? (point)	points to specific button on the screen	A QYN
140	AS	(nods) (*VOCALISATION)	gives eye contact	RY
141	NS	do you want some help?		QYN
142	AS	'yes' (nods)		RY
143	NS	you want <u>ME</u> to select it? (point)	points to self	C
144	AS	'yes' (nods)		RY
145	NS	ok ' <i>my mum is called</i> ' (.) oh we haven't filled it in yet (.) but your Mum	accesses device	A Co A
146	AS		accesses device	
147	NS	oh nearly (.) have another go (..) it's cos you've leant forward a little bit haven't you		A I Ex
148	AS		sits up	
149	NS	good girl (.) now see where the dot is (point) (.) that's where it's picking up your eyes	points to specific area of device screen	Pr Ex
150	AS		accesses device and selects button	
151	NS	brilliant		Pr
152	AS	' <i>my Mum is called my Dad is called</i> '		RW
153	NS	me mum me Dad (.) me Mum me Dad		Co
154	NS	so there was you (.) your <u>BROTHER D</u> (.) <u>YOUR MUM</u> (.) and <u>YOUR DAD</u> (.) yeh?	points to a finger to represent each person	S C
155	AS	(*vocalisation)		NPC
156	NS	anybody else?		QYN
157	AS	'yes' (nods)		RY
158	NS	yes (.) oh blimey		A Co
159	AS	(*vocalisation)		NPC
160	NS	I bet they're not on <u>THERE</u>	gestures towards	QYN

		are they	device with hand	
161	AS	(*vocalisation)		NPC
162	NS	was there		
163	AS	(*vocalisation)		NPC
164	NS	<u>WERE THESE FRIENDS OR FAMILY</u>	holds up hand to represent each choice	QCH
165	AS		looks to hand representing family	RCH
166	NS	so there was more family (.) Mum's Mum so your Nan?		A QYN
167	AS	IN HEAVEN	looks up	RN
168	NS	IN HEAVEN ok not your Mum's Mum what about your Dad's Mum	gestures up with hand	A QYN
169	AS	IN HEAVEN	looks up	RN
170	NS	'no' (shakes head) so you haven't got any Nannies left (.) What about Grandad's?		A QYN
171	AS	'yes' (nods)		RY
172	NS	got any Grandad's left?		C
173	AS	'yes' (nods)		RY
174	NS	yeh		A
175	AS	'yes' (nods)		RY
176	NS	were they there		QYN
177	AS	'no' (shakes head)		RN
178	NS	no		A
179	AS	(*vocalisation)		NPC
180	NS	so (.) try again		I
181	AS	(*vocalisation)		RI
182	NS	something to do with Mum? (.) Mum's family?		QYN QYN
183	AS	(*VOCALISATION) (shakes head)		RN
184	NS	Mum's family?		C
185	AS	(*VOCALISATION) (shakes head)		RN
186	NS	no		A
187	AS	(*vocalisation)		NPC
188	NS	Dad's family?		QYN
189	AS	'yes' (nods)		RY
190	NS	err (.) was it (.) oh has Dad got any brothers?		QYN
191	AS	'yes' (nods)		RY
192	NS	was your uncle there?		QYN
193	AS	(smiles and nods) (*VOCALISATION)		RY
194	NS	ah (.) your Uncle and your Aunty or just your Uncle? (.)		A

		<u>UNCLE AND AUNTY (.)</u> <u>JUST YOUR UNCLE</u>	holds up hand to represent each choice	QCH
195	AS		looks at hand representing just Uncle	RCH
196	NS	(*coughs) just your uncle		A
197	AS	(*vocalisation)		
198	NS	has he not got a wife? is he married?		QYN QYN
199	AS	(*vocalisation)		RY
200	NS	no or		
201	AS	'yes' (nods)		RY
202	NS	yes (.) yes he has (.) but she wasn't there on Christmas morning		A A C
203	AS	'yes' (nods)		RY
204	NS	she was there?		QYN
205	AS	(*vocalisation)		RY
206	NS	ok		A
207	AS	(*vocalisation)		In
208	NS	is this (.) is this a different Aunty though (.) [are we talking?]		QYN
209	AS	[(*vocalisation)]		In
210	NS	or is this the Aunty that goes with the uncle?		QYN
211	NS	(*coughs) <u>DIFFERENT AUNTY (.) THE ONE THAT GOES WITH THE UNCLE</u>	holds up hand to represent each choice	QCH
212	AS		looks at hand representing different Aunty	RCH
213	NS	ok (.) Mum's sister (.) Mum's Sister? has Mum got a Sister?		A QYN QYN
214	AS	(*VOCALISATION) (shakes head)		RN
215	NS	(*coughs)		
216	AS	(*vocalisation)		In
217	NS	Mum?		C
218	AS	(*vocalisation)		In
219	NS	so we've got Dad's Brother (.) so <u>YOU'RE UNCLE</u>	pointing at finger to represent Uncle	S
220	AS	(*vocalisation)		In
221	NS	Aunty?	pointing at next finger to represent Aunty	C
222	AS	(*vocalisation)		RY
223	NS	no?		C
224	AS	'yes' (nods)		RY
225	NS	yes (.) ok (.) Mum Dad D and you (.) anybody else? (.) Is	holds up hands with each person	A S

		that it? (.)	represented as a finger	QYN QYN
226	AS	'no' (shakes head)		RN
227	NS	dogs (.) have you got your dogs still?		QYN
228	AS	'no' (shakes head)		RN
229	NS	no (.) so there were 6 of you there (.) I bet that was busy then wasn't it?		A Co QYN
230	AS	(*vocalisation)		
231	NS	so (.) were they there all day? (.) all these people did they stay for the whole day?		QYN QYN
232	AS	(*VOCALISATION) (nods)		RY
233	NS	oh (.) so what else did you do then? (.) (point) shall I help you to get back?	points to device	QW QYN
234	AS	'yes' (nods)		RY
235	NS	Is that alright?		C
236	AS	'yes' (nods)		RY
237	NS	go back (.) timetable (.) english (.) a lot of pages hey S (.) story telling (.) Christmas	Accessing device and changing pages	Co Ex
238	NS	so now what do we want? (point)  (.) objects again?	points to device screen looks at AS	QW QYN
239	AS	'no' (slight shake of head)		RN
240	NS	or actions or descriptions (.) so (.) and do you want to clear that yet? (point)	points to device screen	QCH QYN
241	AS	(*vocalisation)		NPC
242	NS	it's up to you do you want to clear it yet?		QYN
243	AS	(nods) (*VOCALISATION)		RY
244	NS	yeh (.) are <u>YOU</u> gonna do it? (point)	points to AS	A QYN
245	AS		accesses device	RY
246	NS	it's cos you've got a yellow face	whispered	Ex
247	NS	(*unintelligible speech)		NPC
248	AS		accesses device but changes page to something not wanted	
249	NS	it's alright S don't worry (.) english (.) story telling (.) Christmas	accesses device and changes pages	Co Ex
250	NS	see if you can get this one (point)	points to device screen	I
251	AS		struggles to access device	RI

252	NS	can you get that one?		QYN
253	AS	'no' (shakes head)		RN
254	NS	need some help?		QYN
255	AS	'yes' (nods)		RY
256	NS		accesses device and clears message bar	
257	NS	right there you go objects actions or descriptions (point) (.) so what else happened to you throughout the day? (.) what did you all do together?	points to device screen	Ex QW QW
258	AS		accesses device and selects rest button	
259	NS	you're having a rest (.) <u>IS THAT ON OR OFF?</u> (.) I can never remember which way round it is	gestures to rest symbol on device screen	A QYN Co
260	AS	(*vocalisation)		NPC
261	NS	<u>IS RED ON OR OFF?</u>	holds up hand to represent each choice	QCH
262	AS		looks at hand representing off	RCH
263	NS	you think red's off (.) are you having a little rest?		A QYN
264	AS	'yes' (nods)		RY
265	NS	<u>THAT'S FINE</u> (nods) (.) you can have a little rest (..) that's fine		A A
266	NS	you just need to let us know when you're ready (..) alright?		Ex C
267	NS	so (.) so far then YOUR days a bit similar to MINE isn't it (.) cos I opened presents in the morning too with my family	gestures to herself then AS	Co In
268	AS	(*vocalisation)		
269	NS	some of my family (.) and then I opened more later on didn't I		In
270	NS	do you get to open more later in the day as well? (.) or do you open them all at once?		QYN QYN
271	NS	<u>YOU OPEN SOME LATER (.) OR YOU OPEN THEM ALL AT THE SAME TIME?</u>	holds up hand to represent each choice	QCH
272	AS		looks at hand representing some later	RCH
273	NS	'yes' (nods) some later (.) it's better that way isn't it (..) you've got something else to look forward to haven't you		A Co
274	AS	(*vocalisation)		
275	NS	(*laughs)		

276	AS	(*vocalisation)		
277	NS	alright? (.) how ya doing? (.) are you ready to start again?		QYN QW QYN
278	AS	(*VOCALISATION) (sits up and nods)		RY
279	NS	yeh ok (.) do you want me to unstop it? unstop it (.) that's not a very good word is it		A QYN Co
280	AS	'no' (shakes head)		RN
281	NS	(*laughs)		
282	AS		accesses device and removes rest button	
283	NS	good girl (.) well done (.) right so what page are you gonna go in?		Pr Pr Ex
284	AS		accesses device	
285	NS	that's it nice green face good girl (.) so where the dot is (point) (.) that's where it sees you're looking	points to specific area of device screen	Pr Ex
286	AS	(*vocalisation)	looks at screen then to NS	RH
287	NS	want some help?		QYN
288	AS	'yes' (nods)		RY
289	NS	which one do you want to go in to? (.) IS IT DESCRIPTIONS (.) ACTIONS OR OBJECTS (POINT)	points to device screen to indicate each choice	QW QCH
290	AS		accesses device and selects objects	RCH
291	NS	oh you've done it yourself now look (.) now is it something else on that page that you all did together?		Co QYN
292	AS	'stocking'		RY
293	NS	stockings (.) did you have some presents in your stocking as well?		A QYN
294	AS	(smiles and nods) (*VOCALISATION)		RY
295	NS	just <u>YOU</u> or everybody?	points at AS	QCH
296	AS	(*vocalisation)		RCH
297	NS	<u>JUST S HAD A STOCKING</u> (.) <u>EVERYBODY HAD A STOCKING</u>	holds up hands to represent each choice	QCH
298	AS		looks at hand representing everybody	RCH
299	NS	(nods) <u>YEH</u> (.) so where was your stocking? (.) <u>WAS IT BY YOUR BED</u> (.) <u>OR DOWNSTAIRS?</u>	holds up hands to represent each choice	A QW QCH



300	AS		looks at hand representing downstairs	RCH
301	NS	sownstairs (.) so do YOU just open your stocking presents in the morning?	points at AS	A QYN
302	AS	(*vocalisation)		NPC
303	NS	<u>YES (.) OR NO</u>	holds up hands to represent each choice	QCH
304	AS		looks at hand representing no	RCH
305	NS	no (.) [so you open some of your other presents as well]		A A
306	AS	[(*vocalisation)]		C
307	NS	in the morning		C
308	AS	(*VOCALISATION) (nods)		RY
309	NS	yeh?		C
310	AS	'yes' (nods)		RY
311	NS	cool (.) so what about a bit later in the day? (.) I bet that took most of the morning didn't it? for all of you [to open your presents]		A QW QYN
312	AS	[(*VOCALISATION)] (nods)		RY
313	NS	make lots of mess?		QYN
314	AS	(*VOCALISATION) (nods)		RY
315	NS	yeh it's all part of the fun isn't it (..) so what else did you do together in that day then?		A QW
316	AS	(*vocalisation)	looks at device screen	RW
317	NS	can you see it on there? (.) I can see you're looking		QYN Ex
318	NS	have you seen what you're looking for?		QYN
319	AS	(*VOCALISATION) (shakes head)		RN
320	NS	do you know what <u>ALL OF THESE</u> are?	gestures around device screen	QYN
321	AS	'no' (shakes head)		RN
322	NS	no (.) would you like a reminder?		A QYN
323	AS	(nods) (*VOCALISATION)	looks at NS	RY
324	NS	yeh (.) ok well you know that one cos you've had <u>THAT ONE</u> (point)	points to screen	A Co
325	NS	so that's presents (.) that's a (point) Christmas tree (.) Santa Claus (.) decorations (.) lights stocking (.) toys (.) food (.) Christmas dinner (.) and then you've got your yes and	points to each in turn on screen	Ex

		your no		
326	NS	so is it on there what you're looking for?		QYN
327	AS	'no' (shakes head)		RN
328	NS	no (.) do you wanna have a look at the more objects then (point) and see if it's on that page	points to device screen	A I
329	AS		sits up	RI
330	NS	good girl		Pr
331	AS		accesses device but leans forward	
332	NS	oh (.) no it's gone again look		Ex
333	AS		sits up again	
334	NS	well done		Pr
335	AS		accesses device and starts to select incorrect icon then looks away	
336	NS	(*laughs) good looking away (.) well done S		Pr Pr
337	NS	where's your dot gone? must be down the bottom somewhere mustn't it		Co Ex
338	AS		struggles to access device at bottom of screen	
339	NS	we need to move that one as well really don't we		Co
340	NS	would you like me to select it? (.) as it's not really in the best place for you		QYN Ex
341	AS	'yes' (nods)		RY
342	NS	and then I'll move it for next time yeh?	accesses device and changes page	QYN
343	NS	let me write that down (.) so then we've got (.) oh look you've got Mum and Dad there look		Co Co
344	NS	(point) singing (.) music (.) TV (.) film (.) might have sung some carols? (.) turkey (.) Christmas pudding (.) so is it on there what you're looking for?	points to each button in turn on device	Ex QYN
345	AS	'no' (shakes head)		RN
346	NS	no (..) did you all sit around and have Christmas dinner (.) together?		A QYN
347	AS	(nods) (*VOCALISATION)		RY

348	NS	did you have your Christmas dinner at home? (.) or did you go to the pub for your Christmas dinner?		QYN QYN
349	AS	'no' (shakes head)		RN
350	NS	have it at home?		C
351	AS	(nods) [( <u>*VOCALISATION</u> )]		RY
352	NS	'yes' (nods) [so can] you remember where Christmas dinner is? (.) it is on there (.) look go back	accesses device and changes page	A QYN Ex I
353	NS	can you see it now? (.) not a very good Christmas dinner cos it don't look like <u>CHRISTMAS DINNER</u> does it	gestures toward device screen	QYN Co
354	AS	(*vocalisation)		A
355	NS	looks like a bit of steak to me (*laughs) (.) again it's down (.) it's on that bottom row S (.) see if you can reach that or not		Co Ex I
356	AS		struggles to access device	RI
357	NS	ok sit yourself up		I
358	AS		sits up	RI
359	NS	good girl		Pr
360	AS		struggles to access device	
361	NS	he's still red at the moment isn't he (.) which (.) it will pick you up but it won't be as accurate		Ex Ex
362	AS		sits up and adjusts to get better configuration on device	
363	NS	beautiful well done (.) that's a good green face then you looked away		Pr Ex
364	AS		looks at NS	
365	NS	what?		QW
366	AS		accesses device	
367	NS	that's it that's it (.) let's see if you can get that Christmas dinner (..) it's frozen hasn't it		A I Co
368	NS	look away and go back again its frozen hasn't it		I QYN
369	AS	'yes' (nods)	looks at NS	RY
370	NS	mmm (.) one more go and if you can't get it I'll select it for you		A Ex

371	AS		goes back to access device but struggles to access desired button so looks at NS	RH
372	NS	unlucky (.) I know what the deal was alright (*laughs) (.) 'Christmas dinner'		A Co
373	NS	Christmas dinner (.) all together		A
374	AS		accesses device and changes page	
375	NS	so (.) where have you gone now? (.) get back in there (.) storytelling	accesses device and changes page back	QW Co
376	AS		moves back suddenly in her chair and catches NS' face with hand	
377	NS	ouch (*laughs)		Co
378	NS	so (.) is what you had for Christmas dinner there? (.) did you have roast turkey? (point)	whispered points to device screen	QYN QYN
379	NS	did you have a roast?		QYN
380	AS	(nods) (*VOCALISATION)		RY
381	NS	did you have a roast turkey?		QYN
382	AS	(nods) (*VOCALISATION)		RY
383	NS	a big bird		C
384	AS	(nods) (*VOCALISATION)		RY
385	NS	yeh		A
386	AS	'Christmas pudding'	as AS nods device is activated	In
387	NS	oh and a Christmas pudding (.) you said that without even looking at it		A Co
388	AS		accesses device	
389	NS	not undo (.) if you wanna get rid of just that one it's rub out (point)	points to device screen	Ex
390	NS	if you didn't mean to select it it's this one isn't it (.) RUB OUT (point) (..) remember	points to device screen	Ex
391	AS	'Dad'		In
392	NS	(*laughs) Christmas pudding and dad		A
393	AS	(smiles) (*vocalisation)		
394	NS	did Dad have Christmas pudding?		QYN
395	AS	'yes' (nods slightly)	looks at NS	RY
396	NS	did he?		C

397	AS	'yes' (more definite nod)		RY
398	NS	does he like Christmas pudding		QYN
399	AS	(slight nod) (*VOCALISATION)		RY
400	NS	yeh (.) do you like Christmas pudding? (point)	points as AS	A QYN
401	AS	'yes' (nods)		RY
402	NS	with custard?		QYN
403	AS	'yes' (slight nod)		RY
404	NS	custard?		C
405	AS	(nods) (*VOCALISATION)		RY
406	NS	yeh (.) I don't really like Christmas pudding (.) I've only just started liking mince pies (.) as long as they've got lots of cream on them (*laughs) (.) do you like mince pies?		A In QYN
407	AS	(nods) (*VOCALISATION)		RY
408	NS	yeh (.) oh cool (.) so we know then that you opened lots of presents in the morning (.) with your family (.) you had Christmas dinner (.) and your Dad had Christmas pud		A,S
409	NS	is there anything else you wanna tell me about your Christmas day?		QYN
410	AS	'no' (shakes head)	looks at NS	RN
411	NS	no (.) you finished? did you have a good Christmas Day?		A C QYN
412	AS		accesses device	RY
413	NS	it looked like you were looking straight at that S		Co
414	AS		looks at NS	
415	NS	are you trying to say yes to me?		QYN
416	AS	'yes' (nods)		RY
417	NS	mmm (.) you were looking at it (.) 'yes'	accesses device	A A
418	NS	yes (.) good I'm glad you had a good Christmas Day		A Co
419	AS	(*vocalisation)		NPC
420	NS	and it'll be here again before we know it		Co
421	AS	(*vocalisation)		
422	NS	cool (..) well done S		A Pr

## Appendix C4.3

### Participant S: Session Two Fictional Narrative – The Bus Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	so it's just called the bus story (.) so (.) I'll take this off	removes cap from device	Ex Ex
2	NS	ok (.) so what's happening here?		QW
3	AS		accesses device	
4	NS	that's alright (.) yeh		A
5	AS	'bus driver'		RW
6	NS	the bus driver		A
7	AS	'drive'		RW
8	NS	'yes' (nods) he is driving isn't he (.) he's driving (.) what's he driving?		Co QW
9	AS		accesses device and highlights setting but not for long enough	
10	NS	ooh nearly (.) little bit longer babe		A Ex
11	AS		accesses device and changes page by mistake	
12	NS	I'll get you back it's fine	accesses device and changes page back	Ex
13	AS	(*vocalisation)		
14	NS	where are you trying to go? (.) there's your page (.) where are you trying to go?		QW Ex QW
15	NS	do you want one of these other pages? (point)	points to device screen	QYN
16	AS	'yes' (nods)		RY
17	NS	yeh (.) ok get your head up cos you've lost your eyes look (point)	points to device screen	A, I Ex
18	AS		sits up	RI
19	NS	that's it (.) good girl		A Pr
20	NS	you just need to tell me when you're ready for the next page too		I

21	NS	so you've got the bus driver (.) and he's driving (..) are you going to tell us what he's driving?		S QYN
22	AS	'yes' (nods)	looks at NS	RY
23	NS	yeh (.) ok		A
24	AS	(shakes head)		RN
25	NS	no (.) do you want some help to tell us what he's driving?		A QYN
26	AS	'yes' (nods)		RY
27	NS	ok if you look at it (.) and I can see where that red dot is (.) Its lost you (point) (.) then I don't mind selecting it for you	points to top of screen	A Ex Ex
28	NS	right where's the red dot gone		R Co
29	AS		highlights selection on device	
30	NS	Oh ok good girl (.) 'bus'		A Pr In
31	NS	he's driving a bus (.) he is driving a bus there (point) (.) mmm what's happened here then? (point)	points to page points to next picture	A Co QW
32	AS	['bus driver']		RW
33	NS	'yes' (nods) [bus driver] (.) yeh		A
34	NS	now do you know what these ones are? (point)	points to device screen	QYN
35	AS	'no' (shakes head)		RN
36	NS	no (point) that's mend (.) that's fix	points to each option on device screen in turn	A Ex
37	NS	do you want one of those?		QYN
38	AS		accesses device	
39	NS	so did he mend (.) or fix? (.) could be either of those couldn't it (.) it's up to you		QCH Ex
40	NS	he's got that spanner in his hand hasn't he (point)	points to book	Co
41	AS	'fix'		RCH
42	NS	fix what was he fixing?		A QW
43	AS	(*vocalisation)		RW
44	NS	what was he fixing?		QW
45	AS		accesses device and tries to select	
46	NS	(*coughs) where are you looking S		QW
47	NS	you're looking at it aren't you (.) you've lost it look it's gone		Co

		again (point)	points to device screen	Ex
48	NS	that's it		A
49	AS		looks at NS	
50	NS	you were looking at it		A
51	AS	'town'		In
52	NS	did you want town?		QYN
53	AS		accesses device	
54	NS	were you trying to get <u>THIS ONE</u> ?	points to device screen	QYN
55	NS	do you want me to [rub out for you?]		QYN
56	AS	['drive'] 'yes' (nods)		In RY
57	NS	or are you onto the next page?		QYN
58	NS	<u>YOU WANT ME TO RUB OUT TOWN AND DRIVE (.) OR DO YOU WANT ME TO (.) OR ARE YOU READY FOR THE NEXT PAGE?</u>	holds up hand to represent each choice	QCH
59	AS		Looks at hand representing rub out	RCH
60	NS	you want me to rub out (.) there we go	accesses device and rubs out errors	A Ex
61	NS	so he's fixing (.) the bus (point) (.) is that right?	points to device screen	C
62	AS	'bus'		In
63	NS	fixing the bus (.) he is fixing the bus (.) well done (.) right		A Pr R
64	NS	(laughs) (point) and what is the bus doing?	points to next picture	QW
65	NS	(laughs) (point) he's a cheeky bus isn't he	points to next picture	Co
66	AS	(*vocalisation) (.) 'drive'		RW
67	NS	'yes' (nods) so the bus (.) has <u>DROVE AWAY</u> hasn't he	uses gesture to indicate bus driving away	A Co
68	NS	I don't know if we've got without his um driver (.) I don't know if that was on there		Co Co
69	NS	unless you say no driver (point) (.) we could try that	points to device screen	Ex
70	AS		accesses device	
71	NS	is that what you [wanna say?]		QYN
72	AS	['mend']		In
73	NS	'yes' (nods) he was trying to mend it wasn't he (.) while the driver was trying to mend it		A Co
74	AS		accesses device	
75	NS	you wanna rub it out aren't you		C



76	NS	want me to rub that out?		QYN
77	AS	'yes' (nods) 'drive'		RY In
78	NS	right so (point) (.) so d'you wanna say no bus driver?	rubs out errors points to device screen	R QYN
79	AS	'yes' (nods)		RY
80	NS	it's quite difficult on that bottom row isn't it		Co
81	AS		struggles to access device	
82	NS	you know what to do if you want some help		I
83	AS		looks at NS	RH
84	NS	'yes' (nods) you want some help		A C
85	AS	'yes' (nods)		RY
86	NS	how about if I select the no (.) and YOU select the bus driver (point) (.) is that a deal?	points to self point to AS	Ex QYN
87	AS	'yes' (nods)		RY
88	NS	cool (.) ok (.) well there's (.) 'no' (.) there's your no	accesses device	Pr Ex
89	NS	so you need to try and get the bus driver (point) (.) up here (point)	points to device screen	I
90	AS		accesses device	RI
91	NS	oh little bit longer		Ex
92	AS		accesses device but almost selects incorrect icon so looks away	
93	NS	(*laughs) that's it (.) good looking away good girl		A Pr
94	AS	'bus driver'		RI
95	NS	do you want to listen to what you've said so far? (point)	points to device screen	QYN
96	AS	'bus driver drive bus bus driver fix bus drive no bus driver'		RY
97	NS	he's cheeky isn't he		Co
98	AS	'yes' (*vocalisation)	AS smiles	RY
99	NS	are you ready for the next page?		QYN
100	AS	(nods) (*VOCALISATION)		RY
101	NS	ok (.) right you ready then	turns page	A R
102	NS	(*laughs) I don't know if you've got a train you'll have to have a look in your objects I can't remember		Co
103	NS	right you know where he's going don't you so it's up to you (.)		R

		you can either look to see if there's a train		Co
104	AS		accesses device and highlights icon	
105	NS	'yes' (nods) you're going to the town		A
106	AS		hovers on highlighted icon but then looks away	
107	NS	ooh fraction longer		Ex
108	AS	'town'		In
109	NS	'yes'(nods) well done		A Pr
110	NS	he drove to the town with no bus driver		S
111	AS	(*vocalisation)		NPC
112	NS	did he (.) so (.) d'you wanna have a little look in the objects and see if there's anything else on this page (point)	points to device screen then book	A I
113	NS	cos I can't remember		Co
114	AS		accesses device and changes page	RI
115	NS	oh yeh		A
116	AS	'spanner'		In
117	NS	yeh the bus driver had the spanner didn't he (.) anything else on this page for this picture? (point)	points to device screen then page	A QYN
118	AS	(*vocalisation)	sits up	RN
119	NS	oh (.) green face wow (.) good		Co Pr
120	NS	do you want me to get rid of spanner (..) or do you want that left?		QCH
121	NS	<u>GET RID OF IT (.) LEAVE IT</u>	holds up hand to represent each choice	QCH
122	AS		looks at hand representing get rid of it	RCH
123	NS	get rid of it (.) ok	accesses device and removes error	A
124	NS	oh it got rid of town as well (.) you must've done it at the same time (point)	points to device screen	Co Ex
125	NS	let me go back and put in your town	accesses device and changes page	Ex
126	AS	'yes' (*vocalisation)		RY
127	NS	'yes' (nods) I'll put it back (.)		A

		'town' (.) you must have done it at the same time as <u>ME</u> (I*aughs) well done	points to self	Ex Pr
128	NS	ok (.) so what did he see in the town? (point)	points to device screen	A QW
129	AS		accesses device and highlights icon	
130	NS	good girl (.) bit longer		Pr Ex
131	AS	[ <i>'policeman'</i> ]		RW
132	NS	[a policeman] and what was he doing?		A QW
133	AS		accesses device and highlights icon	
134	NS	oh well done		Pr
135	AS	'hill'		RW
136	NS	d'you want hill?		QYN
137	AS	'no' (*vocalisation)		RN
138	NS	no (.) we'll just rub it out we won't clear it (.) It's <u>GONE</u>	accesses device and removes errors uses gesture to indicate 'gone'	A Ex A
139	NS	so policeman what else? (point)	points to device screen	QW
140	AS		accesses device	
141	NS	you trying to get that whistle?		QYN
142	AS		highlights icon but not for long enough to select	
143	NS	oh unlucky (.) look you're just (point)	points to device	A
144	AS	(*vocalisation)		
145	NS	It's difficult on that bottom row isn't it		Co
146	NS	you look like you're looking at it to me	looks round side of device to look at AS eye gaze	Co
147	AS	(nods) (* <u>VOCALISATION</u> )	looks at NS	RH
148	NS	the whistle?		C
149	AS	'yes' (nods)		RY
150	NS	would you like some help?		QYN
151	AS	'yes' (nods)		RY
152	NS	yeh (.) policeman whistle (.) 'whistle'		A In
153	NS	yep anything else off that page? (..) If not we'll go back		A QYN Ex
154	AS		accesses device	
155	NS	you're looking aren't you good girl		Co Pr
156	AS			

157	NS	are you trying to get it into rest or speak?	accesses device	QCH
158	NS	what are you after (point) rest or speak?	points to each option in turn	QCH
159	AS		accesses device and highlights speak	RCH
160	NS	ah		A
161	AS		looks away from icon before selecting	
162	NS	ooh		A
163	AS	<i>'bus driver drive bus bus driver fix bus drive no bus driver town policeman whistle'</i>		In
164	NS	(*laughs) now what do you want next?		QW
165	AS		accesses device and changes page	
166	AS	<i>'surprised'</i>		RW
167	NS	(*laughs) surprised (.) who's surprised?		A QW
168	AS		accesses device	
169	NS	that's it (point) good girl	points to device screen	A Pr
170	AS		accesses device and changes page	
171	NS	who was surprised is it on there?		QW
172	AS	<i>'drive'</i>		RW
173	NS	d'you think the bus was surprised as well?		QYN
174	AS		accesses device and changes page x2	
175	NS	good girl S you're doing really well		Pr
176	AS	<i>'red'</i>	accesses device and rubs out red	In
177	NS	well done (.) good		Pr
178	AS		accesses device	
179	NS	you're obviously looking for something aren't you		Co
180	AS	<i>'mend'</i>		In
181	NS	d'you want me to rub that out?		QYN
182	AS	<i>'yes'</i> (nods)	looks at NS	RY
183	NS	<i>'yes'</i> (nods) I've got a question for you (.) d'you think the bus was driving fast (.) or slow?	accesses device and rubs out mend	A QCH
184	AS		looks at picture book	
185	NS	are you looking at that picture? (.) d'you think he's driving fast through the tunnel (point) (.) or slow through the tunnel?	points to page	QYN QCH

186	NS	<u>FAST (.) OR SLOW</u>	holds up hand to represent each choice	QCH
187	AS		looks at hand representing fast	RCH
188	NS	fast (.) can we find the fast on there? (point)	points to device screen	A I
189	AS		accesses device and moves head	
190	NS	good adjustment S		Pr
191	AS		accesses device and highlights icon	RI
192	NS	good girl		Pr
193	AS		accesses device and changes page	RI
194	NS	excellent well done		Pr
195	AS	'naughty'		In
196	NS	he was naughty wasn't he		A
197	NS	can you find fast? we've got quick there (point) or fast was on the previous page (.) It's up to you	points to device	QYN Ex
198	AS		accesses device	
199	NS	it's not		
200	AS		accesses device and changes page	
201	NS	good girl (..) <u>IT'S THIS ONE</u> (.) Can you get to that one?	points to device screen	Pr Ex QYN
202	AS	'fast'		RY
203	NS	he is a naughty bus isn't he (..) cheeky too don't you think		A Co
204	NS	are you ready for the next page yet?		QYN
205	AS	'yes' (nods)		RY
206	NS	or is there still something else you wanna say on that page?		QYN
207	NS	<u>YOU'RE READY FOR THE NEXT PAGE (.) THERE'S STILL MORE YOU WANNA SAY</u>	holds up hand to represent each choice	QCH
208	AS		looks at hand representing next page	RCH
209	NS	ok good girl	turns page	A Pr
210	NS	ok err now what's he doing? (..) hey (.) where's he going now?		QW QW
211	AS	'fix'		RW
212	NS	that was accidental wasn't it		C
213	AS	'yes' (nods)		RY

214	NS	ok right (.) so do you want your object page? (point)	accesses device and rubs out error points to device screen	R QYN
215	AS		accesses device and highlight icon	
216	NS	'yes' (nods) ok (*unintelligible speech) cos he did drive		A Co
217	AS	'drive'		In
218	NS	drive (.) where did he drive to next? (..) he's been to the town hasn't he		A QW S
219	AS		accesses device	
220	NS	you're doing really well S		Pr
221	AS		accesses device and changes page	
222	NS	mmhmm good girl		Pr
223	NS	so d'you think it's a hill is that what you're looking for?		QYN
224	NS	HAVE A LOOK (.) think it's a hill? (..) or is that later?	holds up book for AS to look at	I QCH
225	NS	<u>IT'S A HILL (.) OR THAT'S LATER</u>	holds up hand to represent each choice	QCH
226	AS		looks at hand representing hill	RCH
227	NS	ok that one's a hill (point)	points to device screen	A Ex
228	AS		accesses device then looks away	
229	NS	good tactic S		Pr
230	AS		accesses device then looks away	
231	NS	good tactic I like that		Pr
232	NS	you finding it difficult to get over <u>THIS SIDE</u>	gestures direction by moving head	QYN
233	AS	'yes' (*vocalisation)		RY
234	NS	yeh (.) oh I see (.) you've got 2 choices there haven't you (.) cos you've got your fence and you've got your hill (point)	points to device screen	A Co Ex
235	NS	so which one d'you want first?		QW
236	AS	(*vocalisation) (.) 'hill'		RW
237	NS	hill (.) he did drive up the hill didn't he (.) then what did he do? (point) (.) what did he do?	points to page	A QW QW
238	NS	I don't know if we've got jumped (.) or over that would be in the descriptions I think		Ex Co
239	NS	d'you want to have a look? (.)		QYN

		with some help?		C
240	AS	'yes' (nods)		RY
241	NS	yeh (.) so let's go back and just see	accesses device and changes page x2	A Co
242	NS	I can't remember what's there now (.) can't see it there (..) No I can't see it there either (.) I can't find it it's not there	accesses device and changes page accesses device and changes page	Co Ex Ex
243	NS	so (.) we were in there weren't we	accesses device and changes page	Co
244	NS	SO ARE YOU SAYING HE DROVE UP THE HILL (.) AND THEN DID YOU WANT (.) OVER (.) UNDER (.) AROUND	holds up hand to represent each choice and points to head for 3rd choice	C QCH
245	AS		looks at hand representing over	RCH
246	NS	over (.) over what? (.) you can tell us what can't you cos that's there (point)	points to device	A QW
247	AS		accesses device	
248	NS	good girl (..) when you're ready (..) it can't see you (point)	points to device screen	Pr Co Ex
249	AS		sits up	A
250	NS	good girl		Pr
251	AS		struggles to access device	
252	NS	if I see you looking at it then I'll help you select it S (.) ok		Ex C
253	AS		accesses device and highlights icon but then looks away	
254	NS	oh unlucky		A
255	AS	(*vocalisation)	struggles to access device	RH
256	NS	d'you want some help?		QYN
257	AS	'yes' (nods slightly)		RY
258	NS	yeh (.) ok		A
259	NS	is it in this row? (point) (.) what you're looking for (.) yes or no?	points to device screen	QYN QYN
260	AS	'yes' (nods)		RY
261	NS	yes (.) Is it (.) tool? (.) yes or no (..) fen erm policeman		A QYN Ex QYN
262	AS		accesses device and highlights icon	
263	NS	oh you nearly had it then S good girl I'll select that the [fence] ['fence']		Co Pr Ex

264	NS	he did (.) so he drove <u>OVER THE HILL</u> (.) or up the hill (.) and <u>OVER THE FENCE</u> (.) didn't he	uses gesture to indicate going over the hill uses gesture to indicate going over the fence	A
265	NS	then have you got a cow? (.) can you go onto the next page (.) onto that one (point) and see if you've got a cow	points to device	QYN I
266	NS	<u>THIS ONE</u>	points to specific button on device screen	Ex
267	AS		accesses device and changes page	RI
268	NS	good girl (.) hey (.) can you see the cow?		Pr QYN
269	AS		struggles to access desired icon	
270	NS	good girl (.) good try (.) you're nearly there It's the one above that isn't it		Pr Ex
271	AS	'cow'		RY
272	NS	cow (.) he did see a cow didn't he once he'd jumped over the fence (point)	points to page	A S
273	NS	d'you think the cow's happy to see him? (point)	points to page	QYN
274	NS	not sure?		C
275	AS	'no' (shakes head)		RN
276	NS	not sure		A
277	NS	you ready for the next page? (.) yes or no?		QYN QYN
278	AS	'yes' (nods)		RY
279	NS	yes	turns page	A
280	NS	you'll be pleased to know this is the last page (.) uh oh (.) oh what's happening now?		Co QW
281	NS	he saw a cow and then what?		S QW
282	NS	do you know what all of these are on this page? (point)	points to device screen	QYN
283	AS	'no' (shakes head)		RN
284	NS	would you like a (.) me to tell you what they all say?		QYN
285	AS	'yes' (nods)		RY
286	NS	ok (.) you need to look then (point) (.) We've got field (.) we've got the cow you know that one (.) river (.) lake (.) pond (.) or road	points to each option on device screen in turn	A, I Ex
287	NS	now is what you want on that page or d'you need to go back to the previous page?		QCH



288	AS		looks at book	
289	NS	d'you want me to hold that up so you can see	holds up book	QYN
290	NS	ok (.) tell me when you're ready and I'll move it out the way		A I
291	AS	(*vocalisation)		RI
292	NS	yeh?	puts book down	C
293	AS		accesses device and highlights icon	
294	NS	ah		A
295	AS	'field'		RW
296	NS	the cow was in the field (.) that's right (.) well done		Co A Pr
297	AS		accesses device and highlights icon	
298	NS	good girl		Pr
299	AS	'river'		In
300	NS	then there was the river (..) what happened? (.) what did he do in the river?		A QW QW
301	NS	I think that's on your to (.) I think that's on your first page (point) (.) where all the choices are	points to device screen	Ex
302	AS		looks at NS	
303	NS	did he <u>DRIVE</u> into the river?	uses Makaton sign for 'drive'	QYN
304	AS	'yes' (nods)		RY
305	NS	ok then (.) do you want some help to get back so you can choose it?		A QYN
306	AS	'yes' (nods)		RY
307	NS	yeh (.) I think that's fair enough (.) cos you're doing really well	accesses device and changes page	A Co Pr
308	NS	right (.) can you find <u>DRIVE</u> ?	uses Makaton sign for 'drive'	R I
309	AS		accesses device and highlights icon	In
310	NS	ok you can do bus too if you want		A Co
311	AS		looks away from device	
312	NS	you're doing so well		Pr
313	AS		looks at NS	
314	NS	'yes' (nods) doing really well (.) you've got every single bit of the story in there haven't you (.) It's just this last bit to go		Pr Co Ex
315	AS		looks back and tries to access device	
316	NS	it's gone to sleep hasn't it (.) it'll		Co

		pick you up in a minute (..) there we go		Ex
317	NS	so drive is one of these green ones (point)	points to device screen	Ex
318	AS		accesses device and highlights icon	
319	NS	'yes' (nods) good girl		Pr
320	AS	'drive'		RI
321	NS	so he drive (.) he drove into the river didn't he (..) in there (point)	points to page	A Co
322	NS	who's that sneaking up behind him? (point)	picks up book and points to character	QW
323	NS	is that on there? (.) It's one of the red ones (point)	points to device screen	QYN Ex
324	AS		accesses device and highlights icon	
325	NS	you looked away and stopped it didn't you (.) good girl		Co Pr
326	AS		accesses device	
327	NS	it keeps flicking between green yellow and red today		Ex
328	NS	can you see the one you want?		QYN
329	AS	'yes' (nods slightly)	looks at NS	RY
330	NS	yeh		C
331	AS	(*vocalisation)		RH
332	NS	d'you want some help?		QYN
333	AS	'yes' (nods slightly)		RY
334	NS	ok (.) you've gotta tell me though		A I
335	NS	right (.) one of these isn't it (point)  (.) so is it (.) is it <u>THIS ONE</u> that you want? (point)	points to device screen  points to device screen	R  C QYN
336	AS		looks at NS	
337	NS	no		C
338	AS	'yes' (nods)		RY
339	NS	yes (..) 'bus' (.) ok		A
340	NS	and who's that behind him? (.) that's one of the red ones too (point)	points to device screen	QW Ex
341	NS	I think I know the one you want		Co
342	AS		looks at NS	
343	NS	tired?		QYN
344	AS	'yes' (nods)		RY
345	NS	yeh		A
346	NS	ok well what I'll do (.) if I point to it (.) you need to tell me if it's		A Ex

		the one you want or not (.) Is that a deal?		I C
347	AS	'yes' (nods)		RY
348	NS	yeh (.) ok		A
349	NS	<u>SO IS IT RED (.) GREEN (.) OR BLUE THAT YOU WANT?</u>	holds up hand to represent each choice and points to head for 3rd choice	QCH
350	AS		looks at hand representing red	RCH
351	NS	red (.) is it bus?		A QYN
352	AS	'no' (shakes head)		RN
353	NS	no (.) is it bus driver?		A QYN
354	AS	'yes' (nods)		RY
355	NS	yes (.) oh so the [bus driver] ['bus driver']		A
356	NS	he finally caught up with him didn't he (point)	points to page	Co
357	NS	I don't know if that's in there (point) shall I see if I can find it?  (.) first (.) before I make you look for it (.) is that alright?	points to device screen looks at AS	Co QYN Ex C
358	AS	'yes' (nods)		RY
359	NS	yeh (.) we've got run away (point) (.) we've got follow (.) you could have follow (.) the bus driver was following him wasn't he (point) (.) which is that one	accesses device and changes page points to screen  points to device screen	A  Ex
360	NS	can you see if you can get it? (.) or have you had enough?		QCH
361	AS	'go'	looks over to undo icon	In
362	NS	It's alright I'll do that	accesses device and removes go	Co
363	AS	(*vocalisation)	looks at NS	RH
364	NS	have you had enough for the minute?		QYN
365	AS	'yes' (nods)		RY
366	NS	do you want follow?		QYN
367	AS	'yes' (nods)		RY
368	NS	yes (.) he was following him [wasn't he] ['follow']		A Co
369	NS	and I don't think (.) and he found him didn't he (point)	accesses device and changes page points to device screen	Co

370	NS	d'you want four find?		QYN
371	AS	'yes' (nods)		RY
372	NS	he found (.) 'find'		A
373	NS	and what did he find?	accesses device and changes page x2	QW
374	NS	<u>AND DID HE FIND SOMETHING IN THE RED (.) GREEN (.) OR THE BLUE?</u>	holds up hand to represent each choice and points to head for 3rd choice	QCH
375	AS		Looks at hand representing red	RCH
376	NS	the red (.) did he find the town? (point) (.) yes or no	points to device screen	A QYN
377	AS	(shakes head) 'no'		RN
378	NS	no silly W (.) did he find (.) himself the bus driver? (point)	points to device screen	A QYN
379	AS	'no' (shakes head)		RN
380	NS	no (.) did he find the bus? (point)	points to device screen	A QYN
381	AS	'yes' (nods)		RY
382	NS	he did (.) 'bus'		A
383	NS	ok do you want to listen to it all now then (.) is that it? (.) have you finished?		QYN QYN QYN
384	AS	'yes' (nods)		RY
385	NS	do you wanna listen to it all?		QYN
386	AS	'yes' (nods slightly)		RY
387	NS	here we go (.) you ready	accesses device	R
388	NS	<i>'bus driver drive bus bus driver fix bus drive no bus driver town policeman whistle surprised drive naughty fast drive hill fence cow field river drive bus bus driver follow find bus'</i>		In
389	NS	excellent (.) well done S that was really good (.) cos you haven't got any of the little words (.) you did really really well		Pr Ex Pr

## Appendix C4.4

### Participant S: Session Two Personal Narrative – A Birthday

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	so would you like to tell me about a Birthday for you?		QYN
2	NS	FOR YOU (.) OR FOR SOMEBODY ELSE?	holds up hands to represent each choice	QCH
3	AS		looks to hand representing for herself	RCH
4	NS	yeh (.) cool (.) for you (.) I thought it I thought you would		A Co
5	AS	(*vocalisation)		RY
6	NS	where are you gonna start?		QW
7	AS	(*vocalisation)		RH
8	NS	do you want some help to get started?		QYN
9	AS	'yes' (nods)	gives eye contact	RY
10	NS	yeh (.) so you could start by saying (.) did you have a birthday cake or anything like that?		A QYN
11	AS	(*VOCALISATION)	looks at NS	RY
12	NS	yes or no		QYN
13	AS	'yes' (nods)		RY
14	NS	yes (.) can you see the cake on there? (point)	points to device	A QYN
15	NS	are you on rest? (.) is that colour rest?		QYN QYN
16	AS	'yes' (*VOCALISATION)		RY
17	NS	I can never remember which way round it is		Co
18	AS	'no' (*VOCALISATION)		RN
19	NS	neither can you (*laughs) (..) I think it has to be red doesn't it to work?		A C
20	AS	(*VOCALISATION) (shakes head)		RN
21	NS	which is a bit Irish		Co
22	NS	does it need to be red? (.) S		C AI
23	NS	I'll put it on red if it needs to be (.) I don't expect you to do that		Ex
24	AS	(*vocalisation)		RY

25	NS	yes it needs to be <u>RED</u>	puts hand up as if going to offer choice	C
26	AS	'yes' (nods)	looks straight to hand to say it needs to be red	RY
27	NS	yeh (.) yeh	looks at AS	A C
28	AS	'yes' (nods)		RY
29	NS	there we go then	accesses device and selects icon	A
30	AS		Highlights the icon and deselects it	
31	NS	and you're going to take it straight off you toad (.) get off	reselects icon	Co
32	AS	(*vocalisation)		O
33	NS	so (.) are you gonna tell me about your cake? (point)	points to device screen	QYN
34	A		tries to access device	
35	NS	good looking to see what the symbols are (.) I saw that well done		Pr Pr
36	NS	got a green face now haven't you (.) you've got a green face		Co Ex
37	A		looks at NS	RH
38	NS	haven't you (.) what?		A QW
39	AS	(*vocalisation)	sits up	NPC
40	NS	look at that well done		Pr
41	NS	it's cos you are <u>SAT UP</u> a bit better aren't you (.) it liked that	uses gesture to indicate 'sat up'	Ex
42	NS	now your cake is one of these ones (point)	points to device screen	Ex
43	AS		tries to access device	
44	NS	that's it you were on it briefly		Ex
45	AS	(*vocalisation)	highlights rest icon and looks at NS	RH
46	NS	do you think it's on the wrong colour?		QYN
47	AS	'yes' (nods)		RY
48	NS	d'you think it needs to be yellow?		QYN
49	AS	'yes' (nods)		RY
50	NS	ok let's try it cos I honestly can't remember	accesses device and deselects rest icon	A Co
51	NS	'no' (shakes head) I know it's shocking but I really can't remember		Co
52	AS	'candles'		In
53	NS	oh you was right well done (.) <u>GOOD</u> girl	uses Makaton sign for 'good'	A Pr Pr

54	NS	so did you have candles? (.) were they just <u>FLOATING ABOUT IN THE AIR</u> or was they on something?	gestures hand floating in the air	C QCH
55	AS		accesses device and highlights icon	
56	NS	good girl		Pr
57	AS	'cake'		RCH
58	NS	ah cake (.) that's a funny sound for cake isn't it	says in a deep voice says in a deep voice	A Co C
59	AS	'yes'	looks at NS and smiles	RY
60	NS	candles and cake	says cake in low voice	A
61	AS	(*laughs)		
62	NS	(*laughs) (.) did you have anything else? (.) like maybe some balloons?		QYN QYN
63	NS	I got some 40 balloons as presents (.) did you have any balloons up?		In QYN
64	AS		accesses device and highlights icon then moves away	
65	NS	you can just select yes if you want to		Ex
66	AS		accesses device	
67	NS	are you trying to select drink?		QYN
68	AS		Tries to access device	
69	NS	it's frozen hasn't it (.) you're doing really well S		Ex Pr
70	AS		accesses device then looks at NS	
71	NS	are you trying to get <u>THERE?</u> (point)	points to device screen	QYN
72	AS		looks at device screen	
73	NS	just yes or no'll do just nod or shake your head (.) are you trying to get into <u>THAT ONE?</u> (point)	points to device screen	Ex QYN
74	AS	'no' (shakes head)		RN
75	NS	no (.) are you trying to get into the next one next to it (.) for more objects?		A QYN
76	AS	'no'		RN
77	NS	no (.) where are you trying to go? (.) <u>DO YOU WANT THE RED (.) THE GREEN (.) OR THE BLUE?</u>	holds up hand to represent each choice and points to head for 3rd choice	A QW QCH
78	AS		looks at screen and then to hand representing blue	RCH
79	NS	the blue (.) <u>ARE YOU TRYING TO GET ONE OF THESE BLUE</u>	points to device screen	A

		(point) OR INTO (.) THE NEXT PAGE?		QCH
80	NS	ONE OF THE BLUES ON THE SCREEN (.) INTO THE NEXT PAGE?	holds up a hand to represent each choice	QCH
81	AS		looks at hand representing one on the screen	RCH
82	NS	one of the blues on the screen (.) so you've got small (point)	points to device screen	A Ex
83	NS	are you trying to tell me whether it was a small or a big cake? (point)	points to device screen	QYN
84	NS	yes or no S		QYN
85	AS		tries to access device	
86	NS	it's frozen again isn't it		Ex
87	NS	you trying to tell me what size the cake was?		QYN
88	AS	'yes' (nods)		RY
89	NS	yeh (.) so was it a small cake (.) or a big cake? (point)	points to icons on device screen in turn	A QCH
90	AS	'big'		RCH
91	NS	big (.) quite right too (.) gotta have a big birthday cake haven't you		A Co
92	NS	so does that mean there were lots of candles on it then?		QYN
93	AS	(nods) (*VOCALISATION)		RY
94	NS	quite a few (.) not as many as it was my cake (.) probably		A Co
95	AS	'no' (shakes head)		RN
96	NS	no (.) I know		A
97	NS	ok (.) good (.) so you had a nice big birthday cake		A Pr A
98	AS		accesses device and changes page	
99	NS	did you have a particular party? (point)	points to device screen	QYN
100	AS	'film'		RY
101	NS	a film (.) so did you have a	goes to point to screen but AS has already highlighted icon	A
102	AS	'cinema party'		In
103	NS	'yes' (nods) a cinema party did you		A C
104	AS	'yes' (nods very slightly)	looks at NS	RY
105	NS	yeh (.) so does that what does that mean? (.) you WATCH a film (.) and then do you have something to EAT?	uses Makaton signs for 'watch' and 'eat'	A QW QYN
106	AS	'yes' (nods)		RY



107	NS	yeh (.) do you do anything else?		A QYN
108	AS	'yes' (nods)		RY
109	NS	yeh (.) are there (.) party games? (point)	points to device screen	A QYN
110	AS	(*vocalisation)	tries to access device	
111	NS	good looking well done S		Pr
112	AS		accesses device and changes page	
113	NS	you're going to presents are you?		QYN
114	AS	(accesses device)		
115	NS	ok (.) you didn't want that page (.) no?		A C
116	AS	(shakes head) (*Vocalisation)		RN
117	NS	d'you want me to get you back? (.) cos you're woking very hard		QYN Pr
118	AS	'yes' (nods)	looks at NS	RY
119	NS	yeh (.) you didn't want that page	accesses device and changes page	A
120	NS	so was there party games (.) and party bags? (point)	points to each icon on screen	QYN
121	NS	you told me there was a film (.) which makes sense doesn't it (.) at a cinema		S
122	NS	you've told me that you had <u>EAT</u> /foop	uses Makaton sign for 'eat'	S
123	NS	so you've got party food (.) party games (.) and party bags there (point)	points to each icon on screen	Ex
124	NS	d'you want any of those?		QYN
125	AS	'yes' (nods)	looks at NS	RY
126	NS	yes (.) do you want some help?		A QYN
127	AS	'yes' (nods)		RY
128	NS	yeh (.) you tired?		A QYN
129	AS	'yes' (nods)		RY
130	NS	ok well let me know then (.) I'll point to them		A I Ex
131	NS	party food yes or no? (point)	points to screen	QYN
132	AS	'yes' (nods)	looks at NS	RY
133	NS	yes (.) so party food (.) 'party food'		A
134	NS	anything else? (..) did you have the party food at the cinema?		QYN QYN
135	AS	'no' (shakes head)	looks at NS	RN

136	NS	no		A
137	AS	'no' (shakes head)		RN
138	NS	no (.) did you do party games at the cinema?		A QYN
139	AS	'no' (shakes head)		RN
140	NS	no (.) did you just watch the <u>FILM</u> (.) at the cinema?	uses Makaton sign for 'film'	A QYN
141	AS	'no' (shakes head)		RN
142	NS	no (.) did you watch a did you watch a film as part of your cinema party?		A QYN
143	AS	'no' (shakes head)		RN
144	NS	no (.) so did you go to a different room at the in the cinema?		A QYN
145	AS	'no' (shakes head)		RN
146	NS	to have a party		C
147	AS	'no' (shakes head)		RN
148	NS	no (.) did you watch you're a film at home?		A QYN
149	AS	(shakes head)		RN
150	NS	did you get a film as a present?		QYN
151	AS	'yes' (nods)		RY
152	NS	yes (.) oh I see so you got a film as a present (.) yeh (.) ok (coughs)		A Co A
153	NS	so did <u>YOU</u> have your party at home?	points to AS	QYN
154	NS	we didn't actually put that option on there did we but		Ex
155	AS		accesses device and highlights home page icon	RY
156	NS	(nods) <u>YEH</u> (.) by looking at your home page I'm taking it you had your party at home (.) Is that right?		A C
157	AS		looks at NS	
158	NS	that right?		C
159	AS	(nods) (*VOCALISATION)		RY
160	NS	yes (.) I got there in the end didn't I		A Co
161	NS	ok so you got a new film (.) was it a DVD?		A QYN
162	AS	(nods) (*VOCALISATION)		RY
163	NS	ok (.) so did you have friends come over for your birthday?		A QYN
164	AS	'yes' (nods)		RY
165	NS	ok (.) <u>YOU</u> still had party food?	points to AS	A QYN
166	AS	'yes' (nods)		RY

167	NS	did you have any (.) do any party games? (.) like (.) I dunno <u>MUSICAL STATUES</u> (.) or (.) or pass the parcel	NS pretends to dance	QYN Ex
168	AS		accesses device and highlights icon	
169	NS	mmm		A
170	AS	(*vocalisation)	looks away before icon is selected and looks at NS	RH
171	NS	did you have do some party games?		QYN
172	AS		looks back to device	
173	NS	or did you go (.) cos you've got a swimming pool haven't you		Co
174	NS	did you go in the swimming pool?		QYN
175	AS	'swimming party'		RY
176	NS	you went in your swimming pool (.) did you?		C
177	AS	(* <u>VOCALISATION</u> ) (nods)		RY
178	NS	sounds like a good party to me		Co
179	AS	(nods) (* <u>VOCALISATION</u> )		RY
180	NS	yeh (.) was it fun?		A QYN
181	AS	'yes' (nods)		RY
182	NS	yeh (.) if we go back we can find fun	accesses device and changes page	A Ex
183	NS	can you see fun (.) It's one of the blue ones (point)	points to device screen	I Ex
184	AS		accesses device and changes page	
185	NS	ok go on		A
186	AS		accesses device	
187	NS	I could be really cruel and say you've got to select that first (point)	points to device screen	Co Ex
188	AS		looks at NS	RH
189	NS	d'you want me to select that first?		QYN
190	AS	(* <u>VOCALISATION</u> ) (nods)		RY
191	NS	yes (.) yes (.) so it was 'it was' (.) and then you put	looks at AS	A Ex
192	AS	[ <i>'it was'</i> ]		In
193	NS	and then you've managed it (.) I'll get rid of one (.) that's my one	looks at device and accesses, deletes repeat	Co Ex
194	NS	so it was funny (point) (.) it was	points to device screen	A QC
195	AS		accesses device and highlights icon	RC

196	NS	ok (.) exciting was it		A Co
197	AS		looks away before selecting icon then looks at NS	
198	NS	or surprise (.) was it a surprise for you too? (.) was it?		QYN C
199	AS	'yes' (nods)		RY
200	NS	yeh (.) so you can can you choose that one with the excla (.) it says surprised (point) (.) but that's fine	points to device screen	A Ex
201	AS		accesses device and highlights icon but looks away	
202	NS	go on go on nearly (.) oh oh oh		Co
203	AS	'tired'		In
204	NS	it was tired (.) was it tiring? (.) probably a swimming party		A QYN Co
205	AS		accesses device and tries to select rub out	RN
206	NS	or you trying to get rid of that (.) You're trying to get rid of that aren't you		QYN C
207	NS	(point) this one up (.) up a little bit	points to device screen	Ex
208	AS		selects icon below which clears message box then looks at NS	
209	NS	don't worry it's fine we've got it all		Ex
210	AS		selects undo and recovers work	
211	NS	good use well done (.) you're trying to get that one aren't you (point)	points to device screen	Pr C
212	AS		looks at NS	RH
213	NS	d'you want me to select that one?		QYN
214	AS	'yes' (nods)		RY
215	NS	so		R
216	AS	(*vocalisation)		A
217	NS	it was (.) do you (.) are you looking for fun?		QYN
218	AS	(*VOCALISATION) (nods)		RY
219	NS	yes (.) right you need to go back (.) and it's actually that one (points to icon on screen)	accesses device and changes page	A Ex
220	NS	see if you can get it (.) you struggle down the bottom there don't you sometimes		I Co
221	AS		accesses device and highlights icon	RI

222	NS	oh go on prove me wrong (*laughs) (.) oh nearly just up a fraction you're just below it (point) (.) now you're next to it	points to device screen	Co Ex Ex
223	AS		selects unwanted icon and changes page	
224	NS	try again (point) (.) in there	accesses device and changes page back points to device screen	I Ex
225	NS		accesses device and highlights icon	RI
226	NS	ooh and you're on it (.) it's frozen (.) d'you want me to select <u>THAT</u> (point) (.) cos you were on it (.) Is that ok?	points to specific button on device screen	Co QYN C
227	AS	'yes' (nods)		RY
228	NS	'fun' (.) it was fun (.) d'you want to make it speak it so you can listen		A QYN
229	AS	'candles cake big film cinema party party food swimming party it was fun'		RY
230	NS	ok (.) is there anything else you wanted to share about your birthday?		A QYN
231	AS		accesses device and changes page	
232	NS	I'll get you in there S if you want to (.) so anything else or have you finished? (.) yes or no? (point)	points to icons on device in turn	Ex QCH QYN
233	NS	is there anything else?		QYN
234	AS		struggles to access device then looks at NS	
235	NS	<u>YES OR NO</u>	holds up hand to represent each choice	QCH
236	AS		looks at hand representing no	RCH
237	NS	no (.) you've <u>FINISH</u> /ed?	uses Makaton sign for 'finish'	A C
238	AS	'yes' (nods)		RY
239	NS	yes (.) ok (.) that's cool well done		A Pr

## Appendix C4.5

### Participant S: Session Three Fictional Narrative – Peter and the Cat

	<b>NS/AS</b>	<b>Interaction</b>	<b>Comment/Non-verbal communication</b>	<b>Linguistic Move-Type</b>
1	NS	so do you think you can tell me some things about the story?		QYN
2	AS	(*vocalisation)		RY
3	NS	yeh?		C
4	AS	(*vocalisation)		RY
5	NS	get yourself in a good position then (.) and have a little look (..) then you've got (..) some you know you've got the words there		I Ex
6	AS		struggles to position arms to enable access to device	RI
7	NS	it's alright you can take as long as you need to get yourself in a good position		A Ex
8	AS		puts arms onto tray and sits up	RI
9	NS	good girl well done (.) look at that lovely green face brilliant		Pr Co
10	AS		accesses device and removes 'resting' option	
11	NS	excellent (.) now what are you gonna tell me?		Pr QW
12	AS		looks at vocabulary on device and highlights unwanted symbol so AS shakes head	RW
13	NS	that's a good tactic shaking your head when you're not on one you want well done		A Pr
14	AS		looks away from device	
15	NS	it was still there it'd just gone off the side a bit (.) gone now though look		Ex I
16	AS		sits up	
17	NS	that's it good girl		A Pr
18	AS		accesses device and	

			accidentally changes page	
19	NS	i'll get you back hold on (..) there you go	accesses device and changes page to get to story vocabulary	Ex I Ex
20	AS	(*vocalisation)	selects 'rest' symbol	A
21	NS	are you gonna have a look first (.) d'you need me to (.) tell you what is on this page S?		C QYN
22	AS	'yes' (nods)	looks at NS	RY
23	NS	yeh (.) [ok]		A A
24	AS	[(*vocalisation)]		A
25	NS	right here (point) (.) we've got shocked (.) old (.) and [scared] ['scared'] (.) that was me (.) and scared (.) here and then in there are more descriptions (.) so if you wanna describe something but your word is not there you need to go into there ok (.) here we've got peter (.) boy (.) animals (.) and then there's more objects in there (.) then here we've got climb (.) walk (.) look (.) and then more actions there so things that he did like he went for a walk didn't he (.) and he CLIMB/ed the tree (.) didn't he (.) and then that man looked (signs look) (.) for him didn't he	points to device and indicates each symbol in turn  Uses gesture to indicate 'climb'	R  Ex  Ex  Ex
26	AS		accesses device and clears words in message window	A
27	NS	ok S clearing away my stuff i did well done (.) so (.) can you remember his name? can you remember the boy's name?		A Pr QYN QYN
28	AS	['Peter']		RY
29	NS	[ah] Peter (.) it was Peter		A A
30	AS		accidentally changes page	
31	NS	that one (point) (.) good girl	points to device	I Pr
32	AS		changes back to correct page	RI
33	NS	well done (.) it was Peter (.) and what can you tell me about Peter?		Pr A QW
34	AS	'boy'		RW
35	NS	'yes' (nods) he is a boy well done (..) and what else?		A Pr QW

36	AS	'old'		RW
37	NS	you think he's an old boy? (.) d'you think he's older than you?		C QYN
38	AS	'no'	clears old from the device	RN
39	NS	oh that was a mistake was it (.) ok cool (.) well done (.) so he's Peter and he's a boy		A A Pr S
40	AS		accesses device and changes page then highlights object	RW
41	NS	ok		A
42	AS	'tall'		RW
43	NS	he's a tall boy is he (.) think he looks quite <u>TALL</u>	gestures tall by raising hand	A
44	AS		struggles to access device	
45	NS	now if you wanna go back you have to go to this one (point)	points to device screen	Ex
46	AS		accesses device and changes page	A
47	NS	good girl (..) so he is a tall tall boy (.) so what (.) what was happening in the story? (.) what did he see? (.) you might have to go into there and it might have his (.) <u>CAT</u> if that's what you're looking for	uses Makaton sign for 'cat'	Pr QW S QW Ex
48	AS	'boy' (..) 'Peter boy tall boy'		S
49	NS	<u>OK</u> (nods) (.) peter is a boy and he's a tall boy that's right		A S
50	NS	so what else did peter have? (.) have a look in here (point)	points to device screen	QW I
51	AS		accesses device and changes page then highlights symbol	RI
52	NS	mmhmm		A
53	AS	'cat'		RW
54	NS	he did have a cat well done we've named him garfield haven't we		A Pr Co
55	AS		highlights symbol	RW
56	NS	[yeh]		A
57	AS	['parrot']		RW
58	NS	and a parrot (.) he did		A
59	AS		clears parrot from device	
60	NS	<u>HE DID HAVE A PARROT</u> (nods) (.) the story wasn't about		A



		his parrot but he has got a parrot hasn't he		Ex
61	NS	so can you tell me something that happened in the story (.) what happened?		QW QW
62	NS	do you want some help to get back or are you going to get back yourself		QCH
63	AS	'no' (shakes head) (.) [(*vocalisation)]		RN
64	NS	[no] (.) <u>YOU WANT SOME HELP TO GET BACK (.) YOU CAN GET BACK YOURSELF</u>	holds up hands to represent each choice	A QCH
65	AS		looks at hand representing get back herself	RCH
66	NS	well done (.) ok (.) just this one (point) (.) or this one if you wanna look for a different object (point)	points to device screen points to device screen	Pr A Ex
67	AS		accesses device and moves a page back	A
68	NS	'yes' (nods) well done (.) so what what happened in the story?		A Pr QW
69	AS		looks around vocabulary on device page	
70	NS	if you're looking for something that he did it's a blue one (point) or if you're looking to describe something else about him it could be the green ones (point) alright	points to device screen points to different area on device screen	Ex C
71	AS	'climb'		RW
72	NS	he climbed (.) did he? (.) what did he climb? you should find it in that one (point)	points to device screen	A C QW Ex
73	AS		highlights symbol NS is pointing to	A
74	NS	that's it		A
75	AS		changes page	
76	NS	ah what did he climb?		QW
77	AS	'tree'		RW
78	NS	he climbed the tree (.) why did he have to climb the tree?		A QW
79	AS	'cat'		RW
80	NS	ah the silly cat was up there was it (.) ah what happened (.) now I'm not sure if this is on here or not but we can have a little look (.) what happened when he climbed up the tree? (.) so he		A QW Co QW

		climbed up the tree to get his cat (..) what happened when he climbed up the tree?		S QW
81	AS		accesses device and changes page back	RW
82	NS	well done (.) lovely green face (.) I'm thinking of in there (points to device) (.) i don't know it might not be in there (.) i think it is i can't remember i did it ages ago		Pr Ex Co
83	AS		highlights symbol but moves gaze before it's selected	A
84	NS	unlucky (.) you've come <u>FORWARD</u> slightly that's why you've got a red face	uses hand to gesture 'forward'	A Ex
85	AS		accesses device and changes page	
86	NS	no it's not there is it		Co
87	AS	[(*vocalisation)]	accesses device to move page back	A
88	NS	[oh] (.) ok i was thinking that he got stuck up the tree didn't he (.) is that what you were looking for?		A In C
89	AS	'yes' (nods)	looks at NS	RY
90	NS	yeh (.) ok right so we know he got stuck up the tree then what happened?		A S QW
91	NS	he got stuck up that tree (.) what did he do?		S QW
92	AS		accesses device	
93	NS	hmm		A
94	AS		accesses 'rest' button	
95	NS	you having a little rest (.) that's fine you can have a little rest (.) are you thinking about it? (.) do you want to have a look at the page?		A Co QYN QYN
96	AS	'yes' (nods)	looks at NS	RY
97	NS	yeh (.) <u>LET ME SEE</u> (..) so (.) there he is climbing up the tree (point) (.) then the next page oh there he is look at the tree (.) oh look at his face (point) (.) how d'you think he might be feeling? (.) does he look happy in that in that picture?	picks up story book and opens points to page in book points to page	A Co Ex I I QW QYN
98	AS	'no' (shakes head slightly)		RN
99	NS	looks a long way up doesn't it		Co
100	AS	'yes' (nods)		RY
101	NS	mmm (..) do you want to tell me		A

		how he's feeling or d'you want to go to the next page? (.) up to you		QCH Co
102	AS		accesses device and removes 'rest' feature then moves between two symbols	RCH
103	NS	mmm		A
104	AS		highlights symbol but moves gaze before selecting	
105	NS	ooh unlucky S good girl		A Pr
106	AS		again highlights symbol but moves gaze before selecting	
107	NS	oh a bit longer		A Ex
108	AS	'shocked'		RCH
109	NS	he looks a bit shocked doesn't he (.) and a bit scared maybe up in that high tree (point)	points to page	A Co
110	NS	wanna see the next page? (.) or can you remember now what happened next? (..) remember?		QYN QYN C
111	AS	'no' (shakes head)		RN
112	NS	no you wanna see (.) you ready then? (.) a SNEAKY PEAK quick (.) (repeats flicking the page) quick (.) <u>THERE YOU GO</u>	flips page to next page and back quickly turns page properly	A C I I Co
113	NS	right so [what happens?]		QW
114	AS	[( <i>*vocalisation</i> )]	accesses device and selects 'rest' button	RW
115	NS	i'm not sure		Co
116	AS	( <i>*vocalisation</i> )		NPC
117	NS	maybe have a look in the more actions it might be on there (..) if not i'll give you some choices alright	points to device screen	I Ex
118	AS		accesses device and removes 'rest' feature	RI
119	NS	that's it well done good girl		A Pr
120	AS		accesses device and changes page	RI
121	NS	spot on well done (..) oh there's stuck (.) i never saw that before there's <u>STUCK</u> (point) remember that ah what did he do? (.) it's there (.) it's <u>ON THAT PAGE</u> can you see it? SHOUT	points to device screen gestures around device screen with hand puts hand to mouth as if shouting	Pr Co QW Ex QYN

122	AS		highlights symbol	RY
123	NS	mm		A
124	AS	'hold'		RW
125	NS	he is he's holding on for dear life isn't he (point) (.) in that tree (.) and what else is he doing? SHOUTING HELP (.) look at his mouth (.) <u>WHAT ELSE IS HE DOING?</u> (..) help (.) what's he doing?	points to page points to word help on page points to word help on page then puts hand to mouth as if shouting	A QW I QW In QW
126	AS	'shout'		RW
127	NS	he's shouting isn't he (.) that's right he's shouting for some help		A Co
128	AS	'Peter boy tall boy cat parrot climb tree cat shocked hold shout'		S
129	NS	(*laughs) remember what happened next? (..) you wanna go back just do that one (point)	points to device screen	QYN Ex
130	AS		selects wrong symbol and goes to home page	A
131	NS	it doesn't matter i'll get you back if you go there that's the right one	selects buttons and changes back to correct vocabulary	A Ex
132	AS	(*vocalisation)		RH
133	NS	cos you are working very very well there you go		Pr Co
134	NS	so what happened next can you remember? (..) he <u>SHOUT</u> /ed for some help didn't he (.) did anybody here him?	gestures shouting by putting hand to mouth	QW S QYN
135	AS	'yes' (nods slightly)		RY
136	NS	did any somebody hear him? (.) he might have been out <u>WATERING</u> his plants	gestures watering plants	QYN Co
137	AS	'yes' (nods)		RY
138	NS	yeh can you remember who saw him?		A QYN
139	AS		looks at book then NS	RH
140	NS	what d'you wanna do d'you wanna go to the next page?		QYN
141	AS	'no' (shakes head)		RN
142	NS	you wanna clue?		QYN
143	AS	'no' (shakes head)		RN
144	NS	no (.) ok i'll put the book down go on	puts book down	A Co I

145	AS		corrects posture and sits up	RI
146	NS	good girl well done		Pr
147	AS		accesses device and changes page	
148	NS	mm i'm surprised that's not there actually (.) english (.) is what you're looking for not there S? (.) are you looking for something but you can't find it?	accesses device and changes pages looks at AS	Co Co QYN QYN
149	AS	'boy'		RW
150	NS	are you looking for a man?		QYN
151	AS		*'unknown aac output'	NPC
152	NS	is that what you're looking for a man?		QYN
153	AS	'yes' (nods)		RY
154	NS	yeh (.) i couldn't see it either (..) we've only got old haven't we (point)	points to device screen	A Co Co
155	NS	so (.) so a man heard him what did the man do? (..) you might have to look in the more objects (point) (.) i think it's in there (..) obviously you'll have to have your head in a better position than that (laughs)	points to device screen	R QW Ex I
156	AS		sits up and re-positions head	RI
157	NS	good girl well done (.) look at that beautiful (.) so if you go into the more objects and see if you can find what the man did (point)	points to device screen	Pr Co I
158	AS	'scared'		RI
159	NS	who was scared the man or the boy? (.) <u>THE MAN OR THE BOY</u>	taps AS' hands in turn to represent each choice	QCH QCH
160	AS		looks to her hand that represents boy	RCH
161	NS	the boy (.) he was wasn't he up that tall tree		A A
162	AS		struggles to access device then looks at NS	RH
163	NS	d'you want some help?		QYN
164	AS	'yes' (nods)		RY
165	NS	where are you trying to go into more objects?		QYN
166	AS	(*VOCALISATION) (nods)		RY
167	NS	yes	accesses device and	A

		(..) have a look and see is it on this page (point) or you've got more on that page	changes page points indicating symbols on page	I Ex
168	NS	oh look there's man he's there look (point)	points to device screen	Co
169	AS		looks at NS	
170	NS	there he is in the middle there (point) (..) is what you want on there?	points to device screen	Co QYN
171	AS	'no' (shakes head)		RN
172	NS	no (..) are we gonna have a little look in this one? (poont)	points to device screen	A I
173	AS		sits up, accesses device and changes page as suggested by NS	RI
174	NS	good girl		Pr
175	NS	ah (..) is what you were looking for there?		QYN
176	AS		looks at device screen	RY
177	NS	you're looking at it aren't you but you're looking at it wonky		A Ex
178	AS	'mum'	sits up	In
179	NS	mum (..) he did eventually go home to mum [didn't he]		A A
180	AS	['scared']	accesses device and clears mum	RN
181	NS	were you trying to get this one next door? (point)	points to device screen	QYN
182	AS	'yes' (nods)	looks at screen	RY
183	NS	yeh		A
184	AS	'mum' (..) [scared]	accesses device and clears mum	In
185	NS	[that's the one] good girl (..) try again		A Pr I
186	AS	'ladder'		RI
187	NS	that's right he did use a ladder didn't he (..) d'you want me to take you back to your main page?		A QYN
188	AS	'yes' (nods)	maintains eye contact	RY
189	NS	yeh (..) right so he got his ladder and what did he do?	accesses device and changes page	A Co QW
190	AS		accesses device and highlights object	RW

191	NS	mmm		A
192	AS	'boy'		RW
193	NS	ah so he got his ladder so he could get up to the boy is that right? (.) so did he leave the boy in the tree and just get the cat (.) did he (.) get the boy and just or did i just say that? (.) what did i just say? (.) oh no yeh <u>DID HE LEAVE THE BOY AND GET THE CAT (.) DID HE LEAVE THE CAT AND GET THE BOY (.) OR DID HE JUST GO UP TO SAY HELLO AND LEAVE THEM BOTH IN THE TREE?</u>	raises hands and indicates head to represent each choice	A C Co Co A QCH
194	AS		looks at NS then looks to hand representing 'just got the cat'	RCH
195	NS	he just got the cat (.) NO he got em both didn't he he got them both down shall we have a little <u>LOOK</u> (..) now there he is look (.) oh yeh there he is look (.) (point) he's got his hosepipe hasn't he watering his garden (.) there we are he gets both of them down doesn't he (point) (.) then what does peter do? (.) he comes down and he's safe and sound isn't he	nudges AS' hand  picks up picture book turns page points to page  turns page  points to page	O Co Co Co Co QW Co
196	AS		accesses device and changes page accidentally	
197	NS	(.) and then (..) i can't remember what page we were on	changes page back	Co
198	AS		looks at book	
199	NS	he says		QC
200	AS	(*vocalisation)	looks up and clears message window by accident	Co
201	NS	that's alright it doesn't matter		A Ex
202	NS	you've lost your (point) (.) face S	points to device screen	I
203	AS		sits up and repositions head	RI
204	NS	good girl		Pr
205	AS	(*vocalisation)		RI
206	NS	well done		Pr
207	AS		looks around device screen and highlights symbol then moves	In

			away	
208	NS	do you need some help to get in there you getting tired?		QYN
209	AS	'yes' (nods)	gives eye contact	RY
210	NS	yeh (.) so are you trying to get into this one? (point)	points to device screen	A QYN
211	AS	'yes' (nods)		RY
212	NS	yeh? (.) is it on that page or is it on the more page? (point)	accesses device and changes page points to device screen	C QCH
213	AS	(*vocalisation)		RCH
214	NS	the more page (.) is it?		A C
215	AS	'yes' (nods)		RY
216	NS	yeh (.) ah what did he do?	accesses device and changes page	A QW
217	NS	so he got down and said thank you to the man didn't he (.) then what did he say? (.) what did he do?		S QW QW
218	AS		accesses device and selects clear although the message window is already clear	
219	NS	hmm unlucky		A
220	AS		selects 'speak' command on device	In
221	NS	it's all gone mate (.) but that's fine (.) what was the last thing he did?		A Ex QW
222	AS		highlights symbol	RW
223	NS	'yes' (nods) that's right good girl		A Pr
224	AS		struggles to select symbol	RW
225	NS	it's cos your arms dropped hasn't it		Ex
226	AS		moves arm up onto tray	A
227	NS	good girl well done you're doing really well		Pr
228	AS		arm moves away but as repositions it onto table	
229	NS	you got it? (.) that's it brilliant		C Pr
230	NS	right (.) he got down from the tree with his cat (.) said thank you to the man then what did he do?		R S QW
231	AS		repositions arm on	



			tray	
232	NS	good girl (..) (*unintelligible speech)		Pr NPC
233	NS	is this the page you want?		QYN
234	AS	'yes' (nods)	gives eye contact	RY
235	NS	yeh (.) ok just checking i hadn't put you on the wrong one		A Ex
236	AS		selects symbol and changes page	A
237	NS	oh i didn't see that one (.) oh (..) that's the (*unintelligible speech)		Co Co
238	NS	if you go back (pont) it'll go back to that page with the four red ones across if that's the one you want	points to device screen	Ex
239	AS		selects symbol and changes page	A
240	NS	good girl		Pr
241	AS	'lady'		RW
242	NS	he did (.) he went (.) he went to see a lady (.) d'you know who that lady was?	turns page	A Co QW
243	AS		looks at NS	C
244	NS	'yes' (nods) she is a lady though you're right (.) who d'you think that lady is?		A Ex QW
245	AS	'lady'		RW
246	NS	mmhmm		A
247			**knock on door NS goes and tells people to come back later**	
248	AS	'lady'		RW
249	NS	she's a lady yep (..) are you trying to get to this one? (point)	points to device screen	A QYN
250	AS	'yes' (nods)		RY
251	NS	would you like me to select it?		QYN
252	AS	'yes' (nods)		RY
253	NS	you've worked really hard (.) 'mum' (.) it's mum isn't it (..) have you had enough?	selects symbol on device	Pr In A QYN
254	AS	'yes' (nods)		RY
255	NS	yeh you've done really really well cos you got all the key bits of that story in there didn't you		A Pr Co

## Appendix C4.6

### Participant S: Session Three Personal Narrative - Pets

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	how about you have you got any pets?		QYN
2	AS	(*VOCALISATION) (nods)		RY
3	NS	(nods) <u>YEH</u>		A
4	AS	'yes' (nods)		A
5	NS	are they on there? (point)	points to device	QYN
6	AS		looks to device screen	
7	NS	what have you got? (..) d'you want me to bring that arm up? (point)	points to AS' arm	QW QYN
8	AS	(*vocalisation)		RY
9	NS	tell it to and then i'll help you		I Ex
10	AS	turns toward arm (*vocalisation)		RI
11	NS	that's right you tell it		A
12	AS	(*vocalisation)		RI
13	NS	it's coming good girl (..) d'you need a hand with it?		A Pr QYN
14	AS	(*vocalisation)		RY
15	NS	yeh	moves to assist AS in repositioning her arm	A
16	NS	right ready tell it then (..) up it comes (.) and bring that one round (.) bring that one round to meet him		R I Co I
17	AS	[(*vocalisation)]	gives eye contact and smiles at NS	RI
18	NS	[that's it] good girl well done		A Pr
19	NS	ok (.) so (..) have you got a pet at home?		R QYN
20	AS		accesses device	
21	NS	there's some here (point) (*unintelligible speech) (.) there might be some more in the more objects (.) have you got one of these or not? (point)	points to device screen  points to device screen then looks at AS	Ex Ex QYN

22	AS	'no' (shakes head slightly)		RN
23	NS	no (.) look (point) that's not picking you up you've got got your head forward too much (.) bring it back a little bit HERE	points to screen	A
			taps headrest of wheel chair	Ex I
24	AS		sits up and moves head back	RI
25	NS	that's it (.) back a bit more and it should go green		A I Ex
26	AS		moves head back more	RI
27	NS	'yes' (nods) good girl		A Pr
28	AS		accesses device and changes page	
29	NS	mmhmm		A
30	AS		accesses device and change to home page	
31	NS	do you want me to get you back to the story?		QYN
32	AS		accesses device and changes page	RN
33	NS	oh you're going to do it yourself well done (.) (point) it's english (.) <u>THIS ONE</u> (..) this one	points to device continues to point to device screen	A Pr Ex
34	AS		accesses device and changes page but not to that indicated by NS	
35	AS		highlights symbol but moves gaze before it is selected	
36	NS	ooh tiny bit longer (.) you've lost your face look (point)	points to device screen	A I Ex
37	AS		sits up in wheel chair	RI
38	NS	good girl (..) well done	places hand onto AS'	Pr Pr
39	AS		accesses device and changes page	
40	NS	good (.) english that one in the middle there (point)	points to device	Pr Ex
41	AS		accesses device and highlights incorrect symbol	
42	NS	you like communication today (.) this one (point)	points to device screen	Co I
43	NS	it's gone again look your heads come forward (point)	points to device screen	Ex

44	AS		sits up and accidentally selects symbol which changes page	RI
45	NS	(*laughs) errrm (point) [english]	points to device	A I
46	AS	<i>['history']</i>		RI
47	NS	argh (.) oh this is just your timetable page let's go back (point) (.) go back to your home (.) go back to the (.) whichever one doesn't matter	points to device screen and continues while speaking	A Ex I Ex
48	AS		accesses device and selects symbol to change page	RI
49	NS	would you like some help to get to the page?	looks at AS	QYN
50	AS	'yes' (nods)	gives eye contact	RY
51	NS	yeh (..) so it's in english (.) story-telling (.) pets (.) ok?	accesses device and changes page accesses device and changes page accesses device and changes page	A Co C
52	NS	there's quite a few steps isn't there		Co
53	NS	right so have you got any of these animals? (point) or is there (.) there might be some [more in more objects]	points to device screen	R QYN Ex
54	AS	<i>[(*vocalisation)]</i>	moves arm into position and highlights symbol	RN
55	NS	ok		A
56	AS		accesses device and changes page	
57	NS	well done		Pr
58	AS		highlights symbol	
59	NS	ah		A
60	AS	<i>'fish'</i>		In
61	NS	you've got fish (.) have you (..) <u>ARE THEY LIKE GOLD FISH (.) OR FANCY FISH?</u>	holds up a hand to represent each choice	A QCH
62	AS		looks to hand representing goldfish	RCH
63	NS	goldfish have you (.) how many have you got? (*unintelligible speech) how many have you got (.) can you find your numbers?		A QW QW QYN
64	AS	<i>(*vocalisation)</i>		RY
65	NS	<u>DO YOU WANNA FIND YOUR NUMBERS OR DO YOU WANT ME TO GIVE YOU SOME</u>	holds up a hand to represent each choice	QCH

		CHOICES?		
66	AS		looks at hand representing find numbers	RCH
67	NS	go on then go find your numbers (.) it's [all in maths]	repositions AS hand	I Ex
68	AS	[(vocalisation)]	holds eye contact with NS	A
69	NS	you want <u>ME</u> to find your numbers?	points to self	C
70	AS	'no' (shakes head)		RN
71	NS	you're gonna find them (.) then you need (point)	points to device	A I
72	AS		highlights a symbol	RI
73	NS	you could go (.) yeh you could go back or you could go home it doesn't matter (.) you choose		A Ex
74	AS		struggles to bring right arm onto tray	
75	NS	that's it good girl (.) well done		Pr Pr
76	AS		accesses device and highlights symbol	
77	NS	right at the top well done		Ex Pr
78	AS		selects symbol that moves back one page	A
79	NS	ooh and back again (point)	points to device screen	I
80	AS		highlights but then moves away from desired symbol	
81	NS	ooh (point)	still pointing at device screen	A
82	AS		selects different symbol	
83	NS	that's fine you can do that one (.) but you'll have to go back into timetable (.) that one there look (point)	points to device screen	A Ex
84	AS		highlights correct symbol then changes page	A
85	NS	good girl (.) and then this one this time (point)	points to device screen	Pr I
86	AS		highlights correct symbol and changes page	RI
87	NS	well done (.) and numbers (point)	points to device screen	Pr I

88	AS		struggles to access device	RI
89	NS	this one here look	still pointing at device screen	I
90	AS	(*vocalisation)		RH
91	NS	there's you're little dot look (point) (.) it's this one here (point)	points elsewhere on device screen points to device screen	Ex Ex
92	AS		accesses device and changes page to the wrong one	A
93	NS	ooh unlucky i'm gonna get you back there cos you did get there (.) there you go this one (point)	accesses device and changes pages points to device screen	A Ex I
94	AS		struggles to access device then changes to wrong page	RI
95	NS	you've lost your arm haven't you	accesses device and changes back to correct page	Co
96	AS		highlights correct symbol but moves away before selecting	RI
97	NS	ooh so close (point)	points to device	A
98	AS	[(*vocalisation)]	looks at NS	RH
99	NS	[(nods) <u>YEH</u> i think you] i think you had that (.) right is that enough <u>UP TO TEN?</u> (.) or that's up to twenty in <u>THAT ONE</u> (.) how many have you got?	accesses device and changes page gestures around device screen points to device screen	A Co QYN Ex QW
100	AS		moves head position to access device	
101	NS	good girl well done		Pr
102	AS	'five'		RW
103	NS	you've got 5 (.) in your tank	looks at AS	A
104	AS	(*VOCALISATION) (slight shake of head)		RN
105	NS	yes?		C
106	AS	'no' (shakes head)		RN
107	NS	no? (..) <u>YES YOU'VE GOT 5</u> (.) <u>NO YOU HAVEN'T</u>	holds up a hand to represent each choice	C QCH
108	AS		looks at hand representing no	RCH
109	NS	have you got more than 5? (.) d'you think? (.) <u>MORE THAN 5</u> (.) <u>LESS THAN 5</u>	holds up a hand to represent each choice	QYN C QCH
110	AS		looks at hand	RCH

			representing less than 5	
111	NS	less than 5 (.) so it'll be on this <u>TOP ROW</u> (.) can you get your head up	indicates top row of symbols on device with hand	A Ex I
112	AS		lifts head	RI
113	NS	good girl		Pr
114	AS	(*vocalisation)	AS' right arm moves away	Co
115	NS	you tell it		I
116	AS		moves arm onto tray	RI
117	NS	that's it well done		A Pr
118	AS	(*vocalisation)	looks at left arm	Co
119	NS	and that one yeh		I
120	AS		moves arm onto tray	RI
121	NS	good girl (..) you do know you can just make it up cos i don't know how many fish you've got (*laughs)	shrugs shoulders	Pr Ex
122	AS		looks at NS	A
123	NS	got 5? 'yes' (nods)		C
124	AS	(*vocalisation)		RY
125	NS	yeh (*laughs) (.) yeh shall we go back to the other page now then		A I
126	AS	'yes' (nods slightly)		RY
127	NS	so is that what you've got just some some goldfish at home are they in <u>YOUR</u> room (.) or are they in another room in the house? (..) <u>YOUR ROOM</u> (.) <u>ANOTHER ROOM IN THE HOUSE</u>	points to AS  holds up hand to represent each choice	QYN QCH QCH
128	AS		continues to look at NS and does not select either choice	RCH
129	NS	<u>IN YOUR BEDROOM OR IN A DIFFERENT ROOM</u>	moves each hand to show which represents each choice	QCH
130	AS		continues to look at as and does not select either choice	RCH
131	NS	<u>OR ARE THEY OUTSIDE?</u> (.) have you got a pond rather than a fish tank	points to her own chin	QYN QYN
132	AS	'yes' (nods slightly)		RY
133	NS	ahh i see (.) a pond?		A C
134	AS	'yes' (nods slightly)		RY
135	NS	yeh (nods) (.) in the garden		A C

136	AS	'yes' (nods slightly)		R Y
137	NS	oh very nice (.) cool (.) right well I think we've done that bit		A C o



## Appendix 4.7

### Participant S: Session Four Fictional Narrative – The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	so (.) d'you think you can tell me (.) that story?	gives eye contact to AS	QYN
2	NS	d'you think you could tell me that story or a story about that squirrel? (...) yes or no?		QYN QYN
3	AS	'yes' (nods)	gives eye contact	RY
4	NS	yes (..) d'you wanna use the book? (..) or just your memory? (..) or your imagination?		A QYN QCH
5	NS	<u>D'YOU WANNA USE THE BOOK (.) YOUR MEMORY OR IMAGINATION</u>	holds out hand to represent each choice	QCH
6	AS		looks to hand representing use the book	RCH
7	NS	yeh you can use the book (.) well i think you can i've decided you can (laughs)	briefly looks at researcher	A Co
8	NS	here you go if i leave that <u>THERE</u> (.) you have a look at the <u>PICTURES</u> (.) and you see if you can tell me that story	opens book and places on tray in front of AS gestures around page with finger	R I
9	NS	what can you see in that picture? (..) where's that other arm gone s?	looks round to AS' arm	QW I
10	NS	UP tell it to (.) get itself <u>UP</u> here	gestures up with head gestures up with head	I
11	AS	(*vocalisation)	moves arm onto tray	RI
12	NS	you tell it (.) good girl (..) that's it well done (..) okay there you go		A Pr Pr Co
13	AS	(*vocalisation)		A
14	NS	you've lost your face (.) look (point)	points to device screen	Ex I

15	AS	(*vocalisation)		A
16	NS	you've just got a big cross there		Ex
17	AS	(*vocalisation)	sits up	RI
18	NS	so (.) where we gonna go first		R QW
19	AS	(*vocalisation)	struggles to access device	RW
20	NS	oh good girl (.) lovely green face		Pr Co
21	AS		highlights but moves gaze from symbol before selecting	
22	NS	oh a bit longer (.) you need to bring your head a little bit more back towards me (point)	points to device screen	A Ex I
23	AS		moves head	RI
24	NS	that's it good girl		A Pr
25	AS		highlights but moves gaze from symbol before selecting	
26	NS	oooh		A
27	AS		highlights but moves gaze from symbol before selecting then looks at NS	RH
28	NS	uh getting closer	gives eye contact	Co
29	AS		struggles to access device	
30	NS	you see the red dot that's where you're actually looking (point) (..) you need to come <u>DOWN</u> a bit (.) come down to here (..) that's it	points to device screen points then gestures down screen with hand	Ex I I A
31	AS		highlights but moves gaze from symbol before selecting	RI
32	NS	right i'm gonna select that for you cos you've been on that 3 times now	looks at AS	A Ex
33	AS	['yes' (nods)]	gives eye contact	RY
34	NS	[so i know] that's the one you want right there you go (..) it's the afternoon so you're tired aren't you	selects symbol on device	Ex R Co
35	NS	so what can you see? (.) is it on this page? (..) or you've got more (point) (.) in there	points to device screen	QW QYN Ex
36	AS		lifts head and looks	

			at device screen	
37	NS	having a good look round aren't you		Co
38	AS	'giant'		RW
39	NS	giant?		O
40	AS		accesses device and tries to delete word	RN
41	NS	that's exactly where you're looking but not picking you up is it (..) are you looking at <u>THIS</u> ? (point)	points to 2 specific buttons on device	A Co QYN
42	AS	'giant'		RW
43	NS	giant (..) want giant?		A QYN
44	AS	'no' (shakes head)		RN
45	NS	trying to get to that one aren't you		Co
46	AS		accesses device and deletes word	
47	NS	that's it (..) good girl you trying to get in there? (point)	points to device screen	A Pr QYN
48	AS		accesses device and highlights symbol	RY
49	NS	good girl		Pr
50	AS		highlights symbol twice but moves gaze before selecting	
51	NS	alright good girl (..) have we gone onto a different page do you think? (..) or do we need to go back (point) (..) and look in one of the other (..) pages for this story?	accesses device and selects symbol to change page points to device screen	A Pr QYN QYN
52	AS		highlights symbol to move a page back	RY
53	NS	good girl		Pr
54	AS		attempts to highlight 'back' symbol but highlights incorrect symbol and so moves head away	
55	NS	good looking away well done		Pr
56	AS		struggles to access device then yawns and looks at NS	RH
57	NS	d'you want some help to get back (..) then you choose the page?	makes eye contact	C
58	AS	[(* <u>VOCALISATION</u> (nods))]		RY

59	NS	[that alright?] (.) back you go (.) back you go	accesses device and changes page	C
			accesses device and changes page	Co
60	NS	(point) so you went in there and it wasn't in there what you're looking for was it (.) so it's either gonna be an action (point) (.) or a or a item a thing (makes hand gesture) (.) an object	points to device screen	Ex
			points to device screen	
61	AS		struggles to access device then highlights but moves gaze from symbol before selecting	
62	NS	you're trying so hard aren't you		A
63	AS		accesses device and changes page	
64	NS	that's your actions		A
65	AS		looks around screen then drops head	
66	NS	<u>D'YOU WANT MORE ACTIONS OR BACK?</u>	points to options on device screen to indicate choices	QCH
67	AS		highlights symbols around 'more actions'	RCH
68	NS	more actions (.) that where you're trying to go? (.) hmm?		A
				C C
69	NS	if you get on it i'll help you select it ok?	looks at AS	I C
70	AS		yawns and looks at NS	
71	NS	that alright?		C
72	AS	'yes' (nods)		RY
73	NS	yeh		A
74	AS		highlights correct symbol	RI
75	NS	alright (..) that's more actions (.) d'you want that one yet?	accesses device and changes page	A
				Ex QYN
76	AS	'yes'		RY
77	NS	ok go on then		A
				I
78	AS		involuntary arm movement moves book to edge of tray	
79	NS	what you gonna tell me	moves book back to centre of tray	QW
80	AS		struggles to access device then looks at book and yawns moving eye contact to NS	

81	NS	oh dear (*laughs)		Co
82	AS		involuntary arm movement slides book onto floor	
83	NS	ooops		Co
84			**researcher picks up book and puts back on tray**	
85	NS	d'you want this page or do you want to say who was in the story first S		QCH
86	NS	<u>YOU WANT THIS PAGE (.)</u> <u>YOU WANT TO SAY WHO'S IN THE STORY FIRST</u>	holds out hand to represent each choice	QCH
87	AS		looks at hand representing say who's in the story	RCH
88	NS	(nods) <u>OK</u> (.) so you need to go back (point) (.) and you need to go to the objects page (.) i think (.) as we haven't been there yet	points to device screen	A I Ex
89	AS		looks at book	
90	NS	are you looking for these characters? (point) (..) is that who you're looking for?	points to parts of book page	QYN QYN
91	AS	(nods) (* <u>VOCALISATION</u> )	gives eye contact	RY
92	NS	(nods) <u>YEH</u> (.) ok right so go back (.) and again (.) are they in there?	accesses device and changes page accesses device and changes page	A Co QYN
93	AS	'yes' (nods slightly)		RY
94	NS	ah (..) you have to remember don't you there's lots of things to remember		A Co
95	NS	(*? comment made re. AS and accessing device)	speech too quiet to understand	Co
96	AS		highlights but moves gaze from symbol before selecting	
97	NS	ok		A
98	AS		highlights but moves gaze from symbol before selecting	
99	NS	oh you selected that [i'll let you have that]	accesses device	A Co
100	NS	['squirrel'] (.) the squirrel what about the squirrel		In A QW
101	AS	'tree'		RW
102	NS	in the tree yep (.) they are aren't they look (point) they're up in the tree good (.)	points to page of book	A I Co

		anything else?		QYN
103	AS	(*vocalisation)	tries to access device	RY
104	AS		highlights but moves gaze from symbol before selecting	
105	NS	oh unlucky S		A Co
106	AS	(*vocalisation)	highlights symbol	
107	NS	good girl (.) keep going		Pr I
108	AS	(*vocalisation)		RI
109	NS	where's that other arm gone?		I
110	AS		highlights but moves gaze from symbol before selecting then	RH
		(*vocalisation)		
111	NS	that's the third time (.) 'mummy squirrel'	accesses device	A Co In
112	NS	the mummy squirrel yeh (..) anything else on that page?		A QYN
113	AS	'YES' (point)	looks at book and points to part of page	RY
114	NS	what you showing me? (.) the fence (..) the fence?		QW A C
115	AS	'YES' (point)	continues pointing to page and smiles	RY
116	NS	are you remembering what's happening in the story (*laughs)		QYN
117	NS	so what you gonna what you wanna say? (point) (..) you're right there is a fence there	points to device screen	QW Co
118	AS		struggles to access device	
119	NS	you seem to be looking right at it but look it's not picking you up honey (point)	points to device screen	Ex
120	AS		sits up and moves arm	RI
121	NS	get that other arm up good girl		I Pr
122	AS		highlights but moves gaze from symbol before selecting then highlights symbols around desired place	
123	NS	you're trying to get in there aren't you (point)	points to device screen	QYN

124	AS	'tree'		In
125	NS	yep (.) so there's a squirrel in the tree and a mummy squirrel in the tree yep		A S
126	AS		accesses device and changes page	
127	NS	ah (..) can you see what you wanna say?		A QYN
128	AS	THAT	looks at book and points to page with hand	In
129	NS	that's right (.) mummy squirrel and a squirrel in a tree yeh (.) what's next?	leans over and looks at what AS is pointing too	A S QW
130	NS	d'you want me to turn the page?		QYN
131	AS		looks at NS	
132	NS	<u>WANT TO STAY ON THAT PAGE (.) YOU WANT ME TO TURN THE PAGE</u>	holds up hands to represent each choice	QCH
133	AS		looks to hand representing turn the page	RCH
134	NS	want me to turn it (.) ok (.) oh ready (.) there we go what's happening now? (point)	reaches for book turns page points around page	A R Co QW
135	AS		looks at page then sits up and repositions arm	
136	NS	good girl well done		Pr
137	AS		looks at device then NS	
138	NS	<u>GOOD</u> girl	makes eye contact and gives thumbs up gesture	Pr
139	AS		highlights but moves gaze from symbol before selecting then looks at NS	RH
140	NS	was that a deliberate choice?	gives eye contact	C
141	AS	'yes' (nods)	gives eye contact	RY
142	NS	ok (.) [ball] [there is] a ball (.) what else is there?	accesses device	In A QW
143	AS		highlights but moves gaze from symbol before selecting	
144	NS	oh unlucky S		Co
145	AS		struggles to access device and repositions head	
146	NS	lovely green face		Co

147	AS		highlights but moves gaze from symbol before selecting	
		(*vocalisation)		
148	NS	mmm you are trying so very hard		A Pr
149	AS		highlights but moves gaze from symbol before selecting	
150	NS	good (.) [ <i>mouse</i> ] [mouse] (.) anybody else?	accesses device	Pr In QYN
151	AS		accesses device and it freezes slightly having highlighted the desired symbol	
152	NS	it's thinking about it		Ex
153	AS		repositions head and accesses device	
154	NS	that's it well done		A Pr
155	AS		struggles to access device, yawns	RH
156	NS	d'you keep going round the one you want?		QYN
157	AS	(nods)		RY
158	NS	yeh		A
159	AS	<i>ball</i>		In
160	NS	that's it there's the a mouse and the ball (..) and the squirrel obviously		A S
161	AS		[(yawns and looks at NS)]	
162	NS	[anything else?] (.) or do we want the next page?	gives eye contact	QYN QYN
163	NS	<u>STAY ON THIS PAGE (.) NEXT PAGE</u>	holds up a hand to represent each choice	QCH
164	AS		looks at hand representing next page	RCH
165	NS	you want the next page (.) right ready then		A R
166	AS		involuntary arm movement rips book slightly	
167	NS	oops a daisy (..) oh I know why you want this page	takes book and looks at next page looks at AS	A Co
168	NS	there we go (.) can I help you to lift your head up (.) alright (.) good girl	places book back on tray assists as to reposition head	R C A Pr
169	NS	ah so what's happening now		QW



		then?		
170	AS		looks at device screen then book	
171	NS	you trying to turn over?		QYN
172	AS		looks at NS	RN
173	NS	yeh (.) trying to turn over?	gives eye contact	C
174	AS	'no' (shakes head)		RN
175	NS	no ok		A
176	AS		struggles to access device	
177	NS	think you're a little bit too far forward S		Ex I
178	AS		sits back in chair	RI
179	NS	good girl (.) i can see you peeking look		Pr Co
180	AS		moves head	
181	NS	(*laughs) that's it well done		A Pr
182	AS		highlights but moves gaze from symbol before selecting	
183	NS	clicked on that didn't you (.) stay on it for a bit longer		A I
184	AS		struggles to access device then yawns	RI
185	NS	which one of those two did you want?		QCH
186	AS	(*vocalisation)	looks at NS	RCH
187	NS	<u>DID YOU WANT ONE OF THOSE TWO (.) OR BOTH OF THOSE TWO?</u>	holds up a hand to represent each choice	QCH
188	AS		looks at hand representing both	RCH
189	NS	you want both (.) d'you want some help?		A QYN
190	AS	'yes' (nods)	keeps eye contact	RY
191	NS	yes (.) you do want some help (..) (point) who do you want first? (.) RABBIT FIRST (.) FENCE FIRST	points to device screen holds up a hand to represent each choice	A QW QCH
192	AS		looks at hand representing fence	RCH
193	NS	fence first (.) ['fence'] [ok] (.) so then you want rabbit (.) 'rabbit' (.) ok	accesses device  accesses device	A In Co In A
194	NS	he is by the fence that's right (..) anything else on that page?		Co QYN
195	AS	'no' (shakes head slightly)	looks at NS	RN

196	NS	anything else on that page?		QYN
197	AS	'no' (shakes head)	maintains eye contact	RN
198	NS	no (.) turn the page?		A C
199	AS	'yes' (nods)	maintains eye contact	RY
200	NS	there we go	turns page	R
201	AS		highlights but moves gaze from symbol before selecting	
202	NS	good girl		Pr
203	AS		AS repositions herself	
204	NS	that's it (..) good		A Pr
205	AS		struggles to access device	
206	NS	you're looking straight at it aren't you (.) think you're a little bit too close S (..) can you get your head back a little bit		Co Ex I
207	AS		moves head back	RI
208	NS	that's it (..) good girl		A Pr
209	AS		struggles to access device	
210	NS	back a tiny bit		I
211	AS		moves head	RI
212	NS	that's it		A
213	AS		accesses device	
214	NS	that's it lovely green face (..) try and look at the one you want		A Ex I
215	AS		struggles to access device then looks at NS	RI RH
216	NS	is it messing about		QYN
217	AS	'yes' (nods)	maintains eye contact	RY
218	NS	'yes' (nods) would you like me to be your scanner?		A QYN
219	AS	(nods [*VOCALISATION])		RY
220	NS	[and] tell me when to stop		QYN
221	AS	(nods) (*VOCALISATION)		RY
222	NS	shall we try that way?		C
223	AS	'yes' (nods)	maintains eye contact	RY
224	NS	ok (.) is it in this row? (point) (..) <u>THIS ROW?</u> (..) <u>THIS ROW</u>	points to device screen NS scans down rows with finger	A QYN QYN
225	AS	'yes'	looks at NS	RY

226	NS		gives eye contact and keeps finger in place	C
227	AS	'yes' (nods)		RY
228	NS	ok i'm gonna point (point) (.) this one? (.) this one? just let me know i'm on the right one (.) this one? (.) this one?	points to symbols in turn	A Ex QYN QYN I QYN QYN
229	AS	'yes'	looks at NS	RY
230	NS	badger		C
231	AS	['yes' (nods)]		RY
232	NS	[you want badger] (.) 'badger' (.) badger 'yes' (nods) that's true badger has joined them hasn't he	accesses device	A In A Co
233	AS	'yes' (nods)		RY
234	NS	yeh (.) then what happened? (..) d'you want to stay on THIS PAGE? (.) or go to a different page?	gestures around device screen with hand	A QW QYN QYN
235	AS		looks at book	
236	NS	can you see the picture?	moves book slightly	QYN
237	AS		looks at symbols on device screen	
238	NS	good looking around the page well done (.) is what you want on this page?		Pr QYN
239	AS		looks at NS	RN
240	NS	you don't want this page?	gives eye contact	C
241	AS	'no' (shakes head)	maintains eye contact	RN
242	NS	no (.) wanna go back?		A QYN
243	AS	'yes' (nods)		RY
244	NS	got you back (.) right is it on that page that you want or do we need to go back again?	accesses device and changes page	Co R QCH
245	AS		looks at book	
246	NS	just checking aren't you well done		Co
247	AS		looks at device screen	
248	NS	<u>SO IS IT ON THIS PAGE (.) OR WE NEED TO GO BACK AGAIN?</u>	holds up a hand to represent each choice	QCH
249	AS		looks at hand representing this page	RCH
250	NS	it's on this page ok (..) am i		A

		being your scanner again?		QYN
251	AS	'yes' (nods)	gives eye contact	RY
252	NS	yeh (.) ok (.) is it in the top row? (point) (..) <u>IS IT IN THIS ROW?</u> (..) <u>IS IT IN THIS ROW?</u>	points to device screen then scans down with finger to indicate each row	A QYN QYN QYN
253	AS	'yes' (nods)	looks at NS	RY
254	NS	it's in this row ok ready (.) (point) is it this one? (..) is it this one? (..) is it this one? (...) is it this one?	points to symbols in turn	A R QYN QYN QYN QYN
255	AS		looks at NS	RY
256	NS	is it in this row?		QYN
257	AS	'no' (shakes head)	maintains eye contact	RN
258	NS	no		A
259	AS		looks at device screen	
260	NS	<u>IT'S IN THAT ROW (.) IT'S IN A DIFFERENT ROW</u>	holds up a hand to represent each choice	QCH
261	AS		looks at hand representing different row	RCH
262	NS	it's in a different row alright i'll start again (point) (.) is it is it this last row cos we didn't get to this row (.) is it in this row?	points to device screen	A Co QYN
263	AS	'yes' (nods)	looks at NS	RY
264	NS	yes?		C
265	AS		looks at book	
266	NS	yes?		C
267	AS	'yes' (nods)	gives eye contact	RY
268	NS	yes (.) ok (..) (point) so is it (.) flowers (..) (point) or is it rat?	points to symbols points to next symbol	A QYN QYN
269	AS	'yes' (nods)	looks at NS	RY
270	NS	it's rat?		C
271	AS	'yes' (nods)	maintains eye contact	RY
272	NS	rat (.) there you [go] ['rat'] (..) ok so we've got badger rat (.) and rabbit (point)	accesses device  points to characters in book	A Co In S
273	NS	are we on <u>THIS PAGE</u> still?	gestures around page with finger	QYN
274	AS		looks at NS	RN

		(shakes head) (*VOCALISATION)		
275	NS	no you want me to turn the page?		A C
276	AS	'yes' (nods)	maintains eye contact	RY
277	NS	ok (..) oh there we go (..) so what page do we need? (.) do we need an objects page (point) (.) or do we need to go back? (point)	turns page  points to device screen points to device screen	A R QW QCH
278	NS	<u>AN OBJECTS PAGE (.) WE NEED TO GO BACK</u>	holds up a hand to represent each choice	QCH
279	AS		looks at hand representing go back	RCH
280	NS	we need to go back right (.) ok so what page d'you want now (.) (point) objects actions descriptions	points to symbol on screen for each in turn	A QCH
281	AS		looks at device screen	
282	NS	so we know it's not objects cos you've just come from there (.) (point) is it actions that you want?	points to symbol	Ex QYN
283	AS	'no' (shakes head)	looks at NS	RN
284	NS	no (.) so is it descriptions that you want?		A C
285	AS	'yes' (nods)	maintains eye contact	RY
286	NS	yes (.) there you go then	accesses device and changes page	A R
287	NS	get your head up and have a little look first then i'll ask you a question		I Ex
288	AS	'giant'	sits up and repositions head	RI In
289	NS	you like giant don't ya		Co
290	AS	(*laughs)		
291	NS	is it on this page what you want? (...) (point) or do we need to go in more descriptions	points to device screen	QYN QYN
292	NS	<u>IT'S ON THIS PAGE (.) MORE DESCRIPTIONS</u>	holds up a hand to represent each choice	QCH
293	AS		looks at hand representing more descriptions	RCH
294	NS	more descriptions (.) there you go then	accesses device and changes page	A R
295	AS		looks at book then device	

296	NS	having a good look round that page s		Co
297	NS	is it on there what you want?		QYN
298	AS	'no' (shakes head)		RN
299	NS	no (.) was that a no? (..) <u>IT'S ON THERE (.) IT'S NOT ON THERE</u>	holds up a hand to represent each choice	A C QCH
300	AS		looks at hand but has head in sideways position	RCH
301	NS	i can't see with your head like that darling (.) no (.) <u>IT'S ON THERE (.) IT'S NOT ON THERE</u>	holds up a hand to represent each choice	Ex A QCH
302	AS		looks at hand representing not on there	RCH
303	NS	it's not on there (.) do we need to go <u>BACK</u> ?	gestures back with hand	A QYN
304	AS	'yes' (nods slightly)		RY
305	NS	ok (..) so did you maybe need a different page?	accesses device and changes page	A QYN
306	AS	'yes' (nods)		RY
307	NS	yeh (..) shall we go back again (..) (point) so you've looked at that page and you've looked at that page (..) do you wanna look at the actions? (point)	accesses device and changes page points to symbols in turn points to device screen	A QYN Ex QYN
308	AS	'yes' (nods)		RY
309	NS	yes	accesses device and changes page	A
310	AS		accesses device and highlights symbol	
311	NS	ah		A
312	AS	'play'		In
313	NS	they're playing are they (..) and what's happened?		A QW
314	AS		struggles to access device	
315	NS	ok you're try are you trying to get to this one? (point) (.) S	points to device screen	A QYN AI
316	AS		looks at NS	RY
317	NS	are you trying to get to that one?		QYN
318	AS	'yes' (nods)	maintains eye contact	RY
319	NS	more actions there you go (*laughs) can you see what you want?	accesses device and changes page	A R QYN
320	AS	'through'		RY
321	NS	ah through what? (..) what did he		A

		go through? you're right he did go through didn't he		QW QW Co
322	NS	d'you know what he went through? (..) is it on this page?		QW QYN
323	AS	(shakes head ) (*VOCALISATION)		RN
324	NS	no (..) d'you wanna go back?		A QYN
325	AS		looks toward back button on device	RY
326	NS	d'you want some help to go back?		QYN
327	AS	'yes' (nods)	looks at NS	RY
328	NS	yes (..) is it on this page or have we got to go <u>BACK AGAIN</u> ?	accesses device and changes page gestures around page with finger	A QCH
329	NS	<u>IT'S ON THIS PAGE (..) WE NEED TO GO BACK AGAIN</u>	holds up a hand to represent each choice	QCH
330	AS		looks at hand representing go back again	RCH
331	NS	oh do we (..) ah where we going now then?	accesses device and changes page	A QW
332	NS	was it the we've come out of actions (point) (..) so was it in the objects or the descriptions (..) <u>OBJECTS (..) DESCRIPTIONS</u>	points to device screen holds up a hand to represent each choice	Ex QCH QCH
333	AS		looks at hand representing objects	RCH
334	NS	objects (..) is it on <u>HERE</u> ? or do we need to go into more?	accesses device and changes page gestures around page with hand	A QYN QYN
335	AS		attempts to select more on device	RY
336	NS	you're looking straight at it aren't you (..) want some help to get in there?		Co QYN
337	AS	'yes' (nods)	looks at NS	RY
338	NS	ah	accesses device and changes page	A
339	AS		looks at NS then device	
340	NS	are you gonna use your eyes or are you gonna use me?		QCH
341	AS		looks at NS	RCH
342	NS	you're gonna use me (*laughs) (..) ok you ready then (..) looking	gestures towards	A R

		at THE SCREEN	device	I
343	NS	is it in this row (point)	points to device screen	QYN
344	AS	'no' (shakes head slightly)		RN
345	NS	no can you try and move your head up so i can see clearly (..) is it in the NEXT ROW?	scans down with finger	A I QYN
346	AS	'yes' (nods)	looks at NS	RY
347	NS	yes (..) ok is it a mouse? (point)	points to device screen	A QYN
348	AS	'no' (shakes head)		RN
349	NS	is it the rabbit? (point)	moves finger to next symbol	QYN
350	AS	'no' (shakes head)		RN
351	NS	is it the rabbit?	moves to see more clearly	C
352	AS	'no' (shakes head)		RN
353	NS	no is it the fence? (point)	moves finger to next symbol	QYN
354	AS	'fence'		RY
355	NS	oh it is the fence (..) you got that yourself well done (..) he did play through the fence didn't he (..) up in the sky he goes (..) d'you wanna add anything else?		A Co Pr Co QYN
356	AS		looks at book	
357	NS	i think that's the last that this page that's the last page (..) did you want to add anything else or have you finished? (..) <u>WANNA ADD (..) YOU'VE FINISHED</u>	holds up a hand to represent each choice	Ex QCH QCH
358	AS		looks at hand representing want to add but is facing slightly away from NS	RCH
359	NS	i need to see S (..) <u>YOU WANNA ADD SOMETHING ELSE (..) YOU'VE FINISHED</u>	moves round front of AS holds up a hand to represent each choice	I QCH
360	AS		looks at hand representing want to add something	RCH
361	NS	[ok]		A
362	AS	<i>['play] through fence'</i>		In
363	NS	ok go on then		A I
364	AS		struggles to access device then looks at NS	RH
365	NS	are you looking at go back?		QYN



366	AS	'yes' (nods)		RY
367	NS	yeh (.) i thought you were (.) right there you go	accesses device and changes page	A Co R
368	AS		accesses device and highlights symbol	
369	NS	good girl		Pr
370	AS	'squirrel'		In
371	NS	the squirrel (...) he went through the fence (..) didn't he (.) he went through the fence and ended up where (point)	points to book	A Co QW
372	AS		struggles to access device then looks at NS	RH
373	NS	d'you want me to be your scanner?		QYN
374	AS	'yes'(nods)	maintains eye contact	RY
375	NS	ok (.) (point) is it in this row?	points to device screen	A QYN
376	AS	'no' (shakes head)		RN
377	NS	no (.) <u>IS IT IN THIS ROW?</u>	scans down with finger	A QYN
378	AS	'yes' (nods)	gives eye contact	RY
379	NS	yes		C
380	AS	'yes' (nods)	maintains eye contact	RY
381	NS	yes (.) is it (point) (.) you need to look at the screen (.) is it is it this one mummy squirrel	points to symbol	A I C
382	AS	'yes' (nods slightly)	looks at NS	RY
383	NS	was that a yes or a no?		QYN
384	AS	'yes' (nods)	maintains eye contact	RY
385	NS	a yes (.) [ <i>mummy squirrel</i> ] [mummy squirrel] yeh (.) anything else?	accesses device	A In A QYN
386	AS	'squirrel'	looks at NS	In
387	NS	yeh so squirrel and mummy squirrel (.) baby squirrel went <u>THROUGH</u> the fence didn't he (..) is that the end?	uses gesture to indicate 'through'	A S S QYN
388	AS		struggles to access device then looks at NS	
389	NS	<u>IT'S THE END (.) YOU WANNA ADD SOMETHING ELSE</u>	holds up a hand to represent each choice	QCH
390	AS		looks at hand	RCH

			representing want to add something	
391	NS	ok d'you want me to be your scanner		A QYN
392	AS	'yes' (nods)	looks at NS	RY
393	NS	yes (.) ok so is it in this row? (point) (..) i just need a yes or no S	points to device screen	A R QYN I
394	AS	'yes' (nods slightly)		RI
395	NS	is it is it in this FIRST ROW?(.) 'tree' oops that was me that wasn't (..) i'll rub that one out cos that was me i think not you (..) unless it was you i didn't notice (..) it don't want to rub out (..) ['squirrel!'] [right] (..) so is it in this top row? (point)	gestures along row with finger  accesses device accesses device  points to device screen	QYN Co Ex Co Co R QYN
396	AS	'yes' (nods)	gives eye contact	RY
397	NS	yeh (.) d'you wanna go into the more objects is that what you're telling me?		A QYN
398	AS	'yes' (nods)	maintains eye contact	RY
399	NS	yes?		C
400	AS	'yes' (nods)	maintains eye contact	RY
401	NS	right (..) there you go	accesses device and changes page	A R
402	AS		looks around device screen	
403	NS	is it there what you're looking for?		QYN
404	AS		looks at NS	RN
405	NS	is it there?		QYN
406	AS	'no' (shakes head)	maintains eye contact	RN
407	NS	no (..) d'you wanna go back?		A QYN
408	AS	'yes' (nods)	maintains eye contact	RY
409	NS	there you go then (..) is it there?	accesses device and changes page	A QYN
410	AS		highlights symbol	RY
411	NS	mmmm		A
412	AS		struggles to access device then looks at NS	RH
413	NS	want some help?		QYN
414	AS	'yes' (nods)	maintains eye contact	RY

415	NS	ok (.) (point) so is it in this row? (..) is it are you trying to get <u>THIS ONE?</u> (point)	points to device screen points to specific symbol on screen	A QYN QYN
416	AS	'yes' (nods)	gives eye contact	RY
417	NS	yeh (.) 'tree' tree (.) they did end up (.) (point) he ended up back in the tree didn't he (.) is that the end have you finished?	accesses device  points to page in book	A In A Co QYN
418	NS	<u>YOU'VE FINISHED (.) YOU WANNA ADD SOMETHING ELSE</u>	holds up a hand to represent each choice	QCH
419	AS		looks at hand representing finished	RCH
420	NS	you've <u>FINISHED</u> (.) good story d'you wanna go to speak and see what it says (.) see if you can get to speak or not	uses Makaton sign for 'finish'	A Pr QYN QCH
421	AS	(*vocalisation)	struggles to access device	RCH
422	NS	that'll be a no then will it (.) d'you wanna listen to it all back?		A QYN
423	AS	'yes' (nods slightly)		RY
424	NS	d'you want some help with that?		QYN
425	AS		drops head	
426	NS	this is hurting my neck (*laughs) (..) d'you want some help with that?	follows AS and lowers head	Co QYN
427	AS	'yes' (nods)	raises head	RY
428	NS	yeh (.) alright ready then you listening (.) 'play through fence squirrel mummy squirrel squirrel tree'	accesses device	A R I S
429	NS	they did go through the fence didn't they (.) it didn't say the whole story though did it don't know why (.) it only said what's actually there didn't it (point)	points to device screen	A Co Co
430	NS	listen again (.) 'play through fence squirrel mummy squirrel squirrel tree' (.) mmm so it just is repeated the last bit of the story that you did (.) well done s d'you like that story?	accesses device	I Co Ex Pr QYN
431	AS	'yes' (nods)	looks at NS	RY
432	NS	you do (.) it's quite funny isn't it		A Co

433	AS	'yes' (nods)	maintains eye contact	R Y
434	NS	yeh (.) good		A Pr

# Appendix C5

## Participant S – Linguistic Move-Type

Linguistic Move-Type	Session												
	1			2			3			4			
	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	
Ready	0	0	0	0	1	0	9	0	3	0	3	0	19
Instruct	0	20	0	4	4	0	13	0	20	0	19	0	29
Explain	0	32	0	6	27	0	48	0	22	0	31	0	24
Inform	9	3	1	1	4	1	3	1	0	4	3	7	10
Check	0	19	0	1	17	0	15	0	8	1	12	0	24
Align	0	0	0	0	1	0	0	0	0	0	0	0	1
Query-YN	0	105	0	9	59	0	63	0	15	0	33	0	103
Query-W	0	20	0	8	4	0	31	0	4	0	34	0	20
Query-Choice	0	13	0	0	8	0	17	0	7	0	7	0	30
Query-Completion	0	0	0	0	1	0	0	0	0	0	1	0	0
Request help	3	0	2	0	6	0	5	0	2	0	3	0	0
Acknowledge	1	75	0	17	1	58	1	82	6	32	12	75	118
Object	0	0	0	0	1	0	0	0	0	0	0	1	1
Reply-Y	67	0	3	0	39	0	40	0	10	0	23	0	65
Reply-N	24	0	1	0	15	0	8	0	6	0	8	0	19
Reply-W	6	0	5	0	0	0	12	0	1	0	23	0	4
Response to instruction	12	0	6	0	2	0	9	0	17	0	13	0	14
Reply-Choice	12	0	0	0	6	0	10	0	6	0	6	0	22
Reply-Completion	0	0	0	0	1	0	0	0	0	0	0	0	0
Clarify	0	0	0	0	0	0	0	0	0	0	0	0	0
Praise	0	20	0	10	0	12	0	36	0	17	0	31	28
Comment	2	40	0	6	0	22	0	44	2	7	1	37	49
Summarise	0	5	0	2	0	2	0	6	0	0	2	9	7
Repetition	0	0	0	0	0	0	0	0	0	0	0	0	0
Operation of device-Other	0	0	0	0	0	0	0	0	0	0	0	0	0
NPC	9	1	0	0	1	0	1	0	0	0	2	1	0
<b>Total Preparation Moves</b>	0	0	0	0	1	0	9	0	3	0	3	0	19
<b>Total Initiation Moves</b>	9	212	1	29	4	122	19	190	1	76	5	140	241
<b>Total Response Moves</b>	124	140	15	35	65	94	80	168	48	56	88	153	203
<b>Total Moves</b>	142	353	16	64	70	217	100	367	49	135	95	297	463

Frequency of Linguistic Move-Type use for each data collection session according to narrative type

## Appendix C6

### Participant S – Linguistic Complexity

	Session	Personal	Fictional
<b>Total Words (Tokens)</b>	1	21	8
	2	24	59
	3	3	40
	<b>Total</b>	<b>184</b>	<b>130</b>
<b>Different Words (Types)</b>	1	12	8
	2	12	19
	3	3	16
	<b>Total</b>	<b>27</b>	<b>43</b>
<b>TTR</b>	1	0.57	1.00
	2	0.50	0.32
	3	1.00	0.40
	<b>Total</b>	<b>0.56</b>	<b>0.40</b>

Frequency of word use and TTR for Participant S by narrative condition across all data collection sessions

	Session	Personal	Fictional
<b>Content Words</b>	1	18	8
	2	22	59
	3	3	40
	<b>Total</b>	<b>43</b>	<b>107</b>
<b>Function Words</b>	1	3	0
	2	2	0
	3	0	0
	<b>Total</b>	<b>5</b>	<b>0</b>

Frequency of content and function word use for Participant S by narrative condition across all data collection sessions

## Appendix C7

### Participant S – Communicative Modality

Communicative Modality	Session															
	1			2			3			4						
	Personal AS	Fictional AS	NS	Personal AS	Fictional AS	NS	Personal AS	Fictional AS	NS	Personal AS	Fictional AS	NS				
Speech	0	56	0	12	0	30	0	57	0	19	0	46	-	-	0	65
Vocal Gesture	15	6	0	2	6	0	2	2	0	0	0	2	1	-	4	4
Co-Action	0	0	0	0	0	0	0	0	2	2	0	0	0	-	10	7
AAC-Encoding	22	2	6	0	12	2	13	4	4	1	19	0	-	-	18	3
AAC-Output	1	0	0	0	1	0	3	1	0	0	3	0	-	-	1	3
Eye Gaze - Person	61	75	6	12	27	43	27	48	11	26	22	48	-	-	47	93
Eye Gaze - Device	64	50	26	19	55	41	93	94	28	19	82	74	-	-	139	107
Eye Gaze - Other	1	6	0	3	0	2	13	11	0	0	11	10	-	-	24	14
Facial & Body Gesture	17	19	1	0	6	4	5	10	1	4	6	1	-	-	19	7
Sign	0	1	0	1	0	2	0	0	0	0	0	3	-	-	0	2
Env. Reference	0	17	0	1	0	7	0	18	0	5	0	10	-	-	1	27
Neutral	0	2	0	0	0	0	6	0	2	0	9	0	-	-	0	6
NPC	0	0	0	0	0	0	2	0	2	0	0	1	-	-	14	0
<b>Total Coded Instances</b>	181	234	39	50	107	131	164	245	50	76	154	194	-	-	277	338
<b>Total Communicative Acts</b>	181	232	39	50	107	131	156	245	46	76	145	193	-	-	263	332

Frequency of Communicative Modality use for each data collection session according to narrative type

## Appendix C8.1

### Participant J: Session One Fictional Narrative - The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	the squirrel story (point) (.) {this one HERE} (point)	Points to title on book Points at button on AAC device screen	In Ex
2	NS	can J touch it?		QYN
3	NS	do this one J (point)	Points at AAC device screen	I
4	NS	that's it (point)	Whispered and points again to device screen	A
5	AS	'squirrel Story'		RI
6	NS	the squirrel story		A
7	NS	let's have [a look]	Opening book	I
8	AS	[sssssskurrel story]		Rep
9	NS	[let's go back to the first page]		I
10	NS	who can we see? LOOK  let's have a look at [the animals J] (point)	Places book in front of AS Points to device screen	QW,I,AI
11	AS	[(*unintelligible speech)]		Rep
12	AS	(*?can we see)		In
13	NS	(point) touch that one Animals	Points to device screen	I
14	AS	'animals'		RI
15	NS	so who have [we got here?] (point)	Points to book	QW
16	AS	[animals]		Rep
17	NS	who have we got here J?	Still pointing at book	QW
18	AS	animals (point)	Points to character on page of book	RW
19	NS	which one is she?		QW
20	AS	she		Rep
21	NS	(point) mmmummy squirrel	Points to screen	In
22	AS	'Mummy squirrel'		RW
23	NS	(point) and	Points to book	QC
24	AS	and baby		RC
25	NS	PRESS THIS (point)	Points to device screen	I
26	AS	'baby squirrel'		RI
27	NS	baby squirrel (..) let's have a look		A



		and see (.) [see if I can remember]		I
				Co
28	AS	animals		RI
29	NS	[where are they?] [ <i>where</i> ]		QW
30	NS	(point) where are mummy and baby squirrel?	Points to book	QW
31	AS	[mummy baby squirrel]		RW
32	NS	[by their] (point)	Points to device screen	QC
33	AS	house		RC
34	NS	house		A
35	AS	'house' house		RC
				Rep
36	NS	where is their house J?		QW
37	AS	house		Rep
38	NS	do you think their house is in the forest or the garden? (point)	Points to device screen	QCH
39	AS	tree	looks at NS	RW
40	NS	'yes' (nods head)	gives eye contact to AS	A
41	AS	'forest'		RCH
42	NS	in the [forest]		A
43	AS	[forest]		Rep
44	NS	let's go back and see what happens (.) oh look J where are we here?		I,AI,QW
45	AS	flower		RW
46	NS	'where' there are some flowers aren't there		Co
47	AS	['flowers'] [flowers]		RY
				Rep
48	NS	and they live where do they live? in the (.) (point)	Points to device screen	QW,QC
49	AS	(*unintelligible speech)		NPC
50	NS	d'you think they live in the tree? (point)	Points to book	QYN
51	AS	[(*unintelligible speech)]		RY
52	NS	[yes (.) ok lets] turn the page then J		A
				I
53	AS		Looks at NS	
54	NS	d'you want to turn the page?		QYN
55	AS		Looks at NS	
56	NS	see what happens next		Ex
57			Both turn page	
58	NS	ooh look oops who [ <i>books</i> ] [have we] got here?		Co
				QW
59	NS	go back to our [squirrel story] [ <i>squirrel story</i> ]		Co
60	NS	which other animals have we got j? (point)	Points at book	QW
61	AS	Animals baby squirrel	turns page	Rep
				RW

62	NS	PRESS THIS (point)	Points at device screen	I
63	AS	'animals'	Turns page back	RI
64	NS	(point) which animals are on this page?	Points at book	QW
65	AS	animals		Rep
66	NS	which other ones J can you tell me?		QW
67	AS	animals (.) 'squirrel story animals' (.) the animals		Rep RW
68	NS	who's this? (point)	Points at character in book	QW
69	AS	this rabbit		RW
70	NS	{yes PRESS THIS} (point)	Points to device screen	A I
71	AS	'rabbit'		RI
72	NS	and what about this one (point)	Points at character in book	QW
73	AS	rat		RW
74	NS	where's the rat?		QW
75	AS	'rat'		RW
76	NS	good boy		Pr
77	AS	ooh rat		Rep
78	NS	J what are they doing here? (point)	Points at book	QW
79	NS	let's see if we can go back	accesses device	Ex
80	AS	(*unintelligible speech)		
81	NS	'what doing' (.) what are the animals doing?		QW
82	AS	'flew'		RW
83	NS	did they fly away?		QYN
84	AS	fly		Rep
85	NS	let's [have] [Live] oops (.) let's have a look J		Co I
86	NS	'what does it look like?' (.) what did I put the apples in APPLES can't remember	Mouthes the word Apples	Co Ex
87	AS	apples	whispered	Rep
88	NS	feelings (.) hmmm ok (.) well J what do you think that the [squirrel is]		Co QW
89	AS	[squirrel]		Rep
90	NS	[feeling?] ['feelings']		
91	NS	do you think the [squirrel is]		QYN
92	AS	[squirrel]		Rep
93	NS	a little bit hungry?		
94	AS	hungry		Rep
95	NS	d'you think [he's hungry?] (point)	Points at screen	QYN
96	AS	[hungry squirrel]		RY
97	NS	d'you think he's thinking about those apples?		QYN

98	AS	'hungry' (.) [hungry]		Ry Rep
99	NS	mmm	Turns page	A
100	NS	turn the page and see what happens (point)	Points at book	I
101	AS	apples squirrel (point)	Points at book	In
102	NS	the squirrel is eating the apples isn't he?	Still pointing at book	Co C
103	NS	'what doing?' (.) let's have a look		I
104	AS	rat		In
105	NS	can J find the rat on here? (point)	Points to device screen	QYN
106	AS	yes rat		Ry
107	AS	'animals rat' (.) rat		Ry Rep
108	NS	very good (.) the [squirrel]		Pr In
109	AS	[/s/ (point)]	Points at device	
110	NS	and what about the (.)		QC
111	AS	rabbit		RC
112	NS	mmm d'you want to [turn the page]		QYN
113	AS	['rabbit] rabbit'		RC
114	NS	mmm who else has come along		A QW
115	AS	badger		RW
116	NS	badger (.) can you [find that one on here] J? (point)	Points to device screen	A I
117	AS	[apple] (point)	Pointss to book	In
118	AS	'badger'		RI
119	NS	very good		Pr
120	AS	badger [apple]		Rep
121	NS	(point) [do you think] the badger wants the apple?	Points at book	QYN
122	NS	what are they doing J? (point)	Points at book	QW
123	AS	bush		RW
124	NS	[what are] ['what doing?'] they doing? (point)	Points at book	QW
125	AS	do rabbit (point)	Points at book	RW
126	NS	what is the rabbit doing? PUSHING	Mimics pushing and gives eye contact	QW
127	AS	rabbit (point)	Points at device screen then book	RW
128	NS	you need to go you find the rabbit [then] (point)	Points at device screen	I
129	AS	['animals] rabbit [rabbit']		RI
130	NS	[good] (.) what else? (point)	Points at book	Pr QW
131	AS	mm rat (point)	Points at book	RW
132	AS	'rat'		Rep

133	NS	what about this one?	moves book over on table	QW
134	AS	(points) Rabbit	Points at book and then looks at NS	RW
135	NS	'yes' (nods) mmhmm	gives eye contact to AS	A
136	AS	' <i>rabbit</i> '		RW
137	NS	and the (point)	Points at book	QC
138	AS	rabbit	Looks at NS	RC
139	NS	'yes' (nods) mmhmm	Gives eye contact to AS	A
140	AS	' <i>rabbit</i> '		RC
141	NS	d'you want to turn the page?		QYN
142	AS	(point) rat	Points at book and then looks at NS	In
143	NS	'yes'(nods)	Gives eye contact to AS	A
144	AS	' <i>rat</i> ' (.) rat		In Rep
145	NS	good boy		Pr
146	NS	what happens next J?		QW
147	AS	(point) oooh	Points at book	RW
148	NS	what's he doing?		QW
149	AS	{BABY baby squirrel}	Uses Makaton sign for 'baby'	RW
150	NS	baby squirrel	accesses AAC device	A
151	AS	' <i>baby squirrel</i> '		RW
152	NS	{WHAT what} is he doing?	Uses Makaton sign for 'what'	QW
153	AS	baby squirrel		Rep
154	NS	what is he do[ing?] [ <i>'what doing?'</i> ]		QW
155	NS	what is he doing there? (point)	Points at book	QW
156	AS	baby squirrel		Rep
157	NS	is he		
158	AS	Mummy squirrel baby squirrel (point)	Points at book	In
159	NS	go on then J find it on your talker (point)	Points to device screen	I
160	NS	it's down there (point)	Points to device screen	Ex
161	AS	' <i>animals</i> ' (.) oops (.) ' <i>squirrel Mummy squirrel Mummy squirrel</i> ' (.) oops		RI,Co
162	NS	and (point)	Points to book	QC
163	AS	baby squirrel (.) ' <i>baby squirrel</i> ' (.) {baby (.) baby BABY}	Uses Makaton sign for 'baby'	RC Rep
164	AS	badger (.) ' <i>badger</i> '		RW
165	NS	(*unintelligible speech)		A
166	NS	anything else on that page?		QYN
167	AS	yes		RY
168	NS	uh the story has finished		In

169	AS	story finished		Rep
170	NS	good boy J (.) le'ts clear our messages		Pr I

## Appendix C8.2

### Participant J: Session One Personal Narrative - A Birthday

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	J can you tell me about one of your birthdays? (point)	points to picture	QYN
2	AS	birthdays		Rep
3	NS	to do it on here J (point)	points to device	I
4	AS		looks to device and accesses something nudges NS for assistance	RI
5	NS	J's turn		Ex
6	AS		accesses new page on device leans forward and smiles	
7	NS	<u>WHO</u> /who is that?	uses Makaton sign for 'who'	QW
8	NS	[J/J's <u>FRIEND</u> /friends]	uses Makaton sign for 'J' and 'friend'	QC
9	AS	[friends]		RC
10	NS	good Boy		Pr
11	NS	[ <u>WHO</u> /who is there?]	uses Makaton sign for 'who'	QW
12	AS	friend's name (point)	looks to NS and points at device screen	RW C
13	NS	'yes' (nods)	gives eye contact	RY
14	AS	'friend's name, friend's name' (.) go	looks at screen and frowns	RW
15	AS	THIS ONE? (point)	looks to NS and points at device screen	C
16	NS	'yes' (nods)	gives eye contact	RY
17	AS	'friend's name' (.) oops		RW,Co
18	AS	THIS ONE? (point)	looks to NS and points at device screen	C
19	NS	'yes' (nods)	gives eye contact	RY
20	AS	'friend's name'		RW
21	AS	THIS ONE? (point)	looks to NS and points at device screen	C
22	NS	'yes' (nods)	gives eye contact	RY
23	AS	'friend's name'		RW

24	AS	THIS ONE? (point)	looks to NS and points at device screen	C
25	NS	'yes' (nods)	gives eye contact	RY
26	AS	'friend's name'		RW
27	AS	THIS ONE? (point)	looks to NS and points at device screen	C
28	NS	'yes' (nods)	gives eye contact	RY
29	AS	'friend's name'		RW
30	AS	THIS ONE? (point)	looks to NS and points at device screen	C
31	NS	'yes' (nods)	gives eye contact	RY
32	AS	'friend's name'		RW
33	AS	THIS ONE? (point)	looks to NS and points at device screen	C
34	NS	'yes' (nods)	gives eye contact	RY
35	AS	'friend's name'		RW
36	NS	J/J's FRIEND/friends	uses Makaton sign for 'J' and 'friend'	In
37	AS	friends	claps hands together (?attempt at manual sign for friends)	Rep
38	NS		accesses device	
39	AS	Birthday		In
40	NS	at your (...) birthday		A
41	AS	(*unintelligible speech)	grabs NS hand	
42	AS	Birthday THIS ONE? (point)	looks to NS and points at device screen	In,C
43	NS	'yes' (nods) go on then	gives eye contact	RY I
44	AS	'balloons'		RI
45	NS	does J have balloons [at his birthday?]		QYN
46	AS	[baaaaallooons] [birthday]		RY Rep
47	NS	[Like in] your picture (point)	points to picture	Ex
48	AS	Birthday		Rep
49	NS	what else does J have at his birthday?		QW
50	AS	Birthday cake THIS ONE? (point)	looks to NS and points at device screen	RW C
51	NS	'yes' (nods)	gives eye contact	RY
52	AS	'Birthday cake'		
53	NS	mmmm		A
54	AS	THIS ONE? (point)	looks to NS and points at device screen	C

55	NS	'yes' (nods)	gives eye contact	RY
56	AS	'present'		RW
57	NS	mmm J like opening his presents (.) what presents does J get for his birthday?		A QYN QW
58	AS	THIS ONE? (point)	looks to NS and points at device screen	C
59	NS	'yes' (nods)	gives eye contact	RY
60	AS	'candle' (.) candle		RW Rep
61	NS	is there a picture of a birthday cake?	looks at pictures on table	QYN
62	NS	J like the picture (point)	points to picture on the table then device	QYN
63	AS	[Birthday cake]		Rep
64	NS	[J had birthday cake] and candles (point)	points to corresponding pictures on device	S
65	AS	candles		Rep
66	NS	anything else?		QYN
67	NS	[what else does J LIKE to DO at his birthday?]	uses Makaton signs for 'like and 'do' and looks for eye contact	QW
68	NS	J shall we go back to the page	accesses device	I
69	AS	yes		RY
70	NS	what about this one? (point)	points at device screen	QW
71	NS	<u>WAITING</u>	uses Makaton sign for 'waiting'	I
72	NS	who else would be [at J's]		QW
73	AS	[waiting]		Rep
74	NS	Birthday		
75	AS	THIS ONE? (point)	looks to NS and points at device screen	C
76	NS	'yes' (nods)	gives eye contact	RY
77	AS	'Granny'		RW
78	NS	Yep (Accesses device)		A
79	AS	THIS ONE? (point)	looks to NS and points at device screen	C
80	NS	'yes' (nods)	gives eye contact	RY
81	AS	'Grandad'		RW
82	NS	anybody else?	accesses device	QYN
83	AS	anybody else?		Rep
84	AS	THIS ONE? (point)	looks to NS and points at device screen	C
85	NS	'yes' (nods)	gives eye contact	RY
86	AS	'Mother'		RW
87	NS	Mummy	accesses device	A



88	AS	THIS ONE? (point)	looks to NS and points at device screen	C
89	NS	errr not that one I don't think J (point)	points to device	RN
90	NS	(point) what about the who's this?	points to button on device screen	QW
91	AS	THIS ONE? (point)	looks to NS and points at device screen	C
92	NS	'yes' (nods)	gives eye contact	RY
93	AS	'sister's name, sister's name'		RW
94	NS	and (point)	points to device screen	QC
95	AS	THIS ONE? (point)	looks to NS and points at device screen	C
96	NS		smiles (.) stops J accessing device again	
97	NS	it's a bit slow that one it has to <u>WAITING</u> /wait	uses Makaton sign for 'waiting'	Ex
98	AS	'Daddy' (.) Daddy		RC Rep
99	NS	does <u>FATHER</u> /Daddy <u>COME</u> to J's birthday	uses Makaton signs for 'Father' and 'come'	QYN
100	AS	to my birthday		RY
101	NS	yes	accesses device	A
102	NS	J do you want to tell me anything else about your birthday or have you <u>FINISH</u> /finished	uses Makaton sign for 'finish' and looks for eye contact	AI,QCH
103	NS	Has J <u>FINISH</u> /finished?	uses Makaton sign for 'finish' and looks for eye contact	QYN
104	NS	<u>YES?</u>	uses Makaton sign for 'yes' and looks for eye contact	C
105	AS	yes	gives eye contact smiles	RY
106	NS	is J <u>HAPPY</u> to think about his birthday?	uses Makaton sign for 'happy'	QYN
107	AS	Birthday goodbye		RY
108	NS	J have you <u>FINISH</u> /finished telling me about your birthday?	uses Makaton sign for 'finish'	QYN
109	AS	finished birthday cake <u>GOODBYE</u>	smiles, gives eye contact to NS and waves at device	RY
110	NS	goodbye finished	looks at AS and nods	A
111	AS	<u>FINISH</u> /finished	uses Makaton sign for 'finish'	Rep
112	NS	good boy		Pr

## Appendix C8.3

### Participant J: Session Two Fictional Narrative - The Bus Story

	<b>NS/AS</b>	<b>Interaction</b>	<b>Comment/Non-verbal communication</b>	<b>Linguistic Move-Type</b>
1	NS	and there should be a story about a <u>BUS</u>	uses Makaton sign for 'bus'	Ex
2	NS	can you <u>SEE</u> it?	uses Makaton sign for 'see'	QYN
3	NS	[good boy]		Pr
4	AS		[accesses device]	RY
5	NS	right J lets have a look at the pictures again	takes book and places in front of AS	R I
6	AS	'bus' (.)		In
7	NS	[bus]		A
8	AS	[bus]		Rep
9	NS	who's in the bus? (point)	points to book	QW
10	AS	a bus		RW
11	NS	is there a bus driver(point) [on there?]	points to book	QYN
12	AS	[driver] bus		Rep
13	NS	it's a picture of a lady (point)	points to device	Ex
14	AS	'bus driver'		RY
15	NS	bus [driver]	whispered	A
16	AS	[driver]		Rep
17	NS	uuuuuuh what has the bus done?	NS takes audible exaggerated breath in	QW
18	AS	bus done		Rep
19	NS	the bus has run away		In
20	NS	let's have a look at that one (point)	points to device	I
21	NS	what does [that do?]		QW
22	AS	[finds']		RW
23	NS	he has (.) uhh (point)	points to button on device screen	QC
24	AS	'disappear'		RC
25	NS	disappeared oh dear		A
26	NS	is it a naughty bus?		QYN
27	AS	bus		Rep
28	NS	if you press that one J you can go back to your other page (point)	points to device screen twice	Ex
29	NS	press that one J (point)	points to button	I

			on device screen	
30	AS		accesses device	RI
31	NS	oops oh dear		Co
32	AS		accesses device	
33	NS	'books'	accesses device	
34	NS	there it is again	whispered	Co
35	NS	uuh the bus driver		In
36	AS	bus driver		Rep
37	NS	is running (.) let's [turn that J]	NS turns page whispered, almost inaudible	In,I
38	AS	[train] 'train'		In
39	NS	that's right	whispered	A
40	AS	'bus' (.) bus		In Rep
41	NS	good boy (.) train and bus		Pr,A
42	NS	(point) if you look at that one J it might tell you what the what does the bus look like?	points at book	Ex,QW
43	AS	bus		Rep
44	AS	'red' (.) red bus		In
45	NS	right (.) and what about his face? (point)	whispered points at book	A QW
46	NS	Is he happy the bus? (point)	points at book	QYN
47	AS	happy? bus?		Rep
48	NS	I don't know J you tell me what do you think? Look at the pictures (point)	points to device screen	A I QW I
49	NS	which one is the bus? (.) (point)	points to book	QW
50	NS	which one is the buses [face?]		QW
51	AS	[uh crying]	looks to NS	RW
52	NS	'yes' (nods) go on then (point)	gives eye contact and points to device screen	A I
53	AS	'sad'		RI
54	NS	it's a sad bus (.) what about the [train?] (point)	points to book	A QW
55	AS	[sad] (.) bus (.) uuuh	looks surprised towards NS	Rep RW
56	NS		smiles & gives eye contact	A
57	AS	THIS ONE? (point)	looks to NS and points to device screen	C
58	NS	'yes' (nods)	gives eye contact	RY
59	AS	'surprised [surprised]'		RW
60	NS	[is the bus] (.) the train surprised		QYN
61	NS	(point) then [what]	points to book	QW
62	AS	[yes]		RY
63	NS	happens J?		

64	AS	train		RW
65	NS	HERE (point)	points to book	
66	NS	let's go back to this page and see what happen where does the train go? (point)	accesses device points to device screen	I,QW
67	AS	train go		Rep
68	NS	look J it's a bit tricky to see there (point) but that's a tunnel (point)	points to book points to device screen	I,Ex
69	AS	'tunnel' (.) tunnel (point)	points to book	RW
				Rep
70	NS	the train's gone through the tunnel		Co
71	NS	uhhh(point) what is the policeman [doing?]	points at book	QW
72	AS	[policeman]		Rep
73	NS	(point) look is it that [one?]	points to device screen	QYN
74	AS	['whistle']		RY
75	NS	is he blowing his WHISTLE?	gestures blowing a whistle	QYN
76	AS	blow		Rep
77	NS	d'you want to turn the page if we've finished that page		QYN
78	AS	red bus		In
79	NS	red bus (.) you can go in (point) that's the one that tells you the red [bus]	points to device screen	A
				Ex
80	AS	['red] bus'		In
81	NS	good [boy]		Pr
82	AS	[bus] (.) ooh noo		Rep
				In
83	NS	uuh what's he doing? (point)	points to book	QW
84	AS	bus		Rep
85	NS	if you go to that one J (point) the red bus is (.) is there jumping? (point)	points to device screen points to device screen	Ex,QYN
86	AS	'bus field'		In
87	NS	'yes' (nods) good boy	smiles	A,Pr
88	AS	uhh ['fence]		In
89	NS	[the bus is] jumped into the field		Co
90	AS	oh [no!]		Co
91	NS	[has he] gone [OVER]	gestures 'over'	QYN
92	AS	[ooh]		
93	NS	the fence (.)		
94	AS	'town town'		OD
95	NS	what about that? (point)	whispered, points at book	QW
96	AS	(point) cow 'cow cow'	points at book	RW
97	AS	(point) [moo]	points at book	In

98	NS	[he's gone past] the cow hasn't he d'you think the cow said moo when he saw the bus?		Co QYN
99	AS	ooh 'bus'		In
100	NS	oops (point)	points at device	Co
101	AS	'books'		
102	NS	(point) It's that one (.) what does it look like	points at button on device screen	Ex
103	AS	'red scared happy'		In
104	NS	(point) is the bus scared or is he happy (.) Look at his face there	points at book	QCH,I
105	AS	'books'		
106	NS	good boy		Pr
107	NS	(point) where's the bus now J?	points at book	QW
108	AS	(point) 'bus' (.) 'sad' (.) 'books bus sad'	points at book	In
109	AS	[bus (.) sad]		Rep
110	NS	[the bus is sad]		A
111	NS	where is the bus? (point)	points at device screen twice	QW
112	AS	'river'		RW
113	NS	is [he in]		C
114	AS	[ooh]		
115	NS	the river		
116	AS	'books bus sad river'		In
117	NS	oooh dear (.) who comes back? (point)	points at book	A QW
118	AS	ooh (point)	points at book	RW
119	NS	(point) there it's the picture [of the woman]	points at device screen	Ex
120	AS	['bus driver']		RW
121	NS	that's it		A
122	AS	bus		Rep
123	NS	bus driver comes back (.) poor red [bus] (point)	points at book	Co,Co
124	AS	[red] bus		Rep
125	AS	'books'		
126	NS	(nods) (.) that's [it J]	whispered	A
127	AS	['red'] (.) 'books bus sad river bus driver books red'		In
128	AS		looks at NS	
129	NS	(nods) Ok?	smiles, gives eye contact	C
130	AS	'big' oooh nooo		In Co
131	NS	is it a big [bus?]		QYN
132	AS	oooh		
133	NS	[huh]		
134	AS	[oh] no		Co
135	NS	ok has J <u>FINISH</u> /finished his story	uses Makaton	A

		(.) turn the page [is that]	sign for 'finish'	QYN I QYN
136	AS	[finished]		Rep
137	NS	the end?		
138	AS	end		Rep
139	NS	<u>YES?</u>	looks for eye contact and uses Makaton sign for 'yes'	C
140	AS	[yes]	gives eye contact	RY
141	NS	[J] <u>HAPPY</u> with his story?	uses Makaton sign for 'happy'	QYN
142	AS	happy [story]		Rep
143	NS	[J you told] that story brilliantly (.) you are a very <u>GOOD</u> story teller	looks for eye contact uses Makaton sign for 'good'	Pr,Pr

## Appendix C8.4

### Participant J: Session Two Personal Narrative - A Christmas

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	so J's going to tell me about his Christmas (point)	points to device screen	Ex
2	AS		accesses device	
3	NS	have a look in there J (point)	points to device screen	I
4	AS		accesses device	RI
5	NS	what does J going to tell me about his Christmas		QW
6	AS	'Christmas tree'		RW
7	AS	THIS ONE? (point)	looks to NS and points to device screen	C
8	NS	'yes' (nods)	gives eye contact	RY
9	AS	'present'		RW
10	NS	does J like Christmas presents?		QYN
11	AS	good, opened		RY In
12	NS	what else J (.) did you open your Christmas present did you say?		QW,QYN
13	AS	THIS ONE? (point)	looks to NS and points to device screen	C
14	NS	'yes' [(nods)] [you can touch] whatever you like [on it]	gives eye contact	RY Ex
15	AS	'feels happy'		In
16	NS	does J feel <u>HAPPY</u> at <u>CHRISTMAS</u> ?	uses Makaton signs for 'happy' and 'Christmas'	A C
17	AS	present		In
18	NS	yeh I'm just gonna take that out of there we forgot to take that out of there didn't we and then it's a little bit easier for J to use it on the table	Takes device out of case and puts it onto the table	Ex
19	AS	[table]		Rep
20	NS	[I'll put that] to one side	whispered	Ex
21	NS	'opens' oops 'open'		Co
22	NS	oops that was Miss C's fault I did that	whispered	Co Ex

23	NS	what else do you want to tell me about Christmas J?		QW
24	AS	<i>'Christmas tree present feels happy opens open'</i>		In
25	AS	[open oops]		Co
26	NS	[does J feel] happy at <u>CHRISTMAS</u> time?	uses Makaton sign for 'Christmas'	C
27	NS	<u>WHAT</u> else can you tell me about <u>CHRISTMAS</u> ?	uses Makaton sign for 'what' and 'Christmas'	QW
28	AS	(*?aassh?) THIS ONE? (point)	looks to NS and points to device screen	C
29	NS	'yes'(nods)	Gives eye contact to AS	RY
30	AS	'stocking'		RW
31	NS	ah	whispered	A
32	AS	stocking		Rep
33	NS	[Christmas stocking]	whispered	A
34	AS	<i>['Christmas tree present] feels happy opens open stocking'</i>		In
35	NS	is that good J?		C
36	NS	is there anything else you want to tell me about your Christmas story?		QYN
37	AS	ooh	looks to NS	RY
38	NS		gives eye contact	
39	AS	THIS ONE? (point)	looks to NS and points to device screen	C
40	NS	'yes'(nods)	Gives eye contact to AS	RY
41	AS	<i>'plays play play'</i>		In
42	AS	<i>'Christmas tree present feels happy opens open stocking plays play play'</i>		In
43	NS	what about this one (point)	whispered, points to device screen	QW
44	AS	'toys'		RW
45	NS	does J like to <u>PLAY</u> with his toys at [Christmas]	uses Makaton sign for 'play'	QYN
46	AS	<i>['Christmas tree] present feels happy opens open stocking plays play play toys'</i>		In
47	NS	is there anything else you want to tell me about Christmas J?		QYN
48	AS	mmhmm		RN
49	NS	have you <u>FINISH</u> /finished telling me about <u>CHRISTMAS</u> ?	uses Makaton sign for 'finish' and 'Christmas'	QYN
50	AS	<u>FINISH</u> /finished	gives eye contact, uses Makaton sign for 'finish'	RY



51	NS	'yes' (nods) good boy	gives eye contact	A,Pr
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## Appendix C8.5

### Participant J: Session Three Fictional Narrative - Peter and the Cat

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	I think it's on the next page J		I
2	AS		accesses device and changes to next page	RI
3	NS	Peter and the cat (point)	points to device screen	I
4	AS	<i>'Peter and the cat'</i>		RI
5	NS	right shall we have a look at the first page LOOK (.) J	Moves book in front of AS	R I AI
6	NS	(point) in here	points to specific button on device screen twice	I
7	AS	(point) parrot	points to different area of device screen	In
8	NS	if you yeh if you click on there (*unintelligible speech) <i>'people and animals'</i>		A I
9	NS	who is on this page J? (point)	points to book	QW
10	AS		moves hand to access device	
11	NS	I think look (.) who's that? (point)	points to specific button on device screen	I,QW
12	AS	parrot		RW
13	NS	press it and see (point)	points to button again	I
14	AS	<i>'Peter'</i>		RI
15	NS	[Peter]		A
16	AS	[Peter]		Rep
17	NS	Peter and what animals has he got? (point)	points to book	A QW
18	AS	parrot (.) <i>'parrot'</i> (..) <i>'dog'</i>		RW
19	NS	AND (point)	points to an animal on the page	I
20	AS	<i>'mouse'</i>		RI
21	AS	THIS ONE? (point)	looks to NS and points at device screen	C

22	NS	ermm yeh there is a turtle there you're right J (point)	points to character in book	RY,A
23	AS	'turtle'		RW
24	NS	and		QC
25	AS	THIS ONE? (point)	looks to NS and points at device screen	C
26	NS	yep the cat's not on that page is it but you can put the cat in because we know the cat's coming shall we turn the page J and see what happens next?		RY Ex QYN
27	AS	THIS ONE? (point)	looks to NS and points at device screen	C
28	NS	yeh (nods) another [dog there] was <u>TWO</u> dogs wasn't there	holds two fingers up on hand to gesture two	RY,Co
29	AS	['dog'] (.) dog		RW Rep
30	NS	ok turn the page then (.) see what happens next		A I I
31	AS		turns page	RI
32	NS	oooh J what happens? (point)	points to page	AI,QW
33	AS	HELP (point)	points to two of buttons on device screen	RH
34	NS	do you want to go back to the other page? (point)	points to one of the buttons AS pointed to	QYN
35	AS	yes	presses button	RY
36	NS	let's see [what happens] (point)	points to another button on device screen	I
37	AS	['what doing']		RI
38	NS	what's the cat doing? (point)	points to page	QW
39	AS	cat		Rep
40	NS	saying PRESS THIS (point)	points to button on device screen	QC
41	AS	meow (.) meow (.) 'what doing meow'	presses button	RC Rep
42	NS	where is she? (point)	points to page	QW
43	AS	uh stuck tree (point)	points to page	RW
44	NS	she's stuck up the tree (.) shall we find that look (point)	points to device screen	A I
45	NS	look that one J says [stuck]		I
46	AS	['stuck']		RI
47	NS	stuck up the tree (point) and Peter (.) What's Peter doing?	points to page	A QW
48	NS	Peter is LOOK	uses Makaton sign for 'look'	QC
49	AS	(*vocalisation)	tries to turn page	RN

50	NS	do you think Peter is looking J? (point)	points to device screen	QYN
51	AS		turns page	
52	NS	do you think Peter is looking at the cat? (point)	points to device screen	QYN
53	AS	'hear'		OD
54	NS	he can hear her saying meow		In
55	NS	what does Peter decide to do? (point)	points to page	QW
56	AS	'gardening'		OD
57	NS	(point) what does Peter decide to do?	still pointing at page	QW
58	AS	(point) stuck tree	points to page	In
59	NS	(point) What's look at the this page Pete erm J What's he doing now? He is CLIMBING	points to page NS mimes 'climbing'	I,QW,QC
60	AS	rabbit (.) [stuck]		In
61	NS	[climbing] I think he's climbing the tree there		In
62	AS	(*vocalisation) (.) oh dear (.) 'objects'	turns page	Co
63	NS	where are they? (point)	points to page	QW
64	AS	[ladder] ['ladder']		In
65	NS	are we on that page?		O
66	AS	no		RN
67	NS	I don't think the ladders arrived yet (.) where are they? they're up the (point)	points to page	A QW QC
68	AS		accesses device	
69	NS	good boy you can go back to yes we're on that page [ok] (point)	points to device	Pr Ex
70	AS	['books'] (.) 'Peter and the Cat'		A
71	NS	good boy	whispered	Pr
72	NS	J who's stuck up the tree now?		QW
73	AS	'what doing' (..) 'stuck'		RW
74	NS	good boy	whispered	Pr
75	AS	'objects' (..) 'bush bush' (..) ['tree']		RW
76	NS	[good] boy		Pr
77	AS	'stuck tree'		RW
78	NS	good boy [J]		Pr
79	AS	[stuck] tree		Rep
80	NS	see what happens next		I
81	AS		turns page	RI
82	AS	'books' (.) 'Peter and the Cat'		OD
83	NS	what happens now J?		QW
84	AS	'what doing' (.) 'meow meow stuck'		RW
85	NS	what does Peter say?		QW

86	AS	'book' (.) 'Peter and the Cat'		OD
87	NS	what does he say?		QW
88	AS	'what doing'		Rep
89	NS	what does he <u>SAY</u> ?	uses Makaton sign for 'say'	QW
90	AS	'meow stuck'		RW
91	NS	[can you see what that one is J?] (point)	points to device screen	I
92	AS	['meow stuck']		Rep
93	AS		presses button pointed to by NS	RI
		'objects' (..) 'tree'		
94	AS	'meow stuck tree'		RW
95	NS	good boy (.) but then what does he say? he says (point)	points to page	Pr QW QC
96	AS	help	whispered	RC
97	NS	help (.) shall we see if we can find that [one J] (point)	points to device screen	A I
98	AS	help		Rep
99	NS	see if you can find help		I
100	AS	'bush'		OD
101	NS	go back to the [other page]		I
102	AS	['bag']		OD
103	NS	his [bag's on] the floor isn't it		In
104	AS	['bag'] (..)	accesses device	OD
105	NS	oh that one didn't come up (.) (point) that one says hose	points to device screen	Co Ex
106	AS	'garden' (.)	accesses device	OD
107	NS	hose (.) that one's not working is it		A Ex
108	NS	go to the other page and see if you can find help (point)	points to device screen	I
109	AS	'what [doing']		RI
110	NS	[and then] go from there		I
111	NS	he says help (point)	points to specific button on device screen	I
112	AS	'help'		RI
113	NS	who says help? (point)	points to device screen	QW
114	AS	'what doing' (..) 'stuck' (.) 'objects' (.) 'tree'		RW
115	NS	stuck in a tree and he says		A QC
116	AS	'help stuck tree'		RC
117	NS	good boy (.) and who comes to help? (point)	points to page	Pr QW
118	AS	Mummy		RW

119	NS	(point) It's not Mummy it's a <u>MAN</u>	points to page, uses Makaton sign for 'man'	O In
120	AS	Daddy		RW
121	NS	ma (.) I think it's a man (point)	points to device screen	In
122	NS	If you go back to the people page (point)	points to device screen	I
123	AS	<i>['people and animals']</i>		RI
124	NS	[you might] you might find a man		Ex
125	NS	is there a <u>MAN</u> ? (.) (point) this one here look	uses Makaton sign for 'man', points to device screen	QYN,I
126	AS	'man'		RI
127	NS	he comes to <u>HELP</u> what's the [man doing] (point)	uses Makaton sign for 'help', points to page	S QW
128	AS	[help]		Rep
129	NS	what's the man doing (point)	points to page	QW
130	AS	man doing		Rep
131	NS	let's have a look here look (.) what's he doing?	accesses device and changes page	I,QW
132	AS	'what doing'		RI
133	NS	he is	looks at device	QC
134	AS	stuck		RC
135	NS	I think he's gardening (point)	points to device screen	O
136	AS	[stuck]		Rep
137	NS	[shall we] turn the page J you're doing ever so well		I Pr
138	NS	and what does the man do to help? (point)	points to page	QW
139	AS	(*unintelligible speech)		NPC
140	NS	what does he get		QW
141	AS	'meow' (..) <i>'people and animals'</i>		OD
142	NS	so the man (point)	points to device screen	QC,I
143	AS	'cat' (.) <i>'what doing'</i>		OD
144	NS	that one (point)	whispered, points to device screen	I
145	AS	<i>'objects'</i>		RI
146	NS	PRESS THIS (point)	points to device screen	I
147	AS	<i>'ladder'</i>		RI
148	NS	good boy		Pr
149	AS	<i>'stuck people and animals' (.) 'cat' (.) 'what doing' (.) 'stuck' (.) 'objects' (.) 'ladder'</i>		In
150	NS	good [boy]		Pr
151	AS	<i>['tree']</i>		In
152	NS	[what does]		

153	AS	<i>['cat stuck] ladder tree'</i>		In
154	NS	good boy he goes down the ladder doesn't he J	turns page	Pr,A
155	NS	what does he say to the man? (point)	points at page	QW
156	AS	man		Rep
157	NS	what does he say he says (..) THANK [YOU]	uses Makaton sign for 'thank you'	QC,In
158	AS	[THANK] YOU (..) (*vocalisation)	uses Makaton sign for 'thank you', turns page	Rep
159	NS	and what happens at the end?		QW
160	AS	(*vocalisation)		
161	NS	who's this shall we find this (point)	points to page	QW,I
162	AS	Mummy		RW
163	NS	Mummy shall we see if we can find Mummy I think Mummy is in there (point)	points to device screen	A I Ex
164	AS	<i>'feelings'</i>		OD
165	NS	how do you think Peter is [feeling?]		QW
166	AS	<i>['surprised']</i> (.) <i>'worried'</i> (.) <i>'scared'</i> (.) <i>'shocked'</i>		OD
167	NS	which one are you going to choose for Peter J?		QCH
168	AS	<i>'phrases'</i> (.) <i>'help'</i> (.) <i>'thank you'</i>		OD
169	NS	that's what he said to the man at the end [isn't it]		In
170	AS	<i>['books']</i> (.) <i>'Peter and the Cat'</i>		OD
171	NS	what does he say?		QW
172	AS	<i>'look'</i> (.) <i>'blue'</i> (.) <i>'red'</i> (.) <i>'yellow'</i> (.) <i>['orange']</i>		OD
173	NS	[J] have you finished telling me the story?		AI,QYN
174	AS	yes		RY
175	NS	yes (.) good boy (.) shall we say [the end]		A,Pr,Co
176	AS	<i>['Peter and the] cat'</i> (.) <i>'feelings'</i> (.) <i>'scared'</i>		OD
177	NS	was Peter scared when he was up the tree J?		QYN
178	AS	<i>'what doing'</i> (.) <i>'meow'</i> (..) <i>'what doing'</i> (*vocalisation) (.) meow meow		OD,Rep
179	NS	meow (.) has J <u>FINISH</u> /finished the story?	uses Makaton sign for 'finish'	A QYN
180	AS	<u>FINISH</u> /finished [story]	uses Makaton sign for 'finish'	RY
181	NS	[good boy] J that was brilliant telling me the story good boy		Pr,Pr

## Appendix C8.6

### Participant J: Session Three Personal Narrative - Pets

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	is there one called Pets on there?		QYN
2	AS	pets		RY
3	NS	J tell me about his pets (.) what's J got?		AI I
4	AS	'rabbit' (.) 'mouse' (..) 'rabbit' 'mouse' (..) 'rabbit' (.) 'rabbit' (..) 'rabbit rabbit'		OD
5	NS	which pets has J got at home?		QW
6	AS	'guinea pig' (..) 'fish' (..) 'hamster' (..) 'hamster' (..) 'dog' (..) 'cat' (..) (*?No)		OD
7	NS	which pets have you got J?		QW AI
8	AS		accesses Device and goes to page with different stories on	
9	NS	that's it go onto that (point)	points to device screen	I
10	AS	no		RI
11	NS	you don't want to tell [me about your pets]		C
12	AS	['pets']		OD
13	NS	look J see what that one says (point)	points to device screen	I
14	AS		accesses device	RI
15	NS	I like		In
16	AS	likes		RI
17	NS	which pets would you [like J?]		QW
18	AS	['want'] (.) ['don't like']		OD
19	NS	[which would you WANT?]	uses Makaton sign for 'want'	QW
20	AS	'likes want don't like' (.) don't		OD Rep
21	NS	which pets does J not like?	accesses device and changes page	QW
22	NS	I <u>DON'T</u> like (points)	uses Makaton sign for 'don't/no', points to device screen	In
23	AS	'sister' (..) 'eat' (.) 'eat' (..) 'drink'		OD



24	NS	you can tell me what your pets eat and drink J		Ex
25	AS	'drink' (..) 'drink' (.) ['eat' (.) 'drink']		OD
26	NS	[J I think you've got a snake at home] haven't you		AI In
27	AS	'stroke'		OD
28	NS	I don't think there's a snake on here but I know you've got one at home		Ex
29	AS	'see'		OD
30	NS	J do you look [after your] (point)	points to device screen	AI I
31	AS	[look after]		RI
32	NS	and cos you've got a <u>DOG</u> [at home as well] haven't you	uses Makaton sign for 'dog'	In C
33	AS	[no]		RN
34	AS	'sad' (.) 'excited' (.) 'happy' (.) 'sad excited happy' (..) oooh (*?sad)		OD Co
35	NS	what about this one J can you tell me something about that in there? (point)	points to device screen	QW I
36	AS	'tank'		RI
37	NS	is that where your snake lives in a tank like that? (point)	points to specific button on device screen	QYN
38	AS	'tank' (..) 'lead' (.) 'hutch' (.) ['cage']		OD
39	NS	[J what has your] dog got? (.) has dog got a collar and a [lead?] (point)	points to device screen	AI QW QYN
40	AS	['cage'] (.) 'toys' (.) 'pet food' (.) 'tank' (.) 'toys' (.) 'tank' (..) 'toys tank'	looks at NS	OD
41	NS	'yes' (nods) is that what your snake has got (.) toys [and a tank]	meets eye contact from AS	A C
42	AS	['collar'] (..) 'collar'		OD
43	NS	shall we see if we can find a picture of your dog?		QYN
44	AS	snake	looks at NS and takes her hand	In
45	NS	(nods) <u>YEP</u> so your snake lives in a (..) tank (.) yes?	moves hand towards device	A C
46	AS	yes		RY
47	AS	'quiet'		OD
48	NS	what colour is your dog? (point)	points to device screen and indicates colour choices	QW
49	AS	'quiet'		OD
50	NS	is he brown or black or [grey] (point)	points to specific button for each	QCH

			colour in turn	
51	AS	<i>['quiet']</i> (.) (*?grey) (..) 'grey' (.) 'brown'		OD
52	NS	I think he's black		Co
53	AS	'gold' (.) 'white' (.) 'funny' (.) 'furry' (.) (*vocalisation)	looks at NS	OD
54	AS	'loud big small'		OD
55	NS	WHICH one is your dog? (..) J shall we find a picture of your dog?	uses Makaton sign for 'which'	QCH AI QYN
56	AS	no		RN
57	NS	you don't want to show me a picture		A
58	AS	'hamster [hamster]'		OD
59	NS	[would J] like a hamster?		QW
60	AS	hamster		RW
61	NS	which pet would J like to have?		QW
62	AS	'pets' (...) 'collar' (.) 'cage' (.) 'house' (.) 'lead' (.) 'toys' (.) 'pet food' (.) 'tank tank' (.) 'collar [collar]'		OD
63	NS	[J do you] want to tell me anything else about your pets?		QYN
64	AS	'rabbit rabbit' (..) 'pets'		OD
65	NS	who WALK/s your dog J?	uses Makaton sign for 'walk'	QW
66	AS	'rabbit'		OD
67	NS	is it Daddy or is [it Mummy?]		QCH
68	AS	<i>['rabbit']</i> (.) 'rabbit'	sits back away from device	OD
69	NS	have you FINISH/finished J?	uses Makaton sign for 'finish'	QYN
70	AS	FINISH/finished	uses Makaton sign for 'finish'	RY
71	NS	FINISH/finished telling me about your pets	uses Makaton sign for 'finish'	C
72	AS	pets		Rep
73	NS	YES?	uses Makaton sign for 'yes'	C
74	AS	yes		RY
75	NS	good boy (.) you've worked really hard well done		Pr Pr

## Appendix C8.7

### Participant J: Session Four Fictional Narrative – The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	we are looking for the squirrel story I can see it on that page (point)	points to device screen	Ex
2	NS	where's the squirrel story (.) it's right at the top (point)	points to device screen	QW Ex
3	NS	books (.) there it is (point)	points to device screen	Ex
4	AS	'squirrel story'		RW
5	NS	right let's open up the page and see who's on the first page of the squirrel story and J's going to tell me [the story] (point)	opens book points to first page	R I I
6	AS	[mummy] [squirrel]		RI
7	NS	[right lets] have a look at the characters then (point) (.) J look in that one	points to device screen	I I
8	AS	'animals'		RI
9	NS	who's in the		
10	AS	animals		Rep
11	NS	who's on that page?		QW
12	AS	'squirrel'		RW
13	NS	and		QC
14	AS	mum		RC
15	NS	try that one (point)	points to device screen	I
16	AS	'mummy squirrel'		RI
17	NS	mummy squirrel (.) <u>WHERE</u> are they?	uses Makaton sign for 'where'	A QW
18	AS	mummy (point)	points to picture	Rep
19	NS	where (.) <u>WHERE</u> are they?	uses Makaton sign for 'where'	QW
20	AS	THIS ONE? (point)	points to device screen and looks at NS	C
21	NS	<u>YEH</u> (nods)		RY
22	AS	baby		RW
23	NS	mu mummy squirrel and baby squirrel (.) I don't think		A

24	AS	'squirrel'		RW
25	NS	oh that one say Baby squirrel J (point)	points to device screen	Ex
26	AS	'baby squirrel'		A
27	NS	that's right (..) If you go back to here we might be able to (point)	points to device screen	A I
28	AS		accesses device	RI
29	NS	where are they?		QW
30	AS	'where'		Rep
31	NS	<u>WHERE</u> are they in this picture? (point)	uses Makaton sign for 'where', points to picture	QW
32	AS	where house 'house'		Rep RW
33	NS	(nods) <u>YEH</u> (.) house is in the (point)	points to device screen then page of book	A QC
34	AS	tree		RC
35	NS	mm (point)	points to device screen	I
36	AS	'tree'		RI
37	NS	alright what happens then J? (point) (..) what happens?	points to page	R QW QW
38	AS	(*vocalisation) tree		Rep
39	NS	mummy says yeh you can go and play I think		In
40	AS	rabbit (point)	turns page points to page	In
41	NS	let's do it on our talker J (point)	points to device screen	I
42	AS	'ball' ball		RI Rep
43	NS	that's right (.) who is playing ball (point) [who?] (point)	points to device screen points to device screen	A QW
44	AS	[ball] (.) 'animals' (..) 'rabbit' [rabbit] (point)	points to page	Rep RW
45	NS	[right] who else?		A QW
46	AS	rabbit		Rep
47	NS	who else? (point)	points to page	QW
48	AS	a mouse 'rat'		RW
49	NS	I think that one says rat and that one says mouse (point) <u>WHICH</u> one do you think?	points to two options on device screen uses Makaton sign for 'which'	Ex QW
50	AS	'worm'		OD
51	NS	is there a worm there? (.) [no]		O
52	AS	['mouse']		RW
53	NS	and squirrel		In

54	AS	squirrel (.) 'mummy squirrel'		Rep RW
55	NS	Oh not mummy squirrel NO I think it's baby squirrel [isn't it] (point)	uses Makaton sign for 'no', points to page	O Ex
56	AS	['squirrel']		A
57	NS	are <u>PLAY</u> /ing ball	uses Makaton sign for 'play'	In
58	AS	playing ball (.) [squirrel ball]		Rep In
59	NS	[then what] happens J?		QW
60	AS	apple (point)	points to page	RW
61	NS	oh lets go back and see (point)	accesses device and changes page then points at device screen	Co
62	AS	'where' (.) 'apples' apples		RW
63	NS	are in (.) I think it's the <u>GARDEN</u> isn't it	uses gesture for 'ground/garden'	QC Ex
64	AS	LOOK squirrel (*unintelligible speech) apple rabbit mouse garden (.) squirrel	takes NS hands and guides round the page while speaking	In
65	NS	good Boy (.) they want to eat that apple don't they		Pr In
66	AS	oooh	turns page	Co
67	NS	oh J what are they doing? (point) look at that one	accesses device changing page then points to device screen	A QW I
68	AS	'what doing'		RI
69	NS	what are they doing they are <u>EAT</u> /(*makes eating sound effect)	uses Makaton sign for 'eat' and makes sound effect	QC
70	AS	' <u>EAT</u> /ing'	uses Makaton sign for 'eat'	RC
71	NS	LOOK (point)	points to device screen	I
72	AS	eat (.) 'eats' (.) [eat]		RI
73	NS	[WHAT] are they eating?	uses Makaton sign for 'what'	QW
74	AS	apple		RW
75	NS	they are eating the	accesses device and changes page	QC
76	AS	'animals'		RC
77	NS	oh not that page THIS ONE (point)	points to device screen	I
78	AS	'squirrel'		In
79	NS	squirrel (..) is		QC
80	AS	'squirrel'		Rep
81	NS	eating		QC
82	AS	'where' (..) 'what doing' (.) 'eats' (..) 'where' (.) 'apples'		RC

83	NS	good sentence J (.) [the squirrel is eating] the apples		Pr A
84	AS	[apples]		Rep
85	NS	then what happens? (point)	points to page	QW
86	AS	squirrel (point)	points to page	RW
87	NS	<u>WHERE</u> do they go?	uses Makaton sign for 'where'	QW
88	AS	push squirrel push (point)	points to page	RW
89	NS	(*laughs) push squirrel push (.) shall we see if we can find that on here? (point)	points to device screen	A I
90	AS	[push]		RW
91	NS	[they want] to push (point)	points to device screen	A
92	NS	J (.) shall we see [what doing] if we can find it on here?		AI I
93	NS	they were trying [to] (point)	points to device screen	QC
94	AS	['push']		RC
95	NS	push (point)	points to page then device screen	A
96	AS	push (..) push 'where' (.) 'fence'		Rep In
97	NS	is that what they're trying to do (.) they're trying to [push him through the fence] (point)	points to page	QYN A
98	AS	[push]	turns page	Rep
99	NS	oh (point)	points to page	Co
100	AS	badger		In
101	NS	oh shall we find him on your talker? (point) (.) Who comes to help?	points to device screen	I QW
102	AS	'animals' THIS ONE?	looks at screen and hovers finger over correct button	RI
103	NS	<u>YEH</u> (nods) [that's right]		A
104	AS	['badger'] badger		RW Rep
105	NS	badger (.) [HELP/s]	uses Makaton sign for 'help'	A In
106	AS	[help] (..) push		In
107	NS	helps might be on the talker as well J		I
108	NS	badger <u>PUSH</u> /es (point)  can you [find that on your] talker J (point)	uses gesture for 'push', points to device screen points to device screen	A I
109	AS	[rabbit] (..) badger [pushes]	moves NS hand and turns page	In
110	NS	[badger] pushes		A
111	AS	oh		Co

112	NS	what happens to squirrel? (point)	points to page	QW
113	AS	squirrel		Rep
114	NS	shall we see if that's on your talker J (point)	points to device screen	I
115	AS	[yes]	trues to turn page	RY
116	NS	[wait] a minute (.) look	accesses device and changes page	I I
117	AS	'what doing'		RI
118	NS	I think he flies through the air doesn't he (..) flies		In
119	AS	'flew'		A
120	NS	he flew through the air (point)	points to page	A
121	AS	fly	points to page	A
122	NS	he does fly (.) who flies?		A QW
123	AS	SQUIRREL (point) ooh fly squirrel	takes NS Finger and points at squirrel on page	RW
124	NS	squirrel flies (.) where does he land?		A QW
125	AS	THERE oh	moves NS hand to next picture	Co
126	NS	where is he?		QW
127	AS	baby		In
128	NS	baby squirrel [is]		QC
129	AS	[squirrel] [is]		Rep
130	NS	[can] you tell me on your talker (point) where is he?	points to device screen	I QW
131	AS	'animals' (.) THIS ONE? (point)	hovers finger over button and looks at NS	RI
132	NS	YEH (nods)		A
133	AS	'mummy squirrel'		RW
134	NS	mummy squirrel (.) he goes back to mummy squirrel (point)	points to device screen	A A
135	AS	['where']		RW
136	NS	[where are] they? (.) where are they now? (..) in there		QW QW QC
137	AS	[(*vocalisation)]		
138	NS	[what's] that? (point)	points to page	QW
139	AS	house ['house']		RW
140	NS	[in there] house (.) in the tree		A In
141	AS	house 'forest'		RW
142	NS	yeh it probably is in the forest		A
143	AS	[forest]		Rep
144	NS	[it probably] was in the forest [wasn't it]		A

145	AS	[forest]	turns page and looks at NS uses Makaton sign for 'finish'	A
		FINISH/ed		In
146	NS	FINISH/ed has J finished telling the story?	uses Makaton sign for 'finish'	A
				C
147	AS	yes	closes book	RY
148	NS	good boy J you did a brilliant story today		Pr Pr



## Appendix C8.8

### Participant J: Session Four Personal Narrative – First Day at School

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	PRESS THIS (point)	points to specific button on device screen	I
2	AS	first day at school		RI
3	NS	what does J want to tell me [about school?]		QW
4	AS	'this one?' (point) (*vocalisation)	points to device screen and looks at NS	RW
5	NS	'yes' (nods) you have a look J and you see what you want to tell me	makes eye contact with AS	A I
6	AS	OH NO it's (*unintelligible speech) (...) uh oh	gestures shock by putting hand to mouth	Co
7	NS	what does J play at [school?] (point)	points to device screen	QW
8	AS	[ <i>'play'</i> ]		RW
9	NS	What work does he do? (point) (.)	points to device screen	QW
10	NS	what does J drink at school? (point) what [does he learn?] (point)	points to device screen points to device screen	QW QW
11	AS	[ <i>'chat'</i> ]		RW
12	NS	what does J like reading? (point)	points to device screen	QW
13	AS	'chat'		OD
14	NS	who do you chat with J?		QW
15	AS	[ <i>'chat'</i> ] [ <i>'(vocalisation)'</i> ] (.) 'see'		OD OD
16	NS	do you chat with your <u>FRIEND</u> /s?	uses Makaton sign for 'friend'	QYN
17	AS	'eat' <u>EAT</u>	uses Makaton sign for 'eat'	In Rep
18	NS	what does J <u>EAT</u> at <u>SCHOOL</u> ?	uses Makaton sign for 'eat' and 'school'	QW
19	AS	(*vocalisation)		NPC
20	NS	J eats his		QC
21	AS	school (..) ' <i>read</i> '		Rep OD
22	NS	J eats his sandwiches at school		In
23	AS	' <i>knife</i> ' (..) oh (..) go no		OD Co

24	NS	which school does J [go to?]		QW
25	AS	<i>['watch] watch'</i>		OD
26	NS	J goes to ***School [name***]		In
27	AS	<i>['listen'] (..) 'drink drink' (..) drink</i>		OD Rep
28	NS	good boy (.) If you go back to the other page		Pr I
29	AS	<i>'eat read learn go watch listen drink'</i>		OD
30	NS	all the things J does at school		A
31	AS	<i>'hall' (..) hall</i>		OD Rep
32	NS	what does J do in the hall? (point)	points to device screen	QW
33	AS	hall (..) <i>'eat read learn go watch listen drink hall'</i>		Rep OD
34	NS	you need to clear that J		I
35	AS		accesses device	RI
36	NS	good boy		Pr
37	AS	<i>'school lunches'</i>		OD
38	NS	does J have school lunch or does do you take a lunch box J? (point)	points to two options on device screen	QCH
39	AS	<i>'bell bell'</i>		OD
40	NS	the BELL RINGS bell rings at play time [doesn't it]	makes a gesture imitating ringing a bell	In
41	AS	<i>['assembly'] (..) 'bag'</i>		OD
42	NS	J puts his [BAG away]	uses Makaton sign for 'bag'	In
43	AS	<i>['playground']</i>		OD
44	NS	J [goes in the] playground		In
45	AS	[play] (..) ground [ <i>'playground'</i> ]		Rep
46	NS	[with who (..) WHO do you] play with in the playground J?	uses Makaton sign for 'who'	QW
47	AS	<i>'teacher' (..) 'teacher' (..) 'children'</i>		RW
48	NS	PRESS THIS (point)	points to specific button on device screen	I
49	AS	<i>'school' (..) no</i>	selects button pointed to by NS	RI O
50	NS	with your friends (point)	points to device screen	In
51	AS	oops	accesses device	Co
52	NS	is J HAPPY or SAD	uses Makaton signs for 'happy' and 'sad'	QCH
53	AS	<i>'scared [scared']</i>		OD
54	NS	[or SCARED] or WORRIED at school (.) WHICH [one?]	uses Makaton signs for 'scared', 'worried' and 'which'	QCH
55	AS	<i>['happy'] (..) 'worried' (..) 'scared' (..) 'sad'</i>		OD

56	NS	<u>WHICH</u> one is J at school?	uses Makaton sign for 'which'	QCH
57	AS	ooh [sad] [ <i>'happy worried'</i> ] scared sad'		RCH OD
58	NS	is J <u>SAD</u> at school?	uses Makaton sign for 'sad'	C
59	AS	uh huh		RN
60	NS	no		A
61	AS	<i>'don't like don't like'</i>		OD
62	NS	does J like school or [not like school?] (point)	points to options given on device screen	QCH
63	AS	[no] (.) <i>'quiet'</i> (.) oh quiet		O OD Rep
64	NS	sometimes we have to be QUIET at school don't we	gestures 'quiet' by putting index finger to lips	In
65	AS	<i>'funny'</i>		OD
66	NS	J who are your <u>FRIEND</u> /s at school?	uses Makaton sign for 'friend'	AI QW
67	NS	shall I find your friends page?	moves hand towards device	QYN
68	AS	<u>NO</u>	moves NS' hand away	RN
69	AS	<i>'playground'</i> (.) <i>'hall'</i>		OD
70	NS	(point) J goes in the playground at playtime	points to device screen	In
71	AS	<i>'assembly'</i>		OD
72	NS	(point) J goes in the hall for sports	points to device screen	In
73	AS	<i>'assembly'</i> (.) assembly		OD Rep
74	NS	assembly's on <u>MONDAY</u> don't we	uses Makaton sign for 'Monday'	In
75	AS	assembly (.) <i>'assembly'</i>		Rep
76	NS	Mrs Walton does our assemblies (.) what else do you want to tell me about school J?		In QW
77	AS	<i>'assembly'</i>		OD
78	NS	you like that one assembly?		C
79	AS	<i>'school lunches'</i>		OD
80	NS	J has a lunch box doesn't he		In
81	AS		sits back from device	
82	NS	has J <u>FINISH</u> /ed [talking about <u>SCHOOL</u> ?]	uses Makaton signs for 'finish' and 'school'	QYN
83	AS	<u>FINISH</u> /ed	uses Makaton sign for 'finish'	RY
84	NS	YES good boy	uses Makaton sign for 'yes'	Pr A

## Appendix C9

### Participant J – Linguistic Move-Type

Linguistic Move-Type	Session											
	1			2			3			4		
	Personal AS	Fictional NS	AS	Personal AS	Fictional NS	AS	Personal AS	Fictional NS	AS	Personal AS	Fictional NS	AS
Ready	0	0	0	0	0	0	0	0	0	0	0	0
Instruct	0	4	0	0	1	0	0	11	0	5	0	30
Explain	0	3	0	0	5	0	0	9	0	2	0	6
Inform	2	1	7	4	0	16	3	1	4	7	6	12
Check	18	1	0	1	4	3	0	3	0	6	0	3
Align	0	0	0	0	0	0	0	0	0	6	0	3
Query-YN	0	11	0	0	6	0	15	0	7	0	8	0
Query-W	0	8	0	0	5	0	17	0	11	0	30	0
Query-Choice	0	1	0	0	0	0	1	0	3	0	1	0
Query-Completion	0	2	0	0	0	0	1	0	0	0	10	0
Request help	0	0	0	0	0	0	0	0	0	0	0	0
Acknowledge	0	7	0	0	4	0	17	0	3	1	15	0
Object	0	0	0	0	0	0	0	0	0	0	3	0
Reply-Y	6	16	7	0	3	4	5	1	4	0	3	3
Reply-N	0	1	0	0	1	0	0	0	2	0	0	0
Reply-W	16	0	22	0	4	0	11	0	1	0	15	0
Response to instruction	1	0	8	1	1	0	2	0	5	0	16	0
Reply-Choice	0	0	1	0	0	0	0	0	0	0	0	0
Reply-Completion	2	0	8	0	0	0	1	0	0	0	4	0
Clarify	0	0	0	0	0	0	0	0	0	0	0	0
Praise	0	2	0	0	1	0	7	0	2	0	14	0
Comment	1	0	1	8	1	2	3	8	1	1	3	0
Summarise	0	1	0	0	0	0	0	0	0	0	1	0
Repetition	11	0	25	0	2	0	22	0	2	0	14	0
Operation of device-Other	0	0	0	0	0	0	1	0	23	0	17	0
NPC	0	0	1	0	0	0	0	0	0	0	1	0
<b>Total Preparation Moves</b>	0	0	0	0	0	0	0	1	0	0	0	0
<b>Total Initiation Moves</b>	20	31	7	79	12	20	17	60	1	44	11	94
<b>Total Response Moves</b>	26	27	47	31	10	11	22	33	13	6	42	39
<b>Total Moves</b>	46	58	55	110	22	31	40	94	37	50	71	134

Frequency of Linguistic Move-Type use for each data collection session according to narrative type

## Appendix C10

### Participant J – Linguistic Complexity

	Session	Personal	Fictional
<b>Total Words (Tokens)</b>	1	48	115
	2	56	96
	3	13	47
	4	19	37
	<b>Total</b>	<b>136</b>	<b>295</b>
<b>Different Words (Types)</b>	1	28	25
	2	14	31
	3	10	22
	4	15	20
	<b>Total</b>	<b>67</b>	<b>98</b>
<b>TTR</b>	1	0.58	0.22
	2	0.25	0.32
	3	0.77	0.47
	4	0.79	0.54
	<b>Total</b>	<b>0.49</b>	<b>0.33</b>

Frequency of word use and TTR for Participant J by narrative condition across all data collection sessions

	Session	Personal	Fictional
<b>Content Words</b>	1	46	112
	2	56	95
	3	13	41
	4	17	37
	<b>Total</b>	<b>132</b>	<b>285</b>
<b>Function Words</b>	1	2	3
	2	0	1
	3	0	6
	4	2	0
	<b>Total</b>	<b>4</b>	<b>10</b>

Frequency of content and function word use for Participant J by narrative condition across all data collection sessions

## Appendix C11

### Participant J – Communicative Modality

Communicative Modality	Session																
	1				2				3				4				
	Personal	Fictional	Personal	Fictional	Personal	Fictional	Personal	Fictional	Personal	Fictional	Personal	Fictional	Personal	Fictional	Personal	Fictional	
AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS	AS	NS
Speech	1	11	6	19	0	7	3	16	2	8	4	23	0	10	6	17	
Vocal Gesture	1	0	0	0	1	0	3	1	0	0	0	0	0	0	1	1	
Co-Action	0	0	0	0	0	0	2	2	1	1	0	0	0	0	6	6	
AAC-Encoding	0	2	6	3	1	0	4	0	5	0	13	0	5	0	0	0	
AAC-Output	0	0	2	1	1	0	2	0	6	0	2	0	5	0	6	1	
Eye Gaze - Person	5	6	1	2	1	5	1	2	0	3	1	1	0	3	0	5	
Eye Gaze - Device	16	13	19	17	11	8	19	14	26	24	39	33	20	17	14	17	
Eye Gaze - Other	2	2	16	20	0	0	10	12	0	0	8	13	0	0	15	11	
Facial & Body Gesture	2	4	3	2	0	2	1	0	0	1	0	1	0	0	1	0	
Sign	0	3	0	0	0	0	0	1	0	0	0	0	0	1	0	0	
Env. Reference	4	3	3	14	1	0	0	9	1	2	1	16	1	3	6	11	
Neutral	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NPC	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
<b>Total Coded instances</b>	31	44	56	78	16	22	45	57	42	39	68	87	31	34	55	69	
<b>Total Communicative Acts</b>	31	44	56	78	16	22	45	57	41	39	68	87	31	34	55	69	

Frequency of Communicative Modality use for each data collection session according to narrative

## Appendix C12.1

### Participant O: Session One Fictional Narrative – The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	find the squirrel story		I
2	AS	' <i>the squirrel story</i> '		RI
3	NS	ahhh ok	looks at AS and opens picture book	Co
4	AS	THE SQUIRREL STORY (point)	points at title and looks at NS	In
5	NS	that says squirrel story (point) look begins with a [/s/ doesn't] it	points at title on first page	Ex QYN
6	AS	[yeh]		RY
7	NS	that's right	turns page with AS	A
8	NS	right (.) ok O can you tell J <u>WHAT'S HAPPENING</u>	gestures around the pages with hand	R
9	AS	(point) (*vocalisation) (.) mummy		points at character on page
10	NS	it's mummy		A
11	AS	baby (point)	still pointing at characters	RI
12	NS	and the baby		A
13	AS		accesses AAC device	
14	NS	can you see [the] (point)	points at page	I
15	AS	['fence'] (.) [(vocalisation)] (point)	points at page and looks at NS	In
16	NS	[uhhh there's] the fence I can see the fence (point)	points at page	A Co
17	NS	can you find the mummy one?		I
18	AS	' <i>baby squirrel</i> ' (.)	accesses device puts hand on head	RI
19	NS	oh who's that? (point)	whispered, points to device screen	QW
20	AS	' <i>mummy squirrel</i> '	accesses device	RW
21	AS	[' <i>mouse</i> ']		OD
22	NS	[mm]		A
23	AS	' <i>rabbit garden house house</i> ' (.) ' <i>tree tree</i> '		OD
24	NS	good boy that's taken all the words off	gestures towards the device	Pr Ex

25	AS		accesses device	
26	NS	right <u>LISTEN</u> /ing O	looks at AS and uses Makaton sign for 'listen'	R AI I
27	AS	'fence'		OD
28	NS	<u>LISTEN</u>	NS directs AS' hand away from device	I
29	AS	'fence'		OD
30	NS	[O]		AI
31	AS	['fence'] ['fence']	looks at NS	OD
32	NS	[can you] tell J (point) [what's in] this picture	looks at AS then points to page	I
33	AS	['fence']		OD
34	AS	(*vocalisation) (point)	looks at book and points to page	RI
35	NS	what's in that picture?		QW
36	AS	'house' [( <i>*vocalisation</i> )]		RW
37	NS	[there's] a house yes		A
38	AS	(point) [( <i>*vocalisation</i> )]	points to another part of the page	RW
39	NS	[there is] a house (.) and a sun (.) there's <u>NO</u> picture of a sun there's no sun on there is there?	uses Makaton sign for 'no'	A Ex C
40	AS	'fence fence fence [ <i>fence fence house</i> ']	accesses device	OD
41	NS	[mm no I don't think so] ( <i>*laughs</i> )		Co
42	AS	[( <i>*vocalisation</i> )]		
43	NS	[ok] (.) do you want to turn over?		A QYN
44	AS	'yes'	turns the page with assistance from NS	RY
45	NS	ok (..) can you see (.) what's happening in <u>THIS</u> [PICTURE?]	gestures around page with hand	A QW
46	AS	[ball]		RW
47	NS	ok are they <u>PLAY</u> /ing with a <u>BALL</u> ? (..)	uses Makaton signs for 'play' and 'ball'	A QYN
48	AS		looks at NS then to book	
49	NS	are they <u>PLAY</u> /ing with a ball	uses Makaton sign for 'play'	QYN
50	NS	O (.) do you think you might find some more words (point)	points to device	AI I
51	NS	go have a look see if there's any more (point)	points to device	I
52	AS	( <i>*vocalisation</i> )	accesses device accesses device	RI
53	AS	'stuck'	looks at NS	RI
54	NS	[uhh ( <i>*laughs</i> )]	puts hand to mouth and looks at AS	A
55	AS	[stuck]		In



56	NS	he's not stuck yet is he (point) (.) he's not stuck yet (..) is he	points to page	O O
57	AS	'eat'	accesses device	OD
58	NS	ok they got what else have they [got]		QW
59	AS	['push] push' (.) 'help' (.) 'fly fly go go[go play']		OD
60	NS	[ok O]		AI
61	AS	'stuck'		OD
62	NS	<u>LISTENING</u> listening	moves AS' hand from device	I
63	NS	(point) what is the squirrel going to do with that apple do you think?	points and indicates characters on page	QW
64	AS	(point) (*vocalisation)	points to page	RW
65	NS	what's he going to do?		QW
66	AS	(point) (*vocalisation)	still pointing at page	RW
67	NS	they're <u>HIDE</u> /ing aren't they	uses Makaton sign for 'hide'	Co
68	AS	[(*vocalisation) PUSH]	makes gesture with both hands indicating 'push'	In
69	NS	[they're hiding behind the fence]		Co
70	NS	you think they're going to <u>PUSH</u> him?	uses Makaton sign for 'push'	C
71	AS	yeh		RY
72	NS	you think so (.) shall we have a look on the <u>NEXT PAGE</u> ?	gestures to indicate 'turn page over'	A QYN
73	AS		turns page over	RY
74	NS	O tell J what's happening	indicates page with hand	I
75	AS	'stuck'	looks at ns and smiles	RI
76	NS	<u>OH</u> stuck is he?	puts hand to mouth indicating shock	C
77	AS	yeh		RY
78	NS	oh no (..) what's he going to ask his friends to do?		Co QW
79	AS	(*vocalisation)		
80	NS	what's he going to do? is he going to ask them for some (..)		QW QC
81	AS	(*vocalisation)		RC
82	NS	<u>HELP</u> (.) do you think so?	uses Makaton sign for 'help'	A QYN

83	AS	'stuck'		In
84	NS	he's stuck		A
85	AS		looks at NS and puts hand to mouth	
86	NS	oh no what's he going to do?		QW
87	AS	'stuck'		In
88	NS	he's stuck (..) do you think he's going to (point) ask for some HELP	points to device screen uses Makaton sign for 'help'	A QC
89	AS	'help'		RC
90	NS	help (..) do you think so?		A C
91	AS	yeh		RY
92	NS	yeh and what do you think they're going to do?		A QW
93	NS	how can they help him?		QW
94	AS	'fly' (*vocalisation)		RW
95	NS	'no' (shakes head) how can they help him what they're going to do they're going to PUSH	looks at AS  uses Makaton sign for 'push'	O QW QC
96	AS	<u>PUSH</u>	uses Makaton sign for 'push'	RC
97	NS	push		A
98	AS	'push'		
99	NS	<u>GOOD</u> boy (..) do you think so?	uses Makaton sign for 'good' turns page	Pr QYN
100	AS	(point) (*vocalisation)	points to page	In
101	NS	mmm what's <u>THAT</u> ?	points to what AS pointed to on page	QW
102	AS	(*vocalisation)		RW
103	NS	a worm		A
104	AS		looks at NS	
105	NS	(*vocalisation) (..) right look (point) what's happening on this page then?	points to page	A R QW
106	AS	(point) (*vocalisation)	points to page	RW
107	NS	(point) what's he [doing?]	points to where AS pointed on page	QW
108	AS	<u>PUSH</u> 'push'	uses Makaton sign for 'push'	RW
109	NS	<u>GOOD</u> boy they're pushing him (..) do you think they're going <u>PUUUUUSH</u> like that	uses Makaton sign for 'good' uses Makaton sign for 'push'	Pr A QYN
110	AS	[(*)vocalisation) FLIES]	gestures something flying high and	In

			landing	
111	NS	[do you think they] are?		C
112	NS	oh they need some help don't they (point) who are they going to ask?	points to page	Co QW
113	AS	(*vocalisation)	points to character	RW
114	NS	<u>WHO</u> is he?	uses Makaton sign for 'who'	QW
115	AS	badger		RW
116	NS	badger (.) good boy (.) (point) what's the badger going to do he's going to	points to character	A Pr QW QC
117	AS	vocalisation <u>PUSH</u>	uses Makaton sign for 'push'	RC
118	NS	push		A
119	AS	push		RC
120	NS	push (.) well done		A Pr
121	AS		starts to turn page	
122	NS	ok turning	NS goes to help turn page	A
123	AS	ME	looks at NS and slams page back down and points to himself	In
124	NS	SURPRISE what happens?	puts hands to mouth	QW
125	AS	(*laugh)		
126	NS	is this a funny bit?		QYN
127	AS	yeh		RY
128	NS	is it? (.) what happens? tell me		C QW I
129	AS		turns page over	
130	NS	uh		A
131	AS	LOOK (point) (*laughs)	looks at NS points at page	In
132	NS	what happens? (.) (point) what's he doing?	points to page	QW QW
133	AS	(*vocalisation) FLIES	gestures something flying high and landing	RW
134	NS	he's flying		A
135	AS	yeh (..) 'fly'		RY RW
136	NS	{VERY GOOD/well done} O (.) he's flying (point) [weeeeeeeeeee]	uses Makaton sign for 'very good' points to page	Pr A
137	AS	[(*laughs)] FLYING	uses gesture to indicate 'flying'	
138	NS	through the air		Co
139	AS	(*vocalisation) LANDS	lands hand heavily	In

			on next page	
140	NS	oh look (point) he's landed on his bottom	points to page	Co
141	AS	(*laughs and vocalisation)	looks at NS	A
142	NS	(*laughs) OH DEAR (.) oh dear	looks at AS then puts hand to mouth	Co
143	NS	look what's his mummy saying (point)	points to page	I QW
144	AS	oooohh		RW
145	NS	is she?		C
146	AS	[(*vocalisation)]		RW
147	NS	[ooh is she?] (.) she's saying poor squirrel		C Co
148	NS	VERY GOOD/well done (.) have you FINISH/ed?	looks at AS uses Makaton signs for 'very good' and 'finish'	Pr QYN
149	AS	(*vocalisation)	closes book	RY
150	NS	have you FINISH/ed your story?	uses Makaton signs for 'finish'	C
151	AS	yeh	puts book to side of table	RY
152	NS	that was really good (.) I really liked that		Pr Co

## Appendix C12.2

### Participant O: Session One Personal Narrative – A Birthday

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	what did you have when it was your party O? (.) can you tell me?		QW I
2	AS	'friends'		RW
3	NS	you had <u>FRIEND/s</u> did <u>YOU</u> ?	uses Makaton signs for 'friend' and 'you'	C
4	AS	[(*vocalisation)]		RY
5	NS	[did] you have <u>FRIEND/s</u> from <u>SCHOOL</u> ?	uses Makaton signs for 'friend' and 'school'	QYN
6	AS	yeh		RY
7	NS	did you?		C
8	AS	[yeh]		RY
9	NS	[ooh] and what else happened at your party your birthday party?		A QW
10	AS	'bowling' (*vocalisation)	looks at NS and smiles	RW
11	NS	you went <u>BOWLING</u> [did you?]	uses gesture to indicate 'bowling'	A C
12	AS	[(smiles) (*vocalisation)]		RY
13	NS	who took you <u>BOWLING</u> ?	uses gesture to indicate 'bowling'	QW
14	AS	mummy		RW
15	NS	did she (.) wow		A
16	AS		looks at NS	
17	NS	<u>WHAT</u> else happened at your party?	uses Makaton sign for 'what'	QW
18	AS	'gifts'		RW
19	NS	you had gifts what did you have?		A QW
20	AS	(*vocalisation) TEN	looks at NS and uses fingers to gesture 10	RW
21	NS	you had 10 as well		A Co
22	AS	[(*vocalisation)]		
23	NS	[same as] <u>SAME</u> as <u>ME</u> did you?	uses Makaton signs for 'same' and 'me'	Co C
24	AS	yeh		RY
25	NS	wow		A

26	NS	<u>WHAT</u> what did you have in your presents?	uses Makaton sign for 'what'	QW
27	AS	(*vocalisation) SLEEP	uses Makaton sign for 'sleep'	In
28	NS	<u>SLEEP?</u> you went to sleep?	uses Makaton sign for 'sleep'	O QYN
29	AS	yeh		RY
30	NS	what did you have inside (.) <u>INSIDE</u> your birthday box?	gestures unwrapping a present	QW
31	NS	<u>WHAT</u> was there?	uses Makaton sign for 'what'	QW
32	AS		looks at device and goes to access	
33	NS	i bet i can guess		Co
34	AS	yeh	looks at NS	RY
35	NS	some (.) a game for your DS		In
36	AS	yeh		RY
37	NS	ah i knew it would be (.) wow		Co
38	NS	<u>WHAT</u> else happened?	uses Makaton sign for 'what'	QW
39	AS	'balloons' (*vocalisation)	looks at NS	RW
40	NS	you had balloons	whispered	A
41	AS	(*VOCALISATION) (nods)		RY
42	NS	did you		C
43	AS	yeh (..) 'birthday cake'		RY RW
44	NS	you had birthday cake	whispered	A
45	AS	mm blue	looks at NS	In
46	NS	blue one (.) how many candles?		A QW
47	AS	(*laughs)	looks at NS	
48	NS	can you remember?		QYN
49	AS	ONE	holds up a single finger to indicate 'one'	RW
50	NS	<u>ONE?</u>	holds up a single finger to indicate 'one'	O
51	AS	yeh		RY
52	NS	just 1?		C
53	AS	yeh		RY
54	NS	are <u>YOU</u> 1?	uses Makaton sign for 'you'	QYN
55	AS	no		RN
56	NS	<u>NOOOO</u>	uses Makaton sign for 'no'	A
57	NS	can you remember?		QYN
58	AS		looks around puts hands to mouth	
59	NS	mmmm (.) 9?		QYN

60	AS	yeh		RY
61	NS	9 (.) cor good guess		A Co
62	AS	BLOW	blows hard	In
63	NS	you blew them out		Co
64	AS	yeh [WEEEEEEEE]	gestures the candles flying off cake	RY In
65	NS	[did you] (.) and] they flew off?		A C
66	AS	yeh		RY
67	NS	<u>SAME</u> as <u>J</u> 's	uses Makaton signs for 'same' and 'J'	Co
68	NS	did they fly on the <u>FLOOR</u> ?	gestures toward the floor	QYN
69	AS	WALL (point)	points to wall	RN
70	NS	did they?		QYN
71	AS	WALL (point)	still pointing to wall	RN
72	NS	or the wall? (point)	points to wall	C
73	AS	yeh (*laughs)		RY
74	NS	[noo did they?]	puts hand to mouth	A C
75	AS	[WEEEEEEE]	gestures candles flying and hitting wall	RY
76	NS	oh no		A
77	AS	(*vocalisation)		
78	NS	oh dear (.) did they all go out though?		A QYN
79	AS	yeh		RY
80	NS	oh that's good isn't it (.) did anything else happen at your party?		Co QYN
81	AS	'swimming' (*laughs)	looks at NS	RY
82	NS	you went <u>BOWLING</u> and <u>SWIMMING</u> ?	uses Makaton signs for 'bowling' and 'swimming' looks at AS	QYN
83	AS	(*vocalisation)		
84	NS	did you (.) cor		A
85	AS	'music'		RW
86	NS	and you had <u>MUSIC</u>	uses Makaton signs for 'music'	A
87	AS	'cinema'		RW
88	NS	(*laughs)		
89	AS	(*vocalisation)		
90	NS	you went to the cinema? did you?		QYN C
91	AS	'party games'		RW
92	NS	you played party [games]		A
93	AS	[party]		RW
94	NS	you had a party did you (..) what games did you play at your party then?		A QW

95	NS	did you do musical statues when you have to stand really still?		QYN
96	AS	no		RN
97	NS	oh		A
98	AS	(*vocalisation)		
99	AS	'my xmas' ['my xmas']		OD
100	NS	[we're <u>NOT</u> doing] the xmas one now	uses Makaton sign for 'not'	Ex
101	AS	'my xmas'		OD
102	NS	can you <u>NO</u> /stop (.) go back to the birthday one (point) that's [it]	uses Makaton sign for 'no' points to device screen	I I A
103	AS	['my birthday']		RI
104	AS	(*laughs) DIFFERENT	looks at NS uses Makaton sign for 'different'	Co
105	NS	what's different? they're different <u>BOOK</u> /s i think	uses Makaton sign for 'book'	QW Ex
106	NS	have <u>YOU</u> finished your birthday party story O?	uses Makaton sign for 'you'	QYN
107	AS	no		RN
108	NS	you want to go <u>BACK</u> and tell me some more?	uses gesture to indicate 'back'	QYN
109	AS	'cinema'	looks at NS	In
110	NS	you did go to the cinema		A
111	AS	'yes' (nods)	smiles	RY
112	NS	did you (.) with your <u>FRIEND</u> /s or with <u>MOTHER</u> /mummy and <u>FATHER</u> /daddy	uses Makaton signs for 'friend', 'Mother' and 'Father'	A QCH
113	AS	[(*)vocalisation]	looks at NS	RCH
114	NS	[mummy and daddy]		C
115	AS	YOU (*vocalisation)	points at NS	I
116	NS	<u>MY TURN</u> ?	NS gestures towards self	QYN
117	AS	yeh		RY
118	NS	have you have you <u>FINISH</u> /ed?	uses Makaton sign for 'finish'	QYN
119	AS	yeh		RY
120	NS	yes (.) ok (.) finished		A



## Appendix C12.3

### Participant O: Session Two Fictional Narrative – The Bus Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	right O it's your turn to tell <u>ME</u> the story	NS points to self	R Ex
2	AS	(* <u>VOCALISATION</u> ) (point)	points to first picture in story	In
3	NS	can you tell <u>ME</u> what's happening	points to self	QW
4	AS		tries to turn page	
5	NS	look this page first (.) (point) tell me what's happening	puts back onto the first page points to pictures in sequence	I I
6	AS	(point) BUS RUNNING	points to first picture uses Makaton sign for 'bus' and stamps feet as if running	RI
7	AS	(*vocalisation) (.) bus		RI
8	NS	(point) you can use that to help and you can [ <u>SIGN</u> ]	points to device uses Makaton sign for 'signing'	Ex
9	AS	['bus']		RI
10	NS	ok		A
11	AS		tries to turn page	
12	NS	want to look on the next page?		QYN
13	AS		turns page	RY
14	AS	LOOK (point)	points to first picture and looks at NS	In
15	NS	<u>WHAT</u> 's that?	uses Makaton sign for 'what'	QW
16	AS	(*vocalisation)		RW
17	NS	cross		A
18	AS	'train' (train)	points at the train in the picture	In
19	NS	it's a train (.) it is a train and he's [ <u>cross</u> ]		A S
20	AS	(*vocalisation)	like a train sound 'woo woo'	In
21	NS	it goes woo woo (point)	points at train	A
22	AS	NEXT (*vocalisation)	points to next picture	In
23	NS	what's happening there? (point)	points to picture	QW
24	AS	'tunnel'		RW
25	NS	good [boy]		Pr

26	AS	(*?tunnel)		In
27	NS	go through the tunnel (..) (point) that one?	points at next picture	Co QW
28	AS	'bus driver' (.) (point) (*vocalisation)	points at next picture	RW
29	AS	'spanner' (.) 'policeman' [(?vocalisation)]	points at picture	RW
30	NS	mm policeman (point) what's he doing?	points at picture	A QW
31	AS	'whistle'		RW
32	NS	blowing his whistle isn't he well done (.) ok	turns page	A Pr R
33	NS	uh what's happening here O?		QW
34	AS	(*vocalisation) (point)	points to middle picture	RW
35	NS	can you tell me what's happened?		QW
36	AS	'train'	looks at device screen and gasps	RW
37	NS	there's a train? (.) he's gone not in this picture is he? (point)	points to pictures	O Ex C
38	AS	'bus' (.) (*vocalisation)		RW
39	NS	it's the bus (.) what's happened to him? (point)	points to picture	A QW
40	AS	(*vocalisation) (point) OVER	points to picture and uses gesture to indicate 'jumping over'	RW
41	NS	he's gone OVER	uses gesture to indicate going over something	QC
42	AS	(*vocalisation) OVER	uses gesture to indicate going over something	RC
43	NS	over the		QC
44	AS	fence (point)	points to picture	RC
45	NS	fence (.) good talking (.) over the fence		A Pr A
46	NS	think he's going a bit too fast do you O?		Co QYN
47	AS		runs finger across pictures	
48	NS	do you think he's going a bit too fast?		QYN
49	NS	look at that (point) d'you think he's going to hit that cow?	points at picture	I QYN
50	AS	no		RN
51	NS	no i don't think so		Co
52	AS		turns page	
53	NS	uh what happens here? (point)	points to picture	QW

54	AS	DOWN THE HILL weeeeeee	uses hand to gesture moving down a hill quickly	RW
55	NS	(DOWN THE HILL) he goes weeeee (. ) down the	copies AS' gesture for down hill	A QC
56	AS	(*vocalisation) (. ) 'hill'		RC
57	NS	down the hill good [boy]		A Pr
58	AS	[(*vocalisation)] (point)	points to picture	In
59	NS	he's chasing him (point) (. ) he's nearly caught him hasn't he (. ) into the	points to same picture	A In QC
60	AS	(*?water)		RC
61	NS	water (. ) (point) and then he goes back into his bus again	points to next picture	A In
62	NS	what a naughty bus		Co
63	AS		closes book	
64	NS	do you think it's a naughty bus?		QYN
65	AS		looks at NS, no clear response	
66	NS	have you finished?		QYN
67	AS	yeh		RY
68	NS	yeh (. ) <u>GOOD</u> /great story (. ) well done	uses Makaton sign for 'good'	A Pr Pr

## Appendix C12.4

### Participant O: Session Two Personal Narrative – A Christmas

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	it's <u>O</u> 's turn now you tell me a story [about christmas]	points to AS	R I
2	AS	[(*vocalisation)]		
3	NS	what happened at your christmas <u>O</u> ?		QW
4	AS	(*vocalisation) <u>TREE</u> (*vocalisation)	looks at NS and uses Makaton sign for 'tree'	RW
5	AS	' <i>christmas tree</i> '		RW
6	NS	you had a christmas <u>TREE</u> did <u>YOU</u> ?	uses Makaton signs for 'tree' and 'you'	C
7	AS	yeh	looks at NS	RY
8	NS	really (.) what colour?		A QW
9	AS	(*vocalisation) <u>WHITE</u>	looks away from NS uses Makaton sign for 'white'	RW
10	NS	was it was it <u>WHITE</u> ?	uses Makaton sign for 'white'	QYN
11	AS	yeh	looks at NS	RY
12	NS	you had a <u>WHITE</u> christmas tree	uses Makaton sign for 'white'	C
13	AS	yeh (point) <u>YOU</u> ?	points at NS	RY
14	NS	not <u>GREEN</u>	uses Makaton sign for 'green'	C
15	AS	no		RN
16	NS	wow (.) a white christmas tree		A
17	AS	(point) <u>YOU</u>		QW
18	NS	yeh mine was <u>GREEN</u> (.) your's was <u>WHITE</u> (.) [wow]	uses Makaton signs for 'green' and 'white'	RW A
19	AS	(point) <u>YOU</u> [(*)vocalisation]	points to researcher	QW
20	NS	i don't know what colour <u>P</u> 's was i don't know		RW
21	NS	(point) what (.) what else did <u>YOU</u> have at christmas?	points at AS	QW
22	AS	' <i>family</i> '		RW
23	NS	who was there? <u>YOU</u> (point) (.) what were their <u>NAME</u> /s?	points to AS uses Makaton sign for 'name'	QW QW

24	AS	<u>BROTHER</u>	uses Makaton sign for 'brother'	RW
25	NS	your <u>BROTHER</u>	uses Makaton sign for 'brother'	A
26	AS	yeh		RY
27	NS	<u>J</u>	uses Makaton sign for 'J'	C
28	AS	yeh		RY
29	NS	<u>J</u> was there	uses Makaton sign for 'J'	C
30	AS	yeh		RY
31	NS	who else was there?		QW
32	AS	mummy		RW
33	NS	<u>MOTHER</u> /mum	uses Makaton sign for 'mother'	A
34	AS	daddy		RW
35	NS	<u>FATHER</u> /dad	uses Makaton sign for 'father'	A
36	AS	yeh		RY
37	NS	anyone else?		QYN
38	AS	no		RN
39	NS	[no one]		C
40	AS	[nanny]		RY
41	NS	nanny was there (..) was was B there?		A QYN
42	AS	'presents'		In
43	NS	you had presents		A
44	AS	yeh		RY
45	NS	<u>WHERE</u> were the presents?	uses Makaton sign for 'where'	QW
46	NS	where were they?		QW
47	AS	UPSTAIRS	points upwards	RW
48	NS	were they <u>UNDER</u> the <u>TREE</u> ?	uses Makaton sign for 'under' and 'tree'	QYN
49	AS	(*vocalisation)		RN
50	NS	or were they in your bedroom?		QCH
51	AS	in bedroom		RCH
52	NS	in your bedroom (*laughs) (.) who put them there?		A QW
53	AS	(*vocalisation)		RW
54	NS	who did it?		QW
55	AS	'father christmas'		RW
56	NS	oh did he (.) oh did you have lots? (..) did you have lots? (.) lucky i fixed his sleigh then		A QYN QYN Co
57	AS	'decorations [decorations']	looks at NS	In
58	NS	[you had] decorations		A
59	AS	'the bus story'		OD

60	NS	not the bus story we're on a christmas one now aren't we		Ex
61	AS	(*vocalisation)		
62	NS	remember what else? (.) can you tell me some more about [christmas?]		QW I
63	AS	<i>['my christmas']</i>		RI
64	AS	<i>'play games'</i>		RW
65	NS	you play games	whispered	A
66	NS	[what games do you play?]		QW
67	AS	[ball (.) ball]		RW
68	NS	you play with a ball		A
69	AS	yeh		RY
70	NS	did you get a ball for christmas?		QYN
71	AS	yeh		RY
72	NS	a new ball		C
73	AS	yeh		RY
74	NS	did you		A
75	AS	<i>'give'</i>		In
76	NS	and did <u>YOU</u> give a present to somebody?	points to AS	QYN
77	AS	yeh		RY
78	NS	who did <u>YOU</u> give your present to?	points to AS	QW
79	NS	can i guess?		QYN
80	AS	BROTHER (*vocalisation)	uses Makaton sign for 'brother'	RW
81	NS	your <u>BROTHER</u>	uses Makaton sign for 'brother'	A
82	AS	yeh		RY
83	NS	did you (.) what did you give J? (.) do you remember?		A QW QYN
84	AS	<i>'Nintendo DS games'</i>		RW
85	NS	<u>YOU</u> gave J (.) a DS game	points to AS	C
86	AS	(*VOCALISATION) (nods)	looks at NS	RY
87	NS	what did he say? (.) what did [he say]		QW
88	AS	[(*vocalisation)] THANK YOU	uses Makaton sign for 'thank you'	RW
89	NS	he say <u>THANK YOU</u> ?	uses Makaton sign for 'thank you'	C
90	AS	<u>YEH</u> (nods)		RY
91	NS	did he <u>SHARE</u> it with you? did you have a turn? (	uses gesture to indicate 'sharing'	QYN QYN
92	AS	yeh		RY
93	NS	did you		C
94	AS	yeh		RY
95	NS	wow (..) did you have		A

		anything nice to eat?		QYN
96	AS	'yes' (nods) 'christmas dinner'		RY
97	NS	oh (.) what did YOU have for christmas dinner?	points to AS	A
				QW
98	AS	(*vocalisation)		RW
99	NS	did you have fish and chips?		QYN
100	AS	yeh		RY
101	NS	you had yeh? (.) or turkey?		O
				QCH
102	AS	turkey		RCH
103	NS	turkey did you (..) wow (.) how lovely		A
				A
104	NS	who cooked your christmas dinner?		QW
105	AS	mummy		RW
106	NS	did she (.) how lovely		A
107	AS	oh no (.) no no no	accesses device then puts hand to mouth	Co
108	NS	it's ok (.) go back if you've done it wrong (.) it's ok		A
				I
				A
109	AS	'story time' (.) (*vocalisation) (point)	points to device screen	RI
110	NS	so we're still talking about christmas or have you FINISHE/ed	uses Makaton sign for 'finish'	Ex QYN
111	AS	'my christmas' (.) 'story time' (.) 'my christmas' (..) 'give'	looks at NS	RN
				In
112	NS	so you gave a present to J did you (.) did you give a present to anyone else?		S
				QYN
113	AS	mummy		RY
114	NS	you gave a present to mummy (.) what did you give mummy?		A
				QW
115	AS	'Nintendo DS [games']	looks at NS and smiles	RW
116	NS	[mummy had] a Nintendo as well?		QYN
117	AS	(*vocalisation)		RY
118	NS	has mummy got one of those?		QYN
119	AS	[(*vocalisation)]		
120	NS	[has she]		C
121	AS	'I have finished'		OD
122	NS	<u>YOU</u> have finished	points to AS	QYN
123	AS	no		RN
124	NS	<u>NO</u> ?	uses Makaton sign for 'no'	C
125	AS	'unwrap'	bad pronunciation by device	In

			AS looks at NS	
126	NS	unwrap that is (*laughs)	looks at device screen then AS	Ex
127	AS	'unwrap'		In
128	NS	did you unwrap your presents? when <u>YOU</u> unwrap your presents do you do it <u>SLOWLY</u> or do you <u>RIP IT OFF</u> ?	points to AS  uses gesture to indicate slowly and then ripping off paper	QYN QCH
129	NS	what do you do?		QW
130	AS	(*vocalisation) SLOWLY	uses gesture to indicate 'slowly'	RCH
131	NS	you do it <u>SLOWLY</u> do you you just take one little bit off then have a <u>LOOK</u> [inside]	uses gesture to indicate 'slowly' uses Makaton sign for 'look'	A Co
132	AS	[(*laughs)]		
133	NS	do you?		C
134	AS	<u>YOU</u>	points to NS	QW
135	NS	no i just <u>RIP IT OFF</u>	uses gesture to indicate 'ripping paper off'	RW
136	AS	(*vocalisation) YOU	points to researcher	QW
137	NS	(*laughs) 'no' (shakes head) I don't know		RW
138	AS	(*vocalisation) RIPS IT OFF	uses gesture to indicate ripping paper off	In
139	NS	does she rip it off as well?		QYN
140	AS	yeh	looks at researcher	RY
141	NS	i don't know (.) what about <u>YOU</u> (.) i bet <u>B</u> and <u>S</u> i bet they rip it off do they?	points to AS uses Makaton signs for 'B' and 'S'	A QYN
142	AS	(*vocalisation) SLOWLY	looks at NS and uses gesture to indicate 'slowly'	RN
143	NS	they do it slowly? (.) do they?		A C
144	AS	yeh		RY
145	NS	oh you're very good aren't you (.) i bet you had lots and lots of presents didn't you		Co Co
146	AS	(*laughs)	Looks at NS	
147	NS	did you		QYN
148	AS	'have fun'		In
149	NS	you had fun (.) you had a really <u>GOOD</u> time did you?	uses Makaton sign for 'good'	A C
150	AS	'go'	uses Makaton sign for 'gof'	In



151	NS	did you <u>GO</u> anywhere?		QYN
152	AS	yeh		RY
153	NS	where did you go?		QW
154	AS	(*vocalisation)	reaches for storybook	RW
155	NS	don't know (.) have you <u>FINISH</u> /ed that one then?	uses Makaton sign for 'finish'	A QYN
156	AS	no		RN
157	NS	<u>NO</u> (.) ok	uses Makaton sign for 'no'	A A
158	AS	(*vocalisation) (*?BROTHER)	uses a sign but unreadable, possibly 'brother'	In
159	AS	'sing carols'		In
160	NS	do [you sing?]		C
161	AS	[ <i>'sing carols'</i> ]		RY
162	NS	<u>YOU</u> you're good at singing [aren't you]	points to AS	Co
163	AS	'put up decorations'		In
164	NS	we had decorations		A
165	AS	'eat'		OD
166	AS	(*vocalisation)	accesses device and goes back to page with other stories on	OD
167	NS	would you like the <u>BUS</u> story now <u>O</u> ? (point)	uses Makaton sign for 'bus' and points to AS	QYN
168	AS	'the squirrel story'		OD
169	NS	O STOP (.) <u>LISTEN</u> /ing	touches AS arm to stop him accessing device uses Makaton sign for 'listen'	AI I
170	NS	the squirrel story has finished (.) if you've finished the christmas one you can do your bus story next		Ex Ex
171	AS	(*vocalisation) [ <i>'the bus story'</i> ] [yeh]		RY
172	NS	you'd like to do that (.) O		C
173	AS	yeh		RY
174	NS	<u>YES</u> or <u>NO</u>	uses Makaton signs for 'yes' and 'no'	QYN
175	AS	<u>YES</u>	uses Makaton sign for 'yes'	RY
176	NS	yes (.) ok (.) alright then that was absolutely i really loved that story it was fantastic (.) well done you	gives AS a high five	A A Pr Pr

## Appendix C12.5

### Participant O: Session Three Fictional Narrative – Peter and the Cat

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	ok would you like to tell <u>ME</u> that story now?	NS points to self	R QW
2	AS	'yes' (gives slight nod)	picks up book	RY
3	NS	ok you can use <u>THIS</u> look (.) find the right one and you can talk to me and tell me the story	picks up device and moves it in front of AS	A Ex I Ex
4	AS	(( <i>*vocalisation</i> ))		A
5	NS	do you want to <u>USE</u> this (.) or your <u>FINGER</u> ?	picks up stylus	QCH
6	AS	<u>THAT</u> (.) [ <i>*vocalisation</i> ]	takes stylus	RCH
7	NS	NS:[that ok ]		A
8	AS		accesses device	
9	NS	ok		A
10	AS	' <i>peter and the cat</i> '	opens book	In
11	NS	ok	positions book	A
12	AS	(.) ( <i>*vocalisation</i> )	accesses device	A
13	AS	( <i>*vocalisation</i> )	pats first page of book	In
14	NS	USE THIS	points toward device	I
15	AS	' <i>turtle</i> ' (.) (point) ( <i>*vocalisation</i> )	accesses device points to part of page	In
16	NS	he hasn't got a turtle has he (.) it was the turtle was on the front page wasn't it you remember? (.) it was on that page (point) wasn't it	turning page back points to page then turns back to page they were on	O Ex C Ex
17	AS	(.) ' <i>cat</i> '	accesses device	In
18	NS	the cat (point) (.) and <u>WHERE</u> (.) where is the <u>CAT</u> ?	points to cat on page uses Makaton signs for 'where' and 'cat'	A QW
19	AS	' <i>tree</i> '		In
20	NS	<u>IN</u> a <u>TREE</u> (..) goodness me (.) is he stuck? (point)		A Co

				QYN
21	AS	(*vocalisation)		
22	NS	I think so do you?		Co C
23	AS	'yes' (nods)		RY
24	NS	mmm		A
25	AS	'bag'	starts to turn page	In
26	NS	bag (.) where's his bag? (point)	points to page	A QW
27	AS	THERE (point)	turns page points to page with stylus	RW
28	NS	it's out down <u>ON</u> the floor isn't it		In
29	NS	what's peter doing? (point)	points to page	QW
30	AS	boy 'tree'	looks at NS	In
31	NS	he's <u>CLIMB</u> /ing the <u>TREE</u> isn't he to try and get the cat (point)	uses Makaton signs for 'climb' and 'tree'	A In
32	AS		turns page	
33	NS	ok (..) <u>UH OH</u> what's happening now?	puts hand to mouth	A Co QW
34	AS	'boy cat tree'		In
35	NS	<u>GOOD</u> boy that's great (.) the <u>BOY</u> and the <u>CAT</u> are in the tree	uses Makaton signs for 'good', 'boy' and 'cat'	Pr S
36	NS	i wonder if there's any more words we can use (point) (.) d'you think there might be some more?	points to device	Co C
37	AS		accesses device	RY
38	NS	oh yeh we might need some of <u>THESE WORDS</u> mightn't we in a minute	gestures toward device and indicates words	A Ex
39	NS	and what d'you think he's shouting?		QW
40	AS	help!		RW
41	NS	help help!		A
42	AS	(*vocalisation)		
43	NS	oh know		Co
44	AS	'bush'		In
45	NS	and <u>WHO</u> do you think can <u>HEAR</u> him?	uses Makaton sign for 'who' and 'hear'	QW
46	AS	<u>NO</u> (shakes head)		RW
47	NS	[ <u>NO</u> -one]	uses Makaton sign for 'no'	C
48	AS	[ <u>MAN</u> ]	uses Makaton sign for 'man'	RW
49	NS	you think the <u>MAN</u> will hear him	uses Makaton sign for 'man'	C
50	AS		turns page	
51	NS	mm		A
52	AS	'man' (.) 'hosepipe'		In

53	NS	yes he has (point) he's got his <u>HOSEPIPE</u> [hasn't he]	points to page gestures watering garden with hosepipe	A
54	AS	[(*vocalisation)]		A
55	NS	and the boy's shouting (point)	points to page	S
56	AS	help		In
57	NS	<u>HELP</u>	puts hand to mouth to indicate shouting	A
58	AS		turns page	
59	NS	huh (.) and what does (point) (.) what happens next?	points to page	QW
60	AS	'ladder' (.) 'man'		In
61	NS	good boy 'yes' (nods) (.) he gets his ladder		Pr S
62	AS	oh	accesses device	A
63	NS	ok		A
64	AS	'tree'		In
65	NS	good boy (.) good boy (nods) 'yes' (.) he puts his ladder on the <u>TREE</u>	uses Makaton sign for 'tree'	Pr Pr A
66	AS		turns page	
67	NS	oh thank goodness and he comes down and he says [thank you] (point)	points to page	Co In
68	AS	[(*unintelligible speech)] (.) 'boy' (.) 'peter' (.) 'boy boy' (.) 'peter [peter]'		In OD
69	NS	that's right and he comes down what happens next do you remember?	makes hand gesture – not possible to identify what this represents	A S QW
70	AS	mummy		RW
71	NS	oh he goes and finds his (..) mummy	turns page	A
72	AS	'mummy'		Rep
73	NS	mmm he tells mummy all about it doesn't he		A In
74	AS		turns page to end of book	
75	NS	that was great (.) have you <u>FINISH</u> /ed?	uses Makaton sign for 'finish'	Pr QYN
76	AS	yeh	closes book	RY
77	NS	oh THANK YOU that was a [GOOD/great story i really loved that STORY]	uses Makaton signs for 'thank you', 'good' and 'story'	Co Pr Co
78	AS	[(claps)]		
79	NS	thank you O (.) <u>GOOD</u> boy well done	uses Makaton sign for 'good'	Co Pr

## Appendix C12.6

### Participant O: Session Three Personal Narrative – Pets

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	NS	would you like to tell me about yours (.) your pets you've got at home what have <u>YOU</u> got at home (.) O?	points to AS	QW Ex QW
2	AS	(.) 'cat'	moves device towards self and takes stylus from NS	RW
3	NS	<u>YOU</u> 've got a cat	points to AS	A
4	AS	(shakes head) (*vocalises)		RY
5	NS	how many cats have <u>YOU</u> got?	points to AS	QW
6	AS	(*vocalisation) <u>ONE</u>	lifts one finger to indicate 'one'	RW
7	NS	<u>ONE</u> (.) same as me (.) what's <u>YOUR</u> cat's name?	gesture 'one' by holding up one finger gesture towards AS	A Co QW
8	AS	(*vocalisation)		RW
9	NS	oh really (.) right (.) <u>WHAT</u> happens? (.) what have you got any other <u>DIFFERENT</u> ones or have you just got <u>ONE</u> cat?	uses Makaton signs for 'what' and 'different' uses gesture to indicate 'one'	A R QW QCH
10	AS	'dog'		RW
11	NS	you've got a dog?		C
12	AS	(nods) (* <u>VOCALISATION</u> )		RY
13	NS	have you (.) what's your <u>DOG</u> 's <u>NAME</u> ?	uses Makaton signs for 'dog' and 'name'	A QW
14	AS	<u>NO</u>	uses negative hand gesture	RW
15	NS	you don't know (shakes head) (.) ok (.) anything else?		A A QYN
16	AS	'fish'		RY
17	NS	you've got a <u>FISH</u> ?	uses Makaton sign for 'fish'	C
18	AS	<u>YEH</u> (nods)		RY
19	NS	have you		A
20	AS	(*vocalisation)		RY
21	NS	ok (.) are you telling me something about your <u>DOG</u> that you've got at home?	uses Makaton sign for 'dog'	A QYN

22	AS	'pet food'		In
23	NS	your dog eats food (.) does he eat <u>LOTS AND LOTS</u> of food?	uses gesture to indicate 'lots'	A QYN
24	AS	'cat' (.) 'pet food'		In
25	NS	and the cat eats food (..) who buys all the food for your dog and your cat?		A QW
26	AS	mum		RW
27	NS	mum does does she (.) oh right		A
28	NS	do you take your dog out for a walk sometimes?		QYN
29	AS	mm daddy		RN
30	NS	daddy does does he		A
31	AS	'hutch'		In
32	NS	who lives in a hutch?		QW
33	AS	'guinea pig'		RW
34	NS	the guinea pig		A
35	AS	guinea <u>PIG</u>	uses Makaton sign for 'pig'	A
36	NS	guinea pig <u>YEH</u> (nods) (..) who looks after guinea pig		A QW
37	AS	'hamster'		In
38	NS	and a hamster (.) does your mummy know all this O?		A QYN
39	AS	no		RN
40	NS	no (.) who looks after do <u>YOU</u> help?	points to AS	A QW
41	AS	(*vocalisation)		NPC
42	NS	do you?		QYN
43	AS	yeh		RY
44	NS	what do you do to help then?		QW
45	AS	'cage'		In
46	NS	who lives [in a cage?]		QW
47	AS	[ <i>'cat</i> ] <i>cat'</i> (.) ' <i>rabbit rabbit</i> ' (.) ' <i>guinea pig</i> '	nods head	OD
48	NS	mmm		A
49	AS		accesses device	
50	NS	STOP that's it (.) that's it that's pets one finished (point)	moves AS' hand from device points to device	I Ex
51	NS	have you <u>FINISH</u> /ed telling me about your pets O?	uses Makaton sign for 'finish'	QYN
52	AS	yeh		RY
53	NS	yes?		C
54	AS	[yeh]		RY
55	NS	[thank] you that was really good boy well done (.) thank you for that		Co Pr

## Appendix C12.7

### Participant O: Session Four Fictional Narrative – The Squirrel Story

	NS/AS	Interaction	Comment/Non-verbal communication	Linguistic Move-Type
1	AS	(*VOCALISATION)	points to self	I
2	NS	your turn oh yes please i'd like to hear it		A Co
3	AS	(*vocalisation)	reaches for device	Co
4	NS	ok open it up		A I
5	AS	(point) [( <i>*vocalisation</i> )]	points to book	Co
6	NS	[it's a bit] upside down <u>YES</u> (nods)		A
7	AS	(*laughs)		
8	NS	ok turn it round		A I
9	AS		turns book round	RI
10	NS	that's it	moves device toward AS	A
11	AS		starts to open book	
12	NS	ok (.) would you like me to turn the pages while you do (point) (.) [your communicator]	points to device	A QYN
13	AS	[YEH]	hands book to NS	RY
14	NS	ok (.) <u>THERE YOU GO</u>	hands stylus to AS	A Co
15	NS	ok [right]	opens book	A R
16	AS	[ <i>'the squirrel story'</i> ] (.) ( <i>*vocalisation</i> )		In
17	NS	ok		A
18	AS	<i>'baby squirrel'</i> ( <i>*vocalisation</i> )		In
19	NS	uh huh		A
20	AS	<i>'mummy squirrel'</i> <u>THERE</u> (point)	points to character on page	In
21	NS	mummy squirrel (point)	points to page	A
22	AS	<i>'fence'</i> ( <i>*vocalisation</i> )	tries to turn page	In
23	NS	yeh (.) ok	turns page	A R
24	NS	oh (.) <u>WHO</u> comes along? (point) who's he playing with?	points to characters on page	QW QW
25	AS	<i>'rabbit'</i> (.) <i>'mouse'</i>		RW
26	NS	and mouse well done (.) and where are they hiding? (point)	points to next page	A Pr

				QW
27	AS	fence (point) 'fence'	points to page	RW
28	NS	oh behind the fence well done	turns page	A Pr
29	NS	oh what happens now?		QW
30	AS	'baby squirrel fence'		RW
31	NS	ok (.) is the there might might be some more words if you need them (point) (.) ok you might need them in a minute	points to device screen turns page	A Ex Ex
32	AS	(*vocalisation) (point)	points to device with stylus	A
33	NS	oh that's all of the story (..) ok right (.) what happens (point) (.) he gets	looks at book then device points to page	Co R QW QC
34	AS	stuck		RC
35	NS	stuck doesn't he (.) and who comes along to help him?	turns page	A QW
36	AS	badger	gestures toward page	RW
37	NS	'yes' (nods) badger (.) that's right		A
38	AS	(*vocalisation) I DON'T KNOW	accesses device shrugs shoulders	Co
39	NS	oh its decided not to do that one	accesses device	Ex
40	NS	ok so badger gives a big PUSH	uses gesture to indicate 'push'	A QC
41	AS	<u>PUSH</u> [(*)vocalisation]	uses gesture to indicate 'push'	RC
42	NS	[push] and what happens?		A QW
43	AS	(*vocalisation)	turns page with NS	RW
44	NS	he flies through the air (point)	points to page	In
45	AS	[(*)vocalisation] FLIES	uses gesture to indicate 'flying'	A
46	NS	[oh my] goodness (.) and ends up (.) where is he now? (point)	points to page	Co QC QW
47	AS	mummy (point)	points to page	RW
48	NS	with his mummy yeh (point) (.) on a TREE	points to page indicates specific part of page	A QC
49	AS	his bum		RC
50	NS	(*laughs) his bum		A
51	AS	(*laughs) (point)	points to page	A
52	NS	i think so yes (point)	points to page	A
53	AS	(*vocalisation)		NPC
54	NS	do you think it hurt?		QYN
55	AS	(shakes head) NAH	gives eye contact	RN



56	NS	<u>NO</u> (.) think he's ok	uses Makaton sign for 'no'	A C
57	AS	yeh		RY
58	NS	he looks like he's quite happy doesn't he (point) (.) do you think he's laughing?	points to page	Co QYN
59	AS	yeh		RY
60	NS	i think so too (.) oh well done O (.) that was fantastic	turns page to end of book	A Pr Pr
61	AS	(*vocalisation)		A
62	NS	thank you (.) thank you for that story that was really good		Co Pr



26	AS	'playground'		OD
27	NS	do you play <u>HIDE</u> /ing games in the play ground	uses Makaton sign for 'hide'	QYN
28	AS	(nods) <u>YEH</u>	gives eye contact	RY
29	NS	do you		C
30	AS	yeh		RY
31	NS	what do <u>WHAT</u> else do you like to play with?	uses Makaton sign for 'what'	QW
32	AS	(*vocalisation)		NPC
33	NS	there might be some more words if you want to have a look (point)	points to device screen	In I
34	AS		accesses device	RI
35	AS	'lunch'		In
36	NS	you have your lunch (.) you do like your lunch don't you (.) what's your favourite O?		A Co QW
37	AS	(*vocalisation)		RY
38	NS	is it (.) erm (.) is it like that one sausage (point) (.) sausage and peas and mash?	points to device screen	QYN
39	AS	[(* <u>VOCALISATION</u> ) (nods)]		RY
40	NS	[is it like] that (.) is it (.) mmm		A A
41	AS	'homework'		In
42	NS	you come on the school [bus don't you]		QYN
43	AS	[ <u>'school bus'</u> ]		RY
44	NS	what are <u>YOUR</u> (.) who <u>WHO</u> (.) <u>WHO</u> are your new <u>FRIEND</u> /s O? (signs who and friend)	touches AS on shoulder uses Makaton signs or 'who' and 'friend'	QW
45	AS	(*vocalisation)		NPC
46	NS	who are your friends?		QW
47	AS	'friends'		RW
48	NS	<u>J</u> ?	uses Makaton sign for 'J'	QYN
49	AS	yeh		RY
50	NS	and what about <u>E</u> ?	uses Makaton sign for 'E'	QYN
51	AS	no		RN
52	NS	<u>NO</u> ?	uses Makaton sign for 'no'	C
53	AS	(*vocalisation)		RN
54	NS	ermm (.) who else have you got (.) I	uses Makaton sign for 'I'	Co QYN
55	AS	yeh	smiles, gives eye contact and puts hands to mouth and laughs	RY
56	NS	is I funny?	copies gesture and laughs	QYN

57	AS	yeh		RY
58	NS	is he your <u>VERY GOOD</u> /good <u>FRIEND</u> (.) is he	uses Makaton signs for 'very good' and 'friend'	QYN
59	NS	what about erm (.) i'm trying to think about who you've got (.) <u>S</u>	uses Makaton sign for 'S'	Ex QYN
60	AS	(nods) <u>YEH</u>	gives eye contact	RY
61	NS	<u>YEH</u> (nods) is he your friend (.) erm (.) <u>D</u>	gives eye contact uses Makaton signs for 'yes' and 'D'	A Co QYN
62	AS	yeh [(vocalisation)]		RY
63	NS	[ <u>YEH</u> ] (.) ermm (.) <u>J</u>	uses Makaton signs for 'yes' and 'J'	A QYN
64	AS	yeh		RY
65	NS	yeh (.) cor you've got lots of friends haven't you (.) lots of friends		A Co
66	AS	(*vocalisation) THIS (point)	reaches over and moves fictional stimuli towards himself then points to cover	Co
67	NS	that's (.) we're not ready for that one yet (.) unless you've finished your story (point) (.) have you finished [your story?]	points to device	Ex QYN
68	AS	[yeh]		RY
69	NS	you have finished it (.) ok then (.) thank you that was really nice i like hearing about your friends (.) really good		A A Co Pr Co Pr

# Appendix C13

## Participant O – Linguistic Move-Type

Linguistic Move-Type	Session																							
	1						2						3						4					
	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS	Personal AS	Fictional NS		
Ready	0	0	0	3	0	1	0	0	2	0	1	0	0	1	0	0	0	1	0	0	0	3		
Instruct	1	3	0	13	0	4	0	3	0	0	1	0	0	1	0	0	0	2	0	0	2	1	2	
Explain	0	2	0	3	0	5	0	3	0	0	2	0	0	2	0	0	0	5	0	0	2	0	3	
Inform	5	1	11	0	12	0	7	2	2	5	0	14	4	0	4	1	4	1	4	1	4	1	1	
Check	0	11	0	9	0	17	0	1	0	0	3	0	0	0	0	0	0	5	0	0	4	0	1	
Align	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Query-YN	0	17	0	10	0	27	0	6	0	0	7	0	0	0	0	0	0	2	0	0	13	0	3	
Query-W	0	12	0	22	4	20	0	9	0	0	12	0	0	0	0	0	0	9	0	0	8	0	8	
Query-Choice	0	1	0	0	0	3	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	
Query-Completion	0	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Request help	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Acknowledge	0	24	1	28	0	34	0	14	0	1	17	4	20	0	0	0	0	0	0	0	0	0	0	
Object	0	2	0	3	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
Reply-Y	22	0	10	0	29	0	2	0	2	0	8	0	4	0	0	0	0	0	0	16	0	0	0	
Reply-N	5	0	0	0	7	0	1	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	
Reply-W	12	0	16	0	20	4	10	0	0	7	0	5	0	0	0	0	0	0	4	0	0	0	0	
Response to instruction	1	0	8	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	
Reply-Choice	1	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Reply-Completion	0	0	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Clarify	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Praise	0	0	0	8	0	2	0	6	0	0	1	0	7	0	0	0	0	0	0	0	2	0	0	
Comment	1	8	0	12	1	6	0	4	0	0	2	0	9	1	8	3	6	0	0	0	0	0	0	
Summarise	0	0	0	0	0	1	0	1	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	
Repetition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Operation of device-Other	2	0	10	0	5	0	0	0	0	1	0	2	0	0	0	0	0	0	0	2	0	0	0	
NPC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	
<b>Total Preparation Moves</b>	0	0	0	3	0	1	0	2	0	0	1	0	0	1	0	0	0	1	0	0	0	0	3	
<b>Total Initiation Moves</b>	6	47	11	66	16	77	7	28	5	26	14	28	4	30	5	22	0	0	0	4	30	5	22	
<b>Total Response Moves</b>	44	34	50	51	67	48	20	26	19	20	17	41	26	25	21	35	0	0	0	26	25	21	35	
<b>Total Moves</b>	52	81	71	12	88	12	27	56	26	47	33	70	35	55	27	60	0	0	0	35	55	27	60	

Frequency of Linguistic Move-Type use for each data collection session according to narrative type

## Appendix C14

### Participant O – Linguistic Complexity

	Session	Personal	Fictional
<b>Total Words (Tokens)</b>	1	40	62
	2	98	15
	3	24	28
	4	22	25
	<b>Total</b>	<b>184</b>	<b>130</b>
<b>Different Words (Types)</b>	1	17	21
	2	40	11
	3	15	17
	4	12	15
	<b>Total</b>	<b>84</b>	<b>64</b>
<b>TTR</b>	1	0.43	0.34
	2	0.41	0.73
	3	0.63	0.61
	4	0.55	0.6
	<b>Total</b>	<b>0.46</b>	<b>0.49</b>

Frequency of word use and TTR for Participant O by narrative condition across all data collection sessions

	Session	Personal	Fictional
<b>Content Words</b>	1	36	61
	2	88	15
	3	24	25
	4	22	23
	<b>Total</b>	<b>170</b>	<b>124</b>
<b>Function Words</b>	1	4	1
	2	10	0
	3	0	3
	4	0	2
	<b>Total</b>	<b>14</b>	<b>6</b>

Frequency of content and function word use for Participant O by narrative condition across all data collection sessions

# Appendix C15

## Participant O – Communicative Modality

Communicative Modality	Session																																
	1						2						3						4														
	Personal AS	Personal NS	Fictional AS	Fictional NS	Personal AS	Personal NS	Fictional AS	Fictional NS	Personal AS	Personal NS	Fictional AS	Fictional NS	Personal AS	Personal NS	Fictional AS	Fictional NS	Personal AS	Personal NS	Fictional AS	Fictional NS													
Speech	1	12	1	18	1	23	1	8	0	0	7	1	9	0	10	2	9	33	45	59	72	61	85	29	30	19	26	27	35	25	29	23	30
Vocal Gesture	3	1	2	1	3	3	0	0	0	0	0	0	0	0	1	0	0	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Co-Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
AAC-Encoding	4	0	3	0	3	0	1	0	1	0	0	2	0	2	0	1	1	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
AAC-Output	0	0	3	0	5	0	2	0	3	0	2	0	2	0	2	0	0	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Eye Gaze - Person	6	17	4	13	17	33	2	5	0	2	2	1	2	3	4	2	3	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Eye Gaze - Device	15	6	12	4	25	9	4	0	12	1	12	8	7	14	8	7	6	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Eye Gaze - Other	1	0	20	18	3	2	12	13	1	2	2	10	9	1	5	8	8	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Facial & Body Gesture	3	5	3	10	2	11	1	2	0	2	2	0	1	0	0	2	1	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Sign	0	3	0	1	0	4	0	1	0	1	1	0	2	0	1	0	0	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Env. Reference	0	1	10	7	2	0	4	1	0	0	0	3	5	0	1	0	1	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
Neutral	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	1	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
NPC	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29
<b>Total Coded Instances</b>	33	45	59	72	61	85	29	30	19	26	27	35	25	29	23	30	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29	
<b>Total Communicative Acts</b>	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29	33	45	58	72	61	85	29	30	17	26	27	35	23	29	23	29	

Frequency of Communicative Modality use for each data collection session according to narrative type

## Appendix D1

### Data Collection Session Outcomes

Date	Outcome
Jan 4th - 16th	Schools shut due to snow
Jan 21st	First visit met participant & Teaching Assistant -Participant not eligible
Jan 29th	Pilot cancelled - Technical Issues with participant's AAC device
Feb 3rd	Meeting cancelled - traffic & ice
Feb 4th	Pilot with participant - Neither video camera worked – technical
Feb 10th	Pilot Cancelled - Participant Illness
Feb 22nd	Meeting with parents Successful
Feb 25th	Pilot Completed - Participant not using normal AAC
March 8th	First visit met participant and TA
March 10th	Data Collection cancelled - Technical issues with participant's AAC device
March 17th	Data Collection cancelled - Technical issues with participant's AAC device
April 20th	Data Collection successful
April 21st	Meeting with teachers - Successful
April 23rd	Data Collection cancelled - Technical issues with participant's AAC device
April 27th	Data Collection successful
June 14th	Meeting with teacher - Successful
June 28th	Data Collection cancelled - Technical issues with participant's AAC device
July 2nd	Data Collection successful
July 5th	Data Collection successful
July 6th	Data collection cancelled - OFSTED
July 9th	Data Collection successful
July 12th	Data Collection successful
July 14th	Data Collection successful
July 15th	Data Collection successful
July 16th	Data Collection successful
July 19th	Data Collection successful
October 12th	Data Collection successful
October 13th	Data collection cancelled - Researcher illness
October 14th	Data collection cancelled - Participant illness
October 19th	Data Collection successful
October 20th	Data collection cancelled - Technical issues with participant's AAC device
October 21st	Data Collection successful
October 22nd	Data Collection successful
October 22nd	Data collection cancelled - Technical issues
November 3rd	Data Collection successful
November 5th	Data collection cancelled - Participant illness
November 10th	Data collection cancelled - Participant illness
January 27th	Data Collection successful - only fictional
February 4th	Data collection cancelled - Participant illness
February 9th	Data collection cancelled - Participant illness
February 16 <sup>th</sup>	Data collection cancelled - Participant device access issues
<b>% Sessions</b>	<b>43.90 %</b>



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**Cancelled**

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<b>Reason for cancellation</b>	<b>% of sessions cancelled</b>
Technical Fault with AAC Device	44.44
Participant Illness	33.33
Researcher Illness	5.56
OFSTED Inspection	5.56
Snow/traffic	5.56
No access to AAC device (e.g. left at home)	5.56

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# Appendix E.1

## Dissemination of Research

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### Conference Presentations:

#### **Communication Matters Symposium, 2009**

The Multi-Modal Nature of Communication Between Natural Speakers and Aided Speakers: A pilot study

#### **Communication Matters Symposium, 2010**

Telling Stories: A pilot study investigating the key features of AAC users' narrative interaction

#### **ISAAC: Communicating Worlds, 2010**

Poster presentation: The 'Telling Stories' Project Pilot Study

#### **Communication Matters Symposium, 2011**

Telling Stories Project: The Final Chapter

### Journal Articles:

BAILEY, P. & BUNNING, K. 2009. The multi-modal nature of communication between natural speakers and aided speakers. *Communication Matters*, 23, 33-36.

BAILEY, P. & BUNNING, K. 2011. Narrative construction by an aided speaker: a pilot study. *Journal of Assistive Technologies*, 5, 199-213

## Table of Abbreviations

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<b>Term</b>	<b>Abbreviation</b>
Augmentative and Alternative Communication	AAC
Milieu Person Technology Model	MPT
Context, Activities, Technology Model	CAT
Special Educational Needs and Disabilities	SEND
Typically Developing	TD
Initiation, Response, Feedback Framework	IRF
Autistic Spectrum Condition	ASC
Cerebral Palsy	CP
Natural Speaker	NS
Aided Speaker	AS
Speech and Language Therapist	SLT
Research Question	RQ
Personal Narrative	PN
Fictional Narrative	FN

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## Coding Abbreviations

Communicative Modality	Code
Speech	Sp
Vocal Gesture	V
Co-Action	Ca
AAC-Encoding	AACE
AAC-Output	AACO
Eye Gaze:	
Eye Gaze Person	EP
Eye Gaze Device	ED
Eye Gaze Object	EO
Facial and Body Gesture	G
Sign	S
Environmental Reference	Env
Not Possible to Code	NPC
Neutral	N

Linguistic Move-type	Code
<b>Preparation</b>	
Ready	R
<b>Initiation</b>	
Instruct	I
Explain	Ex
Inform	In
Check	C
Align	AI
Query-YN	QYN
Query-W	QW
Query-Choice	QCH
Query-Completion	QC
Request for help	RH
<b>Response</b>	
Acknowledge	A
Object	O
Reply-Y	RY
Reply-N	RN
Reply-W	RW
Response to instruction	RI
Reply-Choice	RCH
Reply-Completion	RC
Clarify	CI
Praise	Pr
Comment	Co
Summarise	S
<b>No Communicative Function</b>	
Operation of device-Other	OD
Repetition	Rep

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