

Organizational patterns of interaction between children with severe speech and physical impairment and their everyday communication partners

Ph. D. Dissertation

Department of Language and Communication,
University of Southern Denmark

Maja Sigurd Pilesjö



UNIVERSITY OF SOUTHERN DENMARK

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List of papers

This thesis is based on the following papers.

1. Sigurd Pilesjö, M. and Rasmussen, G. (2011). Exploring interaction between a non-speaking boy using aided augmentative and alternative communication and his every-day communication partners: features of turn organization and turn design *Journal of Interactional Research in Communication Disorders*, 2(2), 183-213. Reprinted from permission by © Equinox Publishing Ltd [2011].
2. Sigurd Pilesjö, M. (forthcoming). On the use of bodily action and vocalizations as resources and methods when claiming and completing turns in aided interaction. In Christina Samuelsson, Niklas Norén, Charlotta Plejert (Eds.). *Aided Communication in Dialogical Perspectives. Augmentative and Alternative Communication as Action and Participation within Embodied Social Worlds*. Surrey, UK: J&R Press Ltd. Manuscript accepted for publication.
3. Sigurd Pilesjö, M. (forthcoming). Creating meaning through the coordination of gaze direction and arm/hand movement. Manuscript submitted.

This volume is a revised version of the dissertation publicly defended July 11, 2012 for the Degree of Doctor of Philosophy.

English summary

In this thesis interaction between children with severe speech and physical impairments (SSPI) and their everyday communication partners has been explored. The aim was to investigate how the participants accomplish shared understanding. Naturally occurring data in everyday settings were video recorded. The data have been collected, transcribed, and analyzed according to the principles and practices of conversation analysis. The thesis consists of three papers. The first two papers investigate turns that are constructed with the use of a Blissymbolics communication board in interaction between one boy and his everyday communication partners. The third paper investigates turns with the use of natural modes (bodily action) and vocalizations, in interaction between a girl and her everyday communication partners.

In paper (1) the organization of turns using the Blissymbolics communication board and their design was explored. The turns were co-constructed in a way that the child with SSPI points at a bliss symbol and the speaking co-participant voices and thereby constructs a turn constructional unit (TCU), the turn is called a TCU-based turn. The turns were commonly constructed in a pattern of a pre-beginning (achieving mutual orientation) followed by a TCU-based turn. The TCU-based turn is commonly completed with a post-completion.

The resources and methods that were applied as turn pre-beginnings and post-completions were explored in paper (2). Gaze direction was found to be one widely applied resource in pre-beginnings. Other resources were smiles, vocalizations, and arm movements. In post-completions gaze direction and smiles were deployed. The pre-beginnings and post-completions seem crucial to turn transition, as means to claim and complete a turn and to make turn-taking possible.

In paper (3) data from interaction between a girl with SSPI and moderate intellectual disability and her everyday communication partners were analyzed. A practice of creating meaning through the use of bodily action and vocalizations was demonstrated. This method consisted of the girl coordinating gaze direction and arm/hand movement towards a particular object. The speaking communication partner attributed meaning to the turn (and action for interaction) in the specific context. The ascribed meaning was 'wants' and a deictic function.

Different organizational patterns were found in the data. The patterns were systematic, recurrent, and, thus, recognizable to the participants. It is

apparent that the participants organize their interaction in turns although they differ from turns in ordinary interaction – turns-at-talk. They differ in that the participants exploit multiple other resources to a higher degree, instead of using talk as a resource to construct turns and to manage turn-taking. Furthermore, the speaking partner commonly takes on a more extended role than in ordinary interaction as he or she, among other jobs, co-constructs the turn. The interaction is thus characterized by a great deal of overt collaborative work. Multimodality, artifacts, and the sequential context also play a different role than in ordinary interaction in that it is organized differently.

Danish summary

I denne afhandling er interaktion imellem børn med omfattende tale- og fysiske handicaps (severe speech and physical impairment, SSPI) og deres daglige kommunikationspartnere blevet undersøgt. Formålet var at undersøge, hvordan deltagerne opnår fælles forståelse. Naturligt forekommende samtaler i dagligdags sammenhænge blev videooptaget. Data er indsamlet, transskriberet og analyseret i henhold til principper og praksisser inden for konversationsanalyse (conversation analysis). Afhandlingen består af tre artikler. De første to undersøger ture, der er konstrueret ved hjælp af Bliss-symboler på en pege-tavle. Disse ture beskrives for interaktioner imellem en dreng og hans daglige kommunikationspartnere. Den tredje artikel undersøger ture, hvor der gøres brug af naturlige modaliteter (kropsbevægelser) og vokaliseringer. Disse ture beskrives for interaktioner imellem en pige og hendes daglige kommunikationspartnere.

I artikel (1) undersøges både organiseringen af ture, hvor samtalepartnere benytter Bliss symboler på en pege-tavle, og selve designet af disse ture. Turene var ko-konstruerede på en sådan måde, at barnet med SSPI peger på et Bliss-symbol, og den talende deltager lægger stemme til (voicing), hvorved der konstrueres en turkonstruktionsenhed (turn constructional unit, TCU) - turen benævnes følgelig en TCU-baseret tur. Turene konstrueredes i fællesskab i et mønster bestående af en præ-begyndelse (hvorved der opnås gensidig opmærksomhed) efterfulgt af en TCU-baseret tur. Den TCU-baserede tur afsluttes ofte med en såkaldt post-mulig-afslutning, en blik.

Resurserne og metoderne, der anvendtes som tur-præ-begyndelse og post-mulig-afslutninger, blev nærmere undersøgt i artikel (2). Blikretning var den mest hyppigt anvendte resurse. Andre resurser var smil, vokaliseringer og

armbevægelser. I post-mulig-afslutningerne blev blikretning og smil anvendt. Både præ-begyndelser og post-mulig-afslutninger virker til at være essentielle ift. turskifte som metoder til at opnå og afslutte en tur og til at gøre turtagning mulig.

I artikel (3) analyseres data fra interaktion mellem en pige med SSPI og moderat udviklingshæmning og hendes daglige kommunikationspartnere. En praksis med meningsskabelse ved hjælp af kropsbevægelser og vokaliseringer blev påvist. Denne metode bestod af pigens koordinerede blikretning og arm-/håndbevægelser mod et bestemt objekt. Den talende kommunikationspartner tilskrev mening til hele handlingen i den specifikke kontekst. Den tilskrevne mening var 'vil have' og en deiktisk funktion.

Forskellige organisatoriske mønstre blev fundet i data. Disse mønstre var systematiske, tilbagevendende og derfor genkendelige for deltagerne. Det er åbenlyst, at deltagerne organiserer deres interaktion i ture, omend disse afviger fra ture i almindelig ansigt-til-ansigt interaktion, nemlig tale-ture. De afviger i den forstand, at deltagerne udnytter multiple andre tilrådestående resurser i højere grad, i stedet for at bruge talesprog til at konstruere ture og til at organisere tur-tagning. Endvidere tager den talende partner ofte en udvidet rolle i interaktionen, idet vedkommende – udover andre opgaver – ko-konstruerer interaktionspartnerens ture. Interaktionen er således karakteriseret ved et ikke uvæsentligt, åbenlyst samarbejde. Multimodalitet, materielle objekter i omgivelserne og den sekventielle kontekst spiller også en anderledes rolle end i almindelig interaktion, idet interaktionen er organiseret anderledes.

KEYWORDS: interaction, severe speech and physical impairment, augmentative and alternative communication (AAC), Blissymbolics, bodily action and vocalizations, Conversation Analysis.

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1 INTRODUCTION

For some persons, although the needs to communicate are the same as for everyone, communication may be challenged by impairments. In some cases the impairments are so severe that the person cannot speak. These individuals need and use other resources for interaction. Augmentative and alternative communication (henceforth called AAC) is a term that is used for communication with means other than speech or in addition to speech. This kind of interaction is the focus of the present work.

Whenever people come together, interaction and mutual understanding emerge, irrespective of what resources are available to the interactants. This is true for ordinarily speaking people; for parents and infants; and it is also true for persons with challenged capabilities of some kind, as for instance, persons with severe speech and physical impairments and their everyday communication partners.

The purpose of the present work is to study the process of sense-making in these circumstances. The aim of the thesis is to uncover and describe how the interactants build up and organize interaction, creating shared understanding when using the resources that are available. The focus of the present work is on what I consider being some of the fundamental elements of interaction; turn organization and turn design, bodily action and vocalizations as resources and methods deployed in turn transition, and as resources and methods that are employed by the participants to create meaning. In doing that, a specific scientific approach called conversation analysis (CA) will be used. CA primarily deals with how people in talk-in-interaction collaboratively accomplish actions and social life, manifested in sequences of talk. Furthermore, CA deals with how turns and turn-taking are built up. Therefore, CA seems to be a relevant framework (and methodology, see section 2.3 below) when studying fundamental interactional phenomena such as turns and turn-taking, irrespective of the resources the participants make use of to accomplish their actions and interactions. The present work deals with the following questions: Do the individuals engaged in AAC organize their interaction in turns and turn-taking? If so, how are the turns designed? What resources and methods are employed in achieving turns and turn-taking? This thesis is actually about looking at very fundamental, subtle and vernacular things. Although these phenomena have a great impact on the interactional process, they are not very much investigated in the research and clinical field of AAC. Moreover, the everyday communication partners and the professionals that

support persons with communication impairments are commonly not aware of how the interaction is actually accomplished (Higginbotham, 1985). The present work aims at contributing knowledge to these phenomena.

The participants engaged in AAC in this thesis are children who have severe speech and physical impairment, SSPI (the term ‘impairment’ refers to problems in body function or structure) (WHO, 2011). They are, due to cerebral palsy, unable to speak and unable to move their bodies in an ordinary manner. In addition, one child has an intellectual disability. (The term ‘disability’ is an umbrella term for impairment, activity limitation and participation restrictions, WHO, 2011). The thesis is an investigation of interaction between the children and their everyday communication partners in different everyday settings. The everyday communication partners are a mother, an assistant, a grandmother and a special education teacher. Research on interaction with everyday partners and the person with communication impairment has until now been minimally investigated in the field of AAC (Light & Drager, 2007) but the field has grown recently (Ferm, 2006; von Tetzchner & Hygum Jensen, 1996). Especially studies with a microanalytic and dialogic approach, using the methodology of CA, are rare (Clarke, 2005; Higginbotham, Mathy- Laikko & Yoder, 1988). In contrast to the traditional approach in speech and language pathology, this thesis focuses on the process of AAC from a conversation analytic perspective. Thus, it takes a micro-analytic view and scrutinizes how the participants organize and structure their everyday interaction to accomplish shared understanding (Schegloff, 2003). This approach is not traditionally taken. Thus, it may result in a thesis that is unconventional to both fields.

Using CA as a methodology, the thesis finds that AAC interactions are organized and distributed differently than in ordinary interaction. Still, the interaction is organized in a systematic, recurrent, and recognizable way such that ordered patterns of interaction emerge that are oriented to by the interacting participants.

1.1 Basic points of departure after many years of clinical experience

There are a few stand points underlying the thesis that have to do with my 25 years of clinical experience as a speech and language therapist.

First of all, I learned by clinical experience that I as a communication partner can influence the ongoing interaction with my own actions. An example is when I interact with a person that is unable to speak who has a communication board. I can say - what are you thinking about - while orienting to the

communication board. It is fairly probable that the non-speaking person will respond by pointing at something on the communication board. If, on the other hand, I say – did you go to the beach yesterday – it is not likely that s/he will respond by using the communication board but by indicating yes or no with a body movement. In this manner I can influence the contributions of my co-interactant, I can also influence if the communication board is used or not. Hence, you could say that, over time, my experiences as a clinician developed a kind of *sequential awareness*. This awareness was something that I started to use as a resource in intervention. My experience told me that because a turn is always influenced by the previous turn, it is only meaningful to look at interaction in sequences of turns and not at turns in isolation. Recently, this is supported by research in the field of AAC which recommends studying interactions including both parties in interaction (Blackstone, Williams & Wilkins, 2007) and it is definitely supported by the findings in this thesis.

A second point of departure comes from reading many studies in the field of AAC. So far, a great deal of the research in the field of AAC has been undertaken in experimental prearranged settings often with typically developing individuals (for a résumé of typical studies in the field see Light & Drager 2007). The setting is decided in advance by the researcher. There is a problem with these studies in my opinion. Language and other resources are used in interaction in the real world. In order to say something about how it works, you need knowledge about how it functions in the real world. Thus, it is questionable how useful the results from these studies are. Therefore it is essential to know how interaction actually works in the local ongoing interaction in the everyday mundane and familiar setting. It is therefore crucial to collect data from *naturally occurring* spontaneous interaction. This approach to studying interaction is strongly supported by the CA methodology (see section 2.3 below).

Thirdly, in the field of AAC there is a lack of studies on what is actually taking place in everyday interaction (Clarke, 2005; Ferm, 2006). Interaction seems to be looked upon in a too simplistic manner, often observing one resource/modality at a time with a hypothesis or predefined categories. It is a complex process and there is a need to find out more about it (Ferm, 2006). The founder of CA, Sacks (1984b) himself put it as follows: ‘...the world you live in is much more finely organized than you could imagine.’ (Sacks 1984b:414). The picture seemed much more complex than I thought from the beginning of my career as a speech and language therapist. As a clinician I then started to notice that so much more than, for instance, pointing at symbols on a communication aid was going on when participating in this kind

of AAC interaction. Many more resources than the communication board seemed to be at play when constructing sense-making actions. However, not much research has been done looking into the details of AAC interaction (Higginbotham, 1985). You can find many people working in the area of AAC with different views on interaction, but do their ideas really correspond with real life interaction? How do we construct intervention programs if we do not know what resources are at play and how they figure together in the construction of actions and turns? How do we then know what we are heading for? In this vein, it seems crucial to investigate *all resources* used at the same time in an inductive manner. For this reason, the focus of the thesis is on all resources that are employed.

A fourth standpoint is the need to study challenged interaction *in its own right* and not as a comparison to typical interaction which then reduces it into a deviant kind of interaction (Kraat, 1985; von Tetzchner, Grove, Loncke, Barnett, Woll & Clibbens, 1996). My experience told me that interaction was going on, although with other resources and methods than in ordinary interaction. Although, several features are of course, the same, for example, the communicative goals. However, the organization of interaction is probably built up differently and its true nature needs to be investigated (Ferm, 2006; Higginbotham, 1985).

A fifth point is that in the field of AAC the research tradition is to do quantitative research. Due to the fact that the population of AAC is heterogeneous (Blackstone, Williams & Wilkins, 2007; Pennington, Marshall & Goldbart, 2007) the results do not often tell you much about any action or interaction accomplished by any person (Higginbotham, 1985). Thus, when reading other studies I had difficulties adapting the results to the individuals I met in my clinical everyday work.

A final standpoint is the need to investigate interaction where it really is taking place and with people who usually participate in the interaction (Schegloff, 2003). A child spends most of the time at home, mostly with people the child meets every day and knows well. Children also spend time at the day care centre, at school etc. Therefore, information about everyday interaction is most relevant (Ferm, 2006). Your mother, father, grandmother, grandfather, siblings, friends, and personal assistant are examples of everyday communication partners. In the field of AAC studies of interaction with everyday communication partners in everyday settings in their home environment are lacking (Ferm, 2006; Thunberg, 2007). For that reason, interaction is studied at home and at school in the present study.

Due to my experiences as mentioned above, I was immediately tempted to employ CA as a research method in my project when I first heard about it. CA seemed to be the logical choice of research method. I have for my entire education and working life been 'embedded' in the cognitive psychology paradigm (Potter & Edwards, in press) but succeedingly realized that matters can be looked upon in a different way. CA definitely differs in dramatic ways from cognitive approaches. It challenges these approaches in different ways (Potter & Edwards, in press) and it definitely has challenged me in many respects. This thesis testifies to the insights that I gained from the CA approach.

1.2 Aim and research questions

The aim of this study is to describe how interaction is built up and managed in everyday life in interaction where at least one partner has a severe speech and motor impairment. To pursue the aim, the research questions are as follows.

How do the participants organize their interaction and thereby achieve a common/mutual understanding?

More specifically, the questions are:

1. Do the participants organize the interaction in turns and turn-taking?
2. If so, how are the turns designed and organized?
3. What resources and methods are employed to construct turns?
4. What kind of actions and activities do the participants construct?
How do they accomplish that?
5. In what terms can we describe these processes?

Paper (1) deals with question 1, 2 and 5. Paper (2) focuses on question 2, 3 and 5. Paper (3) investigates question 2, 3, and 4.

2 THEORETICAL PART

This thesis shows influences from several fields, theories and methods; the field of Augmentative and Alternative Communication (AAC) (highly interdisciplinary in itself), conversation analysis (CA) and my own clinical experience as a speech and language therapist. The central concepts, fields, assumptions, and findings will be briefly described in this chapter. A person who is accustomed to reading works conducted in CA will find that the presentation of this work differs somewhat from traditional CA studies. It is due to the fact that the thesis blends the field of AAC and the field of CA. Thus, background information is given in a wider degree. However, the analyses are not influenced by this fact. They are conducted in an 'unmotivated' manner.

2.1 Interaction and Communication

As mentioned above, the present study is done within the research field of Augmentative and Alternative Communication (AAC). It deals with communication and interaction in special circumstances. One may wonder about these different categories. Are they different or not? And, are they interrelated? There exist many definitions of 'communication' (see section 2.1.1, for a brief discussion). However, in CA 'communication' is described in terms of interaction. CA holds that mutual understanding is achieved through actions accomplished by people. Interaction is overwhelmingly done through language (Francis & Hester, 2004) but can also include activities as, for instance, ping-pong, dancing, and card games (Sacks, Schegloff & Jefferson, 1974). In accordance with this, the definition of interaction used in the present thesis is:

Social interaction is 'any situation in which a person produces an action addressed or directed towards another/or which invites or makes possible a response from another'

(Francis & Hester, 2004:3)

Interaction is commonly considered being a wider concept than 'communication'. Communication is here defined as a social process between humans that occurs when the participants ascribe meaning and respond to each others conduct (Linell, 2009). Communication is a dynamic process where the participants employ multiple modalities and methods in order to jointly establish an understanding that is sufficient for 'current, practical purposes' (Garfinkel, 1967:39). However, this definition of 'communication' is a part of the CA

understanding and definition of how sense is made in interaction.

As mentioned above, CA is not primarily interested in language but in language as a way of organizing social life (Heritage, 1984a). The CA focus is on how organization of interaction is done and what methods are deployed to accomplish different social actions. Furthermore, the focus is on how social conduct is treated as a recognizable sense making process and, thus, understandable action by the participants, an action that influences the development of the interaction. Thus, in CA literature the terms interaction and communication are commonly employed interchangeably. So they are in this thesis and for good reasons. Frequently, the participants in the described AAC interaction organized their social conduct such that it was constituted solely by actual bodily actions of some kind. These bodily actions were treated as sense-making actions for interaction or communicative actions as it were. These were then oriented to as turns.

2.1.1 Terminology considerations

It is difficult to categorize human communication. Subsequently it is hard to find labels that are distinct and useful. The discussion below is a proof of just that. Depending on what field you come from, different terms are used. Different fields have the need for different limitations. Thus, in interdisciplinary work, as the present study, you come across many terms. Sometimes the terms are used interchangeably and sometimes they are used in overlap. Below follow a few considerations regarding the terminology that are relevant for the present study.

Firstly, a few words about modes of communication. Article (2) investigates resources that are used together with the indications on the Blissymbolics communication board in turn transition, when claiming and yielding a turn. Article (3) explores the coordination of different resources in creating meaning. These are e.g. vocalizations (vowels in varying pitch, intensity and duration, occasionally together with a consonant), gaze direction, facial expression, head movement, arm/hand movement and other visible bodily action. Regarding bodily action, the field of CA commonly employs terms such as visible bodily action, non-verbal action, embodied action, body movement, multimodal action, and visual action for all interactionally relevant resources used by a person that are not spoken and audible. I have chosen to use the terms **(visible) bodily action and body movement** as a general term. Thus the terms 'bodily action' or 'body movement', and vocalizations are employed. A related notion that is common within cognitivist approaches embodied ac-

tion is 'gesture'. This notion has also been used within interactional studies (Streek, 2009), but seem to be restricted to certain conventional communicative bodily action with the hands only, thereby excluding a range of other kind of embodied action. In order to avoid this restriction, 'gesture' will not be used in this study, despite that some of the hand movements observed in the data might overlap with interactional studies of hand gestures. An obvious exception is of course when referring to previous research.

In the research field of AAC visible bodily action and vocalizations are commonly labelled natural AAC modes (see section 2.2.4, for further information on AAC modes) but since readers from the CA community are not accustomed to that term I have chosen to use the terms bodily action and vocalizations. Noteworthy is that bodily action does not include indications on the Blissymbolics communication board although they, of course, can be labelled as bodily action.

The term non-verbal communication has previously been employed in both the field of AAC and CA. This term will not be used in the present thesis due to the fact that it is widely acknowledged as a superficial separation (Streck, Goodwin & Lebaron, 2011) because it is difficult to draw a line between what is verbal and what is non-verbal. That becomes salient when you observe data of the kind that are studied in the present thesis. The term non-verbal will only be used when referring to other studies where the term is used. This is done in order not to change the intended meaning.

Secondly, I want to mention terms used when referring to the children. When referring to the boy in article (1), the term 'non-speaking boy' is used. The term 'non-speaking' refers to people with such severe speech and physical impairment that they are unable to speak. Instead, in article (2) and (3), the term 'child with severe speech and physical impairment', SSPI, is employed in order to be congruent with recent research in the field of disability but also because the term states what physical problem the person has. The change of term reflects my raised awareness of terminology. By using the term children **with SSPI**, the individuals with impairment and/or disability are first and foremost looked upon as individuals and not as 'disabled persons'. However, the term 'non-speaking' still occurs in presentations of others' research.

Another term, used in the field of AAC, referring to people who use AAC modes, is 'persons with complex communication needs' meaning the persons with severe speech impairment. All people's communicative needs can be simple or complex (Ferm, 2006). Therefore, I consider it a vague term that I have chosen not to employ.

Article (3) focuses on interaction between a girl with severe speech and physical impairments (SSPI) and a moderate intellectual disability. The term intellectual disability is chosen in order to be congruent with recent research in the field. In previous research the term multiple disability is sometimes employed. When referring to previous research I have not changed the term employed in the studies. When referring to the impairments of the girl, in article (3), I have chosen to use the term SSPI and moderate intellectual disability.

Furthermore, one can question the term severe speech and physical impairment (SSPI) and ask if speech is not also physical. Of course it is. However, the term severe speech and physical impairment is frequently used in the literature of disability and AAC. Therefore, it is employed in the present work.

Regarding analytical terminology, in article (1) the term TCU-based turn and TCU-based unit are suggested when referring to turns that are built up using the communication board that are followed by a voicing act of the speaking co-participant. Turns that are organized using the communication board without the following voicing are called non TCU-based turns. These terms were used to distinguish between turns organized in a pattern of symbol pointings followed by voicing and symbol pointings that were not followed by voicing. In article (2) the term communication board-mediated turn is used as a general term for turns organized with the use of a communication board (It will henceforth be called CB-mediated turns). In article (2) the focus is not on whether the turns are voiced (TCU-based) or not (non TCU-based turns). In addition, article (2) is part of a book in AAC and the target group of this book is people who are not accustomed to CA terminology. In that context, the term TCU-based turn may need extensive explications and the focus of the article could be lost. The use of the term CB-mediated turn is congruent with Clarke and Wilkinson's (2007, 2008) use of the term VOCA-mediated turn which refers to turns produced with a VOCA (voice output communication aid).

Finally, a word on the term used for the interaction as a whole. The term ordinary interaction is used in the thesis. It differs from the traditional use of the term in CA studies (Drew, 2005; Heritage, 2005) in that it refers to interaction with people who speak in an ordinary manner, in which the participants use 'mouth-speech' in combination with other resources, for communication. It does not specifically refer to casual, non-institutional conversation (as opposed to institutional conversation) as is commonly meant when the term is used in CA.

As opposed to ordinary interaction, the thesis focuses on interaction where the capacities for interaction are challenged by impairment. The term challenged interaction is employed when referring to interaction that is challenged by lack of capacities of the participants in general. Aided AAC, communication board-mediated interaction and aided interaction are used when referring to interaction using communication aids. The whole process of interaction, regardless if communication aids are used or not, is called AAC or the process of AAC.

The term AAC is a term that has been used with several meanings, commonly for the AAC modes or aids employed but also for the field of AAC and the interactional process. In an attempt to be clear I have chosen to use the term AAC modes and aids when the communication aids and modes for AAC are referred to. The person with severe speech and physical impairment engaged in the process of AAC is referred to as a person with SSPI, as the person using AAC modes or the user of AAC aids or modes.

In sum, during the developing Ph.D. process, I have become aware of that there are many terms in use in the present thesis. It may be the result of trying to blend the field of AAC and CA and may also reflect my raised awareness of terms. Hopefully, the terms are described and illustrated in such a manner that they are understood by the reader.

2.2 The clinical and research field of Augmentative and Alternative Communication

As mentioned above, the thesis is conducted in the research field of AAC. This is a rather new field, both in clinical practice and research. Augmentative and alternative modes began to be systematically applied in Europe in the late sixties (von Tetzchner & Hygum Jensen, 1996). It is clearly an interdisciplinary field, relating to e.g., speech- and language pathology, special education, occupational therapy, linguistics, psychology, cognitive science, and engineering. The field is also rather small, consisting of few clinicians and even fewer researchers. It is primarily an applied field, where research on fundamental phenomena frequently is not prioritized (Higginbotham, 2000). The focus is instead commonly on the communication aids and symbols (Clarke, 2005).

2.2.1 Defining Augmentative and Alternative Communication

The present thesis is done in the field of AAC and therefore a definition of AAC is needed. A definition serves several purposes. It can demonstrate what paradigm the user adheres to and the specific interests of this paradigm. In ad-

dition, the definition influences what research questions you ask, which methodology is used, and how the results are interpreted (Blackstone et al., 2007; Higginbotham, 2000). Furthermore, the definition may have practical and clinical consequences due to the fact that it can include or exclude people from legal services such as intervention (Olsson, 2006). An example of the latter is when the definition solely encompasses 'intentional' action as communicative behaviour (Lloyd, Quist & Windsor, 1990; Olsson, 2006). In that case persons with severe intellectual disability may be excluded from intervention.

In the field of AAC there are several definitions of AAC in use. Some refer mainly to the non-speech modes employed (e.g. Beukelman & Mirenda, 2005; von Tetzchner & Hygum Jensen, 1996). The American Speech-Language-Hearing Association, ASHA (2011), for example, defines AAC as 'all forms of communication (other than oral speech) that are used to express thoughts, needs, wants, and ideas.' (American Speech-Hearing-Language Association, ASHA, 2011). A few researchers also include the methods employed (e.g. Clarke, 2005; Ferm, 2006). Some scholars refer to the whole area of research, clinical and educational practice and modes (Beukelman & Mirenda, 2005). Natural modes can be excluded (e.g. Lloyd, Quist & Windsor, 1990) but are nowadays commonly included (Beukelman & Mirenda, 2005). Lloyd, Quist and Windsor (1990) focused on the communicative process when they defined AAC as the process of social interaction which involves the transmission of meaning from one communication partner to another, where at least one partner uses visual, tactile, or auditory systems to augment or replace speech and/or writing and is intentional, symbol-based and rule-governed.

The fact that AAC encompasses communication makes a definition of communication essential (see section 2.1). Despite the heterogeneity of the definitions of AAC, one can observe that the definitions of communication in the field are now commonly developing from the sender-receiver (Shannon & Weaver, 1949) model to viewing communication as a joint action between individuals aiming at collaborately establishing meaning (Blackstone, et al., 2007; Higginbotham, Shane, Russell & Caves, 2007; von Tetzchner & Grove, 2003).

The definition of AAC employed in the present work does not deal with whether the action is intentional or not, as long as it functions as a communicative act, that is, is responded to by the communication partner and makes a contribution to the ongoing interaction. (Regarding the concept of Intention, see section 2.2.6.1) Thus, the definition of AAC used here encompasses the 'attribution of meaning' by the communication partner. This is not common

in the field of AAC but occurs in, for example, the definitions by Grove, Bunning, Porter, and Olsson (1999), Granlund and Olsson (1999) and, Olsson (2006). The definition used in the present work also includes all modalities, natural modes as well as formal modes of AAC, and regards the process as dynamic, constantly changing, and not fixed.

Thus, the following definition is used:

Augmentative and Alternative Communication (AAC) is the social communicative process that occurs between interactants where at least one of the participants has a severe speech impairment. In this process the participants ascribe meaning and respond to each others conduct. It is a dynamic interactional process where the participants employ multiple modalities and methods in order to jointly establish a shared meaning that is sufficient for current purposes.

2.2.2 Communication Models in AAC

This study is not derived from a specific theoretical model, although it is conducted within a specific interactionist approach. CA is an inductive research approach, which seeks to understand how shared understanding is built up and manifested in the structure of interaction. The findings lead to descriptions of the practices and organization of interaction. Theory is based on findings of phenomena that are oriented to by the participants in naturally occurring interaction. Therefore, deductive theoretical models are generally avoided in CA.

Thus, the position taken here is that empirical findings should constitute the basis of a theoretical model. Theory should be developed from findings and not vice versa. Thus, the findings of the present work may contribute to theoretical issues of AAC. Hence, in spite of the traditional sceptic view on theoretical models in CA, I will describe, in a few words, issues discussed when presenting a model of AAC and a few models or aspects of models of AAC that have been presented during the years.

Researchers and theorists in AAC find that theoretical models are lacking in the field of AAC (Lloyd et al., 1990; von Tetzchner & Hygum Jensen, 1996). One issue that has been discussed is whether to develop a separate model of AAC or to fit AAC into a model of ordinary communication (von Tetzchner & Hygum Jensen, 1996). There are considered to be advantages of both views. On the one hand, it is likely that an AAC model can include typical interaction and maybe broaden the scope of the general model. In addition, you can easily observe that in AAC, many similar features of general

communication are involved. However, an AAC model needs to emphasize features which may not play a wide role in ordinary interaction. Additionally, it is important to acknowledge that AAC interaction does not have the same available resources as ordinary interaction has (Kraat, 1985; von Tetzchner & Hygum Jensen, 1996). Thus, it is not certain that the model of ordinary interaction takes into account important features of AAC interaction. In a general model, then, AAC interaction would be considered deviant. Several researchers argue that it is of import to study the true nature of AAC interaction, to study AAC in its own right (Kraat, 1985, von Tetzchner & Hygum Jensen, 1996) and therefore develop a separate model for AAC. Using CA as a method, one may find that the participants involved in the process of AAC are scarcely interested in one or the other. However, for professionals there may be a pedagogical advantage not to regard AAC as something completely separate from ordinary interaction and, therefore, it may be essential to develop a model of general communication but with modifications for AAC (Lloyd et al., 1990) as long as it is based on empirical findings. Additionally, similarities (e.g. bodily action in ordinary interaction) can be examined together with AAC in a general model for communication.

One theoretical and deductive model that has had a great impact on AAC research, as well as on research on communication in general, is the information processing (signal-transmission) model proposed by Shannon & Weaver (1949). In short, it considers communication a chain of information transfer, where there is an information source (e.g., the brain) which chooses a message to be communicated. The transmitter (e.g., the vocal system) changes the message into an appropriate signal that is sent over the communication channel (e.g., air) from the transmitter to the receiver. The receiver (e.g., the ear) reconstructs the message from the signal and transfers the message to the destination (other person's brain) (Shannon & Weaver, 1949). Lloyd et al. (1990) drew on this model and further developments of this model in proposing a model for AAC. The major parameters of their model were: sender, message, transmitters, AAC transmission processes, AAC interface, internal feedback, transmission environment, communication environment, receiver, and external feedback (Lloyd et al., 1990). The problems with these models are that they are primarily linear and see communication as a one-way static process. The models mainly focus on the speaker and consider the message and intent as complete and intrinsic in the speaker. The collaborative work that is conducted in interaction is underrated. Additionally, these models do not take into account the sequential context i.e., that every turn or action

relies on what came prior to it and also influences what turn or action that comes after.

Moving away from this model, Tetzchner et al., (1996) presented preliminaries to a model of AAC. These preliminaries take into account more dimensions in communication but still focus on the participants' intrinsic intentions in the message and not on the dynamic process of accomplishing shared understanding in interaction. The authors suggested that a model should consist of four dimensions: physical, cognitive, interactional and socio-cultural aspects. These aspects were interconnected. The interactional aspects were considered to be the basic level of the model. The interactional aspect should scrutinize the communicative functions and the structure of interaction. The focus of this basic level should be on for example, the issue of achieving and maintaining mutual attention, the construction of turns, and the role of bodily action.

Focusing on one of the dimensions discussed by von Tetzchner et al. (1996), the interactional dimension, Higginbotham (2009) described a model that he called the model for Social Interaction Performance. In contrast to the models mentioned above, this model sees interaction as a dynamic process where the participants collaboratively accomplish shared understanding in interaction. Interaction is seen as a coordinated performance by the participants whose main goal is to achieve common ground. Higginbotham (2009) views communication as inter-subjective, with both partners engaging in their role-specific communication activities (e.g. speaker-addressee), actively adapting their communications to meet the perceived needs of their partners. This view emphasizes co-construction, multi-modality, attention, communication roles, and relationships. It takes into account confirmatory yes-constructions, collateral repetitions of the person using an AAC system, use of conversational artifacts, and the use of body-based resources. The model focuses on relevant real-world issues, such as the communication success, or manner in which the communication exchanges were accomplished (Higginbotham, 2009).

Although there is a lack of interest in theoretical models in CA, the specific scientific approach may contribute to the development of the interactional models (e.g. Higginbotham, 2009) through its findings. The findings are valid due to several reasons (see section 3.6), e.g., the participants perspective taken. In the developing interaction the participants demonstrate their understanding to each other's turns (for a description of CA, see section 2.4). This understanding is employed as proof in the analysis. Thus, it is not the analyst's interpretation or coding that governs the analysis. It is the

participants' understanding of the interaction. Moreover, in CA you look at the whole process in detail, thus, all interactionally relevant resources that are used are attempted to be taken into account. These resources are, for instance, the bodily actions of the participants, the sequential context and the artifacts. In addition, the collaborative work is taken into account in the sequential analysis. That the data is naturally occurring also adds validity to the findings and may therefore contribute to the interactional models mentioned above.

2.2.3 Population of persons who use AAC modes

The present study focuses on children who are unable to speak. Thus, they are included in the population of persons who use AAC modes. However, the population of individuals who use AAC modes is heterogeneous (Pennington et al., 2007). Using the World Health Organization's International Classification on Functioning, Disability and Health (WHO, 2001) as a point of departure, it can be illustrated in the following way.

People who use AAC modes vary in their body structure and functions, in their activities and participation and in the environments in which they live and communicate (Pennington et al., 2007). People who use AAC modes can be of different ages from very young to elderly. The disability can be congenital or acquired. The medical diagnoses are diverse. Common medical diagnoses are cerebral palsy, learning/intellectual disabilities, autism or amyotrophic lateral sclerosis (ALS). Body functions that vary are, for example, receptive and expressive language, intellectual functions, speech and voice functions, sensory functions of vision, hearing, and motor abilities.

People who use AAC modes vary in the activities in which they engage and consequently in the types of interactions they engage in. The activity can be work-related, it can have an educational purpose, or it can have a social purpose. The physical and social environments vary. The person can be at home, at school or in a residential setting, for example. The social environment differs regarding whether communication partners facilitate or hinder interaction. Communication partners vary in style and number. Knowledge and experience of AAC differs among communication partners and communication partners may also vary in their attitudes towards the person who uses AAC (Pennington et al., 2007).

2.2.4 Modes of AAC

AAC modes are traditionally categorized in two main categories (Beukelman & Mirenda, 2005), **unaided and aided** AAC. Unaided AAC consists of

modes that do not require a communication aid. Instead, you use your body as a resource. It consists of, e.g., manual signs, vocalizations, gaze, or gesture. The second category consists of aided AAC modes. Aided modes require an external device, a communication aid, to keep and give possible access to the words/symbols. Within the unaided and aided categories **natural and formal** AAC modes are referred to (Heister Trygg & Andersson, 2009). Natural AAC modes are modes that have evolved naturally and are employed by all people but used in a wider degree by persons with severe speech impairment (e.g. gaze, vocalizations, facial expressions, head movement, arm/hand movement and other body movement) (These modes, exclusive of vocalizations, are called (visible) bodily action in article (2) and (3)). Formal AAC modes (Cress, 2009) are construed and adapted solely for people who use AAC modes. Examples of formal AAC modes are objects, manual signs, pictures or Blissymbolics. As well as all people, people using AAC modes are multimodal by nature (see section 2.3.3). However, there are often one or a few main formal AAC modes employed.

In investigating the entire communicative process, as is done in the present work, all modalities are scrutinized, thus the natural modes are included. In article (1), both formal and natural modes are investigated, but the symbol pointings are emphasized in article (1), thus the formal AAC mode. In article (3), formal AAC modes are not employed by the participants. Thus, article (3) scrutinizes the natural AAC modes, i.e., the coordination of gaze direction and arm/hand movement, that are employed by a girl with severe speech and physical impairments in creating meaning. Natural modes, e.g. gaze direction and vocalizations, are also explored in article (2) where the modes are used as resources and methods for turn transition together with the formal AAC mode, Blissymbolics.

As mentioned above, the present study investigates the use of all modalities in the interactional process. The formal mode used by the children in the present data set is Blissymbolics. In article (1) and (2) a Blissymbolics communication board is used. Blissymbolics is outlined shortly below.

2.2.4.1 Blissymbolics

As mentioned, among the formal aided modes there exists one AAC mode called Blissymbols/Blissymbolics (henceforth called Blissymbolics in accordance with Blissymbolics Communication International, BCI, 2009) (McNaughton, 1985). Blissymbolics, originally developed by Charles K. Bliss (1897-1985), is a logographic sign system, that is, a set of written signs that is

not based on the phonetic principle, but on ideas/concepts. This means that the concept/idea, as categorized in words, not letters, becomes the smallest linguistic unit. The Blissymbolic system consists of approximately 4000 Bliss-words that are created out of a number of basic Bliss-characters. The Bliss-words are categorized in iconic, conventional and arbitrary signs. Bliss-characters and Bliss-words may be combined to make new words and sentences. For example, the signs CAR – HOSPITAL can express the word ‘ambulance’. A number of these combinations are conventional, but there may also be several ways of expressing the same word in Blissymbolics. ‘Ambulance’ may also be expressed with the combination of CAR – WHITE – RED, for example. The single signs are combined and give meaning through analogy. For example, ELEPHANT can be expressed by ANIMAL + LONG + NOSE. In addition to the graphic signs that correspond to whole ideas/words, there are also a number of Bliss symbols that constitute grammatical inflections and denote parts of speech, such as PAST, PLURAL, OPPOSITE-MEANING, etc. Thus, the Blissymbolics system has a fairly complex construction, based on combinations of signs, including grammatical elements. The basic signs and combinations may also be joined together to form sentences. Charles Bliss, actually proposed a syntax, but, in principle any word order may be used. In most countries, the word order taught will resemble that of the spoken language (von Tetzchner & Hygum Jensen, 1996). Regarding the vocabulary, there exists a standard vocabulary in Swedish with nearly 500 Bliss symbols. On the standard communication board, there are also letters and numbers.

Blissymbolics was first used in Toronto in the early eighties. It had its peak in the late eighties and since then it has had a decline. Blissymbolics was mainly used for children with physical disabilities, unable to speak, with additional difficulties in learning to read and write. The children in the present study belong to this target group. In addition, one of the children, a girl, has a moderate intellectual disability. The three children have been exposed to Blissymbolics for several years. Two of them, the two boys, have, at the time of the recording, a Swedish standard Blissymbolics vocabulary with a few extra symbols. The children use Blissymbolics to a varying extent. The Blissymbolics are kept on a communication board, a kind of communication aid (Higginbotham et al., 2007). The girl also has a communication board but with larger symbols.

2.2.5 Communication aids and tools

As noted above, it is necessary to keep the words/symbols somewhere, on/in a **communication aid** meant for use in AAC interactional processes. Commu-

nication aids are here defined as physical objects where graphic communication modes are stored and accessed (Higginbotham et al., 2007). Examples of communication aids are: communication boards, communication books, wheel-chair tables, speech-generating devices or computers. Some electronic communication aids have digitized or synthesized speech. To access a communication aid, a communication **tool** is used. Examples of communication tools are a light pointer, a joystick, a stick, a switch or a keyboard.

2.2.5.1 AAC systems

All above mentioned components are used together in a system. The term AAC system is generally used to refer to a communication system in which a person combines all modes, aids, tools and techniques that an individual employs (Blackstone et al., 2007). It may consist of both unaided AAC modes (e.g. signs) and aided AAC modes, both low technology (e.g. communication boards and communication books) and high technology electronic systems (e.g. a computer). It includes natural modes (e.g. gaze direction, head movements, facial expressions, arm/hand movements and other body movements) as well as formal modes (e.g. manual signs as AAC, picture systems and Blissymbolics). It also includes the tools and the different techniques used to index a symbol/word/picture that the tool is employed in e.g. direct selection or scanning. Different methods that are used to construct turns, to initiate a turn or complete a turn (which is the focus of the present work) may also be considered to be included in the AAC system.

2.2.5.2 Impact of tool on the interaction

When exploring aided AAC of the kind that is in focus in the present study, you quite rapidly realize that the communication aid has an influence on the interaction. The participants in the interaction are probably influenced by the communication aid. Kraat (1985) supports this as she points out that communication through these modes probably is different and that the interaction may be accomplished in a different manner than interactions between speaking partners. In connection to this issue, Clarke (2005) and Clarke and Wilkinson (2007) described the interaction with voice communication output aids (VOCAs) as ‘conversations using communication aids’ (Clarke, 2005; Clarke & Wilkinson, 2007). The impact on interaction of the communication aid has, however, not been taken into account to a great extent when studying the interactional process (Light, 1988; Mathy-Laikko & Yoder, 1986/93). Higginbotham (1989) dealt with this issue when he compared between inter-

action with persons using two different communication aids, one communication aid with an electronic output display and one without an electronic output display. The subjects consisted of two dyads of men without impairments. The results suggested that the characteristics of the communication aid are one influencing factor of the interaction style. Interaction with an electronic output display, in contrast to interaction using a communication aid without an electronic output display, seemed to be organized in a less co-constructive manner (Higginbotham, 1989). In article (1) and (2) of the present thesis, the communication aid is found to influence the interaction too. Both co-participants appear to orient to the artifact. This is found in the pre-beginnings where the physical orientation, the gaze and body direction to the communication board is required of both participants.

2.2.5.3 Arrangement of participants and communication board

The participants need to be able to see what the person with SSPI indicates on the communication board and therefore the mutual orientation to the communication aid and thus the position of the participants are important. Thus, aided interaction is more spatially constrained than ordinary interaction.

Schelfen (1976) observed a body position that is used when ordinarily speaking participants are in interaction with each other. He labelled it the 'with' position. The 'with' position is characterized by the participants orienting their bodies towards each other. Kendon (1990) referred to the same phenomena when he described the F-formation. The F-formation is a behavior in which two or more people co-operationally sustain a spatial orientation relationship. The participants stand so that they face inwards to a small space. Interaction is commonly undertaken in this formation. This position is also a prerequisite in interaction for people with SSPI. Robillard (1999), with personal experience of AAC, described the difficulties of interaction when meeting somebody in the corridor or on a path and that it was almost impossible to carry out a greeting and a conversation spontaneously. This is valid for aided interaction using low technology. Whether it is also valid for aided interaction using high technology aids with synthetic or synthesized speech is still to be investigated.

A face-to-face position (also labelled in-person interaction, Higginbotham, 2009) is used in a variation of ways in the interaction. Generally there are three types of seatings identified in ordinary interaction; the vis-à-vis seating, the side-by-side or the corner-to-corner seating (Goodwin 1981). In ordinary interaction the side-by-side arrangement commonly involves a mutual ori-

entation towards a third part or an object. Accordingly, Higginbotham et al. (1988) suggest that side-by-side and corner-to-corner seating are available seatings for communication-board-mediated conversations. The communication partner may also stand behind the person who uses the communication aid, oriented towards the communication aid (Higginbotham, 2009). Corner-to-corner seating has been observed to be the preferred seating (Higginbotham et al., 1988) in aided interaction.

As noted above, the spatial positioning of the participants is constrained in aided interaction. It may differ from ordinary interaction because the participants have the artifact, the communication aid, to orient to. In the materials at hand the participants are positioned in different ways. In the living room at home, the boy, Magnus, is seated in the sofa and the communication partner is positioned beside the boy on the floor, who is in addition, holding the communication board. Thus they are arranged in a side-by-side seating. At school, Magnus and his interactants are also seated side-by-side, in front of a table, with the communication board located in front of them. Regarding the location of the communication aid, although not in the data analyzed here, Magnus in article (1) and (2) is also often seated in a wheelchair with his communication board permanently attached to a wheelchair table. The girl, Maria, in article (3) has a Blissymbolics communication board held by the communication partner or positioned on the table in front of them. The girl's communication board is not used, however, in the data presented in the analysis. In the interaction analyzed with the girl (article 3), the mother is moving about. When having afternoon coffee, the mother is positioned beside the girl and they are seated in a side-by-side position. The mother also stands beside the girl in one instance. The researcher, who also participates in some parts of the interaction, is sitting by the table in front of the girl, in a vis-à-vis seating. At school, the girl and her teacher are sitting in a side-by-side seating, beside each other by a table with the communication aid and toys on the table. As for the third child, Bert and his father are sitting beside each other by the dinner table with the communication board in front of them on the table. Bert and his mother are sitting in a sofa with the Blissymbolics communication board in front, held by his mother. Commonly, the third child, Bert, sits in his wheelchair with the communication board in front on a wheelchair table. It seems that, partly due to the artifact, the 'side-by-side' positioning is common in the materials at hand.

2.2.6 Previous research on aided AAC interaction

As noted, the present study constitutes part of a specific field of investigation, namely, the field of AAC interaction. A short characteristic of the previous research and of the findings will be presented in the section below. A couple of articles that are of specific interest to the present study will be presented in more detail.

Most studies in the field of AAC are conducted on few subjects (van Balkom & Heim, 1991). In that sense they can be considered qualitative. However, commonly the phenomena that are investigated are quantified and therefore the studies may be regarded as quantitative. With the latter way of looking at this issue, the studies that are presented in the section below are quantitative. Specific CA studies on communication disorders are presented in section 2.7.

The research in the field of AAC has traditionally been dominated by quantitative research methods, analyzing interaction through a ‘component model’, that is, approaching interaction using predetermined categories of parts of the interaction (Clarke, 2005; Higginbotham et al., 1988; Mathy-Laikko & Yoder, 1986/93; Müller & Soto, 2000). In contrast to this research methodology, the present work is an attempt to capture the complex communication process, taking into account all simultaneously available resources oriented to by the interactants, without any predefined categories or focus on any specific features to the disadvantage of the whole picture.

Quantitative studies have found AAC interaction to be asymmetric (e.g., Harris, 1982; Light, Collier & Parnes, 1985a; von Tetzchner & Hygum Jensen, 1996). By asymmetric is meant that the interaction is dominated by the speaking communication partner in the sense that s/he has a high proportion of long turns, s/he often initiates the topic, and asks many questions, often in a row and commonly so-called ‘yes/no-questions’. The speaking communication partner’s turns are commonly more complex in terms of more communicative functions. As a result, the person with SSPI has a high proportion of answers to questions and single unit turns. The person with SSPI is often seen as prompting the conversation by expressing a single word which results in an expansion of the topic by the communication partner. Therefore, the person with SSPI is seen as having a respondent and passive role (Light et al, 1985a, von Tetzchner & Hygum Jensen, 1996).

Examples of quantitative studies are the articles of Light, Collier and Parnes (1985a,b,c). In a series of three articles, investigating different aspects of interaction, Light et al. (1985a,b,c) coded free play interaction between eight children with SSPI between 4 and 6 years using Blissymbolics and their

primary caregivers. The discourse patterns, communicative functions, and modes of communication were investigated (Light et al, 1985a,b,c). In the first article, Light et al. (1985a) defined a turn as ‘a unit of discourse characterized by a pronounced pause of 1 second or greater in length in which the partner might or might not take the floor’ (Light et al., 1985:76-77). They found that the primary caregivers produced more than twice as many turns as the children with severe speech and physical impairment. The children fulfilled half of the communicative turn opportunities. Another finding was that the children tended to respond mostly when they were clearly obliged to do so. According to Light et al. (1985a), the communicative behavior of the child was largely predictable given the preceding turn of the caregiver (Light et al., 1985a). Thus, it was noted that the previous turn by the caregiver influenced the contribution of the child. The authors also observed that the caregivers noticed the children’s missing responses and were likely to produce turns which demanded specific responses from the children. The children, in their turn, were less successful in soliciting responses from the caregivers when they initiated topics than when they responded to established topics. In addition, the authors suggested that the turn-taking process in itself was prioritized over the content in the turns. This article is an example of the above mentioned ‘component model’. Categories and codes are predefined from the analyst’s perspective. Several of the above noted observations about the sequentiality in the latter study imply that studies would benefit from the demonstration of sequences of interaction and sequential analyses. However, this is not highlighted by the authors.

A crucial finding in AAC research is that the message of the person with communication impairment using a communication aid is co-constructed to a high degree (e.g., Blau, 1986; Buzolich & Weimann, 1988; Higginbotham, 1989; Higginbotham & Wilkins, 1999; Linell, 1991; Müller & Soto, 2000; von Tetzchner & Martinsen, 1996). This phenomenon is even more apparent in CA studies of communication disorders (Clarke, 2005) and in the present work, also taking a participant’s perspective.

Blau (1986) examined this co-constructive behaviour by investigating the conversations of six adult persons using alphabet boards during conversations with six familiar speaking partners. She found that the co-construction – which she labelled ‘the back-channel act’ – heavily influenced the exchanges. By using a coding methodology she identified five different kinds of listener feedback signals (restatement back-channels, expansion back-channels, query back-channels, correction back-channels, and acknowledgement back-chan-

nels) and one speaker feedback signal (back-back channels). She defined a four move interactional unit consisting of 1) a speaker main-channel act (e.g. question by the speaking communication partner, letter identifications by the person using AAC modes), 2) an auditor back-channel act (e.g., the speaking partners' vocal reproduction and reformulation of the person with severe communication impairment's letter identifications), 3) a speaker back-back channel act (e.g. yes-confirmation by the person with SSPI) and finally, 4) a speaker main-channel act (see above). The back-backchannel signals were produced exclusively by the person with severe communication impairment. The back-channel forms were exclusively produced by the speaking communication partner.

An example of a study on how turns are built up is the unpublished study by Higginbotham (1982) which is referred to in several other studies, e.g., Kraat (1985), Higginbotham (1989) and Higginbotham et al. (1988). It appears to be a qualitative study where the author investigated the construction of turns in aided interaction between an adult using a communication board and his therapist. Higginbotham (1982) found orderly and systematic features of the turn-taking system, consisting of the speaking communication partner articulating the letter or word shortly after a 'point' by the 'augmented speaker'. Certain aspects of hand posture and movement by the user of AAC aids were suggested to project turn exchange. Higginbotham argued that by employing this coordinated turn-taking system the participants could exchange turns rapidly and efficiently and simultaneously provide both partners equal control (Higginbotham, 1989).

Following the same line of interest, although using the Duncan and Fiske¹ (1977) framework of turn-taking in a quantitative study, Buzolich and Weimann (1988) investigated the behavioural cues in interactions between two speakers using communication aids and their speaking communication partner. The person with severe communication impairment used two different formal AAC modes; an alphabet speller and a Handivoice 120 (an electronic communication aid). The authors studied cues that the participants used to yield a turn, during a turn, and to claim a turn. A successful speaker shift was defined as a change in participant state, from auditor to speaker. Buzolich and Weimann (1988) found that the cues used to compose signals in the turn-taking were likely to be influenced by both the communication aid and the available resources for the interactants. The person using the communication

1) Duncan and Fiske (1977) proposed a model for turn-taking. In this model turns are mediated through turn yielding signals.. A turn-yielding signal is described as the display of one or several discrete behavioural cues.

aid had more difficulties to claim a turn than the speaking interactant. The authors also suggested that the participants seem to adjust to each other's pacing and style of interaction.

Buzolich and Weimann (1988) found that the person using the communication aid used relaxation of gesticulation, grammatical completion, and shifting head towards the speaking partner as a turn yielding signal. The speaking communication partner used attention directed towards the communication board or device when yielding a turn. When signaling 'speaker state', the person with the communication aid shifted head direction towards the communication board or device. When the speaking communication partner signaled speaker state he used shift in head and body orientation towards the eyes of the person with the communication aid. In the present work, the phenomena of claiming a turn and completing a turn are scrutinized in article (2).

Other characteristics have been observed in aided interaction. One notable observation from quantitative studies in aided interaction is that communication aids have been found to be used infrequently (Calulator & Dollaghan, 1982; Clarke & Kirton, 2003; Harris, 1982) and the multimodal nature has been emphasized. Thus, the persons with severe communication impairment may use several modes to express themselves in real-time (Blackstone & Hunt Berg, 2008; Blackstone, Williams, & Wilkins, 2007; Higginbotham et al, 2007; Müller & Soto, 2000). Light et al. (1985c) found a connection between the mode of communication and the discourse status and communicative function. Confirmations and denials were expressed mainly by vocalization and gesture. Other studies have found that resources, such as vocalizations and non-vocal body movement, were used to initiate topics and episodes (Ferm, 2006; Light et al., 1985c).

Furthermore, when users of AAC systems communicate with others, especially unknown people, it is also common to use a so-called interpreter who is not the communication partner. The interpreter speaks out loud (and gives voice to) what the person using an AAC aid is indicating (Blau, 1986; Robillard, 1999; Larsson & Thorén-Jönsson, 2007). Another feature found in qualitative AAC studies is the frequent use of meta-communicative comments (Clarke, 2005; Clarke & Wilkinson, 2007; Hjelmqvist & Dahlgren Sandberg, 1996; Ferm, Ahlsén & Björck-Åkesson, 2005).

Many different communication aids have been developed over time and comparisons between them have been conducted. Clinical experience says that high tech communication aids often do not solve the whole problem of achieving mutual understanding (Higginbotham, 1985) and that they are

commonly abandoned (Brekke & von Tetzchner, 2003). Regarding interactional patterns using low technology or high technology communication aids, differences between low tech communication aids and high technology communication aids have been found (Higginbotham & Wilkins, 1999). The use of high technology aids has been observed to be slower and the collaborative construction of contributions conducted in a lesser degree. Wilkins and Higginbotham (2005) describe the use of an electronic communication aid to be more individual-centric (Wilkins & Higginbotham, 2005).

In contrast to these previous studies, qualitative studies of interaction have lately nuanced the picture of AAC interaction in terms of asymmetric interaction (Ferm et al., 2005). When studying all resources used in interaction, Ferm et al. (2005) found that the child with SSPI in their study was not passive with regards to conversational content (Ferm et al., 2005). The child with SSPI initiated a larger amount of other topics than the caregiver did. Thus, the child did not play a passive role in some regards and a different kind of asymmetry was found than is commonly reported in interactional studies of AAC (Light et al, 1985a, von Tetzchner & Martinsen, 1996). In addition, studies of ordinary and institutional interaction have demonstrated that asymmetry is an orderly feature of interaction rather than something deviant and specific for certain types of communication (Linell, 1995).

The quantitative research, as the studies mentioned above, has achieved important insights in AAC interaction. However, by using predefined analytic categories the studies rely to a high degree on the analyst's inference on the analysis. Due to this, information that is essential to understanding AAC interaction may be lost (Higginbotham et al., 1988). The subtle and complex process of AAC interaction may not be captured and there is a risk of getting a too simplistic picture (Clarke, 2005; Higginbotham et al., 1988). The notion of the above mentioned 'asymmetric interaction' is one example of when an inductive interactionist approach captures a more complex picture. There is a lack of studies that investigate the dynamic process as it is, taking multiple resources employed by the participants into account. The present study is an attempt to fill this gap.

2.3 Conversation analysis

This section aims to give a description of Conversation Analysis (CA), shortly outline its influences, central assumptions, its principles and methods, and findings that are relevant to the present thesis.

Conversation analysis started in the sixties, founded by Harvey Sacks in

collaboration with Emanuel Schegloff and Gail Jefferson (Heritage, 1984b). It began as a branch of sociology together with ethnomethodology (EM) (Garfinkel, 1967; Heritage, 1984a), as a reaction to traditional sociology at the time. In those days, mainstream sociology was mainly conducted using pre-defined hypotheses and categories, commonly studying some specific group in society (Heritage, 1984a). The prevailing sociological research methodologies used interviews, field notes, experimental, and quantitative design which gave an idealized picture of social life with little relationship to actual events.

In contrast, EM seeks to identify, analyze, describe and understand the activities that are accomplished in society. The focus of EM is on the methods and resources by which these activities are achieved (Garfinkel, 1967; Heritage, 1984a). Thus, activities are prioritized before outcomes (Francis & Hester, 2004). The situated nature of activities and therefore also language use is in focus. Hence, context is considered fundamental to meaning in interaction. By paying close attention to details, EM focuses on the methods and practices in mundane life, on activities that are familiar and obvious (Garfinkel, 1967). It focuses on the recurrent and how the practices are recognizable to the participants. EM rejects the tendency to view social activities from pre-defined categories. It deals with phenomena that members orient to and that are relevant for them (Francis & Hester, 2004; Garfinkel, 1967).

In the same vein, CA developed as an **empirically grounded** and inductive research method without any preformulated theorizing and categories. In order to capture real social life, CA is strictly datadriven. CA can also be described as a “method for the study of a wide range of aspects of the social world” (Hutchby & Wooffitt, 2008:6). Somewhat less abstract, Drew (1984) describes the aim of CA as “to discover and explicate the practices through which interactants produce and understand conduct in conversation” (Drew, 1984:75). Thus CA investigates social life by examining conversational practices in depth. Below follows some fundamental points of departure in CA.

The aims of CA are to scrutinize the organization of social everyday action by members of society. It is through activities managed in interaction that we conduct our social affairs (Drew, 1984). Thus, CA is not interested in language as such but as a way of organizing social life. CA answers questions such as: How is the interaction organized? What resources and methods are employed to achieve, for example, greetings, invitations, agreement, and turn-taking? What role does a specific method play in the interaction? The conversation analyst looks at structures and patterns in interaction, the ‘machinery’, as Sacks called it (Sacks, Schegloff & Jefferson, 1974). As a consequence of the

interest in finding phenomena, methods and patterns in situated interaction, CA does NOT answer how frequent, how widely a phenomenon occurs, or why a phenomenon occurs.

As noted above, the traditional research methodology in sociology at that time commonly employed survey questions or experimental settings using predefined categories. The sociological research methodology lacked empirical grounding and entailed an idealized picture that distorted and simplified features of phenomena (Heritage, 1984a). As a reaction to this, EM and CA instead seek to analyze social events by observing the construction of them in the specific situated context. Thus, a basic requirement in CA is to use **naturally occurring** data (Heritage, 1984a; Hutchby & Wooffitt, 2008). In other words, data are collected from natural settings in real life. So-called 'raw' data is used for the analysis (Heritage, 1984a). The settings are not designed for the study, thus, not elicited or prearranged. In that way there is a certainty that the phenomena occur in real life (at least once) and that they are not fabricated (Sacks, 1984a). Hence, the data are not removed from its natural sequential context.

In EM, Garfinkel argued that human action in general is intelligible to its participants and therefore it will be conducted in a methodological and orderly manner (Heritage, 1984a). Following the same line, Goffman also argued that interaction is orderly (Goffman, 1983). Influenced by Garfinkel and Goffman, Sacks also found that when closely examining interaction, it exhibited that talk and conversation is organized in systematic and orderly ways. A fundamental assumption of CA was articulated; there is **order at all points** in social interaction (Atkinson & Heritage, 1984; Sacks, 1984b; Schegloff & Sacks, 1973). Order is produced by the participants in the situation and is oriented to by the participants. Thus, patterns and practices are repeated, recurrent and recognizable (Heritage, 1984a; Psathas, 1995).

In order to avoid preconceived hypotheses and analytical bias, the data are looked upon with fresh eyes, **so-called unmotivated looking** (Sacks, 1984a). The analyst does not bring any problems, categories, or hypotheses to the data. Instead, the data are subject to investigation in any direction (Sacks, 1984a). The focus is on phenomena that are **seen but unnoticed** (Garfinkel, 1967). By this is meant that the analysis focuses on conduct that participants intuitively and tacitly orient to but that they do not reflect on in the ongoing interaction (Atkinson & Heritage, 1984). In this way the analyst studies features that are not often conscious to the participants but, still, are patterns that are oriented to by the participants.

In gathering data, audio or video recordings are used because they can be repeatedly played, transcribed, and analyzed. They may also be shown to other analysts. The recording is regarded as the primary data (Sacks, 1984a). In order to be able to analyze the data, a detailed transcription is done. Since conversation analysts aim at investigating tacit and orderly knowledge that is oriented to by the participants, but not in a conscious way, nothing can be excluded and regarded as random or irrelevant. Hence, when looking for the recurrent and systematic patterns, a detailed transcription is crucial and **all details are of potential relevance** (Drew, 2005; Hutchby & Wooffitt, 2008).

The data are analyzed from an **emic** perspective, that is, the perspective taken is that of the participants (Heritage, 1984a; Hutchby & Wooffitt, 2008). By responding to a prior utterance a recipient displays an understanding of that utterance. Participants use the displayed understanding to see if and how they were understood. The analyst can also use this understanding to describe organizational patterns that people use when accomplishing mutual understanding (Sidnell, 2010). Thus, with the emic perspective the analyst uses features from the data that the participants orient to or make relevant in the interaction. The emic perspective is opposed to the etic perspective where the analyst defines hypotheses, issues, and categories to examine in the data, irrespective if these are oriented to or not by the participants. Most studies in the field of AAC take an etic perspective (e.g. see section 2.2.6), thus the present study is rare in the sense that it takes the emic perspective.

At a certain phase in the analysis the analyst uses her/his **membership knowledge** (Hutchby & Wooffitt, 2008; ten Have, 2002), that is, the competencies that all members of society have. It consists of competencies to interact, to understand and act in a sensible manner in situations in society. It is a practical, unnoticed knowledge rather than a theoretical competence. When looking at the data, the analyst employs her/his membership knowledge to understand what the participants are accomplishing (ten Have, 2002). There are different kinds of membership knowledge. Apart from the general knowledge of society, members may also have a specific knowledge of different settings, for example a working place, or a prison or in more extreme cases, living with a disease (Robillard, 1999; ten Have, 2002). Thus, the fact that I, as a speech and language therapist, have met and interacted with persons with SSPI during many years, gives me a kind of membership knowledge.

With the CA perspective you see interaction as collaboratively achieved and intersubjectivity is continuously solved. Conversation analysts take a distributed view of human action which means that they view mutual under-

standing as collaboratively accomplished by the participants in the situation. The emphasis is on the structure of the activity in which it is embedded. Thus, the focus is not on the internal cognitive representations of individuals, nor on their external attributes (father, doctor etc.) (Coulter, 1979; Sidnell, 2010). Additionally, assumptions regarding the intentions, mental states, understandings, emotions or feelings of the participants are avoided, except when these can be demonstrably shown to be oriented to by the participants in the data. Thus, the focus of CA is on the observable matters, what the participants actually do when accomplishing intersubjectivity as social action.

At the time of the founding of CA, traditional linguistics focused on the structures of language, such as the phonological structure of word forms or the syntactic structure of sentences, commonly analyzing linguistic examples that were constructed from the analysts' intuition and/or analyzed out of their context of use in natural dialogue (Mey, 2001). From a CA point of view, a communicative act is always a response to something within a context. Utterances are understood by reference to their placement within sequences of actions. By analyzing sequences of talk the analyst is provided with the understanding of the participants, something that analysts of decontextualized sentences cannot take advantage of. Therefore, extracting examples outside the specific sequence and the **sequential order** is avoided (Atkinson & Heritage, 1984). Hence, context is considered essential in the analysis and the situated local context of turns at talk in particular.

The findings of CA lead to discovering, describing and analyzing organizational practices and patterns of interaction. These structures may be described in context free, consistent, and abstract terms. In this sense CA has several basic assumptions and analytical concepts, although CA is often regarded as a method more than a theory. These concepts are however based on empirical findings.

Characteristic for CA studies is also that data and analyses are presented in a transparent manner. **Data are displayed in a detailed and sequential way** and findings are commonly drawn from excerpts. In that manner, the analysis may be publicly scrutinized, which minimizes the effect of personal influence on the analysis (Heritage & Atkinson, 1984). The reader can follow and agree with the analysis or not. This adds validity to the findings of CA (Heritage & Atkinson, 1984) (For a discussion on validity, see section 3.6).

The term 'conversation analysis' can be misleading due to the fact that you may think that CA examines social casual conversation only. Therefore the term **talk-in-interaction** (Schegloff, 2007:xiii) is frequently used instead. CA

findings have been based mainly on talk, and until recently there has been an emphasis on investigating talk-in-interaction although in a wide range of settings. The present thesis is first and foremost a study of social actions mainly accomplished with other resources than talk. Then, also the term talk-in-interaction may be misleading. However, there is a growing stock of conversation analytic findings that have taken other resources such as gaze, gestures, and body movements into account. These studies focus on ordinary (spoken) interaction (e.g. Goodwin, 1981; Rasmussen, 2010; Streeck, 2003) but also on interaction with persons with severe communication impairment (e.g., Bloch & Beeke, 2008; Brouwer, Day, Ferm, Hougaard, Rasmussen & Thunberg, 2011; Clarke, 2005; Rhys, 2005; Schegloff, 1998; Wilkinson, 1999; Wilkinson, Bloch & Clarke, 2011). Although the present work mainly deals with other resources than talk, the central focus is still the same, i.e. to study the organization of social activities, manifest in the locally unfolding interaction.

In earlier studies of CA the emphasis was mainly on ordinary, casual, everyday conversations, especially telephone calls. This original branch of CA is called **basic** CA. In this field of investigation the basic features of interaction are examined, e.g., turn-taking, turn construction, sequence organization, and repair.

As the research has developed, CA has for some time now also involved studies on **institutional interaction**. The focus of these studies is on examining institutional interaction for its distinctive features (Heritage, 1984b). Institutional interaction is interaction where there is some kind of professional work taking place, where one of the participants is paid to interact. This can be, for instance, doctor-patient interaction, court-hearings, or classroom interaction.

Applied CA is another branch of CA (e.g., Bloch, 2005; Dickerson et al., 2005). It employs the same rigorous methodology as CA in general but pays attention to somewhat other phenomena and the findings are used to inform professionals (Richards, 2005). Findings in CA are empirically grounded and therefore suitable to guide professionals, but it is important to be cautious of not interpreting the findings as laying down laws of behavior (Richards, 2005). A more fruitful way of looking at the findings of CA is viewing them as a description of regularities and that these descriptions may facilitate new levels of awareness and development of sensitivity to specific phenomena among professionals. The present work may be considered to belong to this branch of CA in the sense that it can be used to guide professionals working in the clinical field of AAC.

2.3.1 Central findings and assumptions in CA

In CA, conversation is investigated as part of a larger picture, aiming at a science of **social action** (Drew, 1984). Thus, an important starting point for the analysis in CA is the social actions or activities that participants conduct. We do things by interacting. Thus, participants organize social actions in and through interaction, by taking turns. These actions can be, for instance, greeting, agreeing, insulting, wanting something, inviting, or pointing at something. Since interaction consists of turns and turn-taking, these become the primary units of CA analysis (Heritage & Atkinson, 1984). Sacks, Schegloff & Jefferson (1974) studied how turn-taking is organized and described social norms that participants orient to, for instance, that participants in interaction do not speak all at once. Instead, they take turns one after another. This process is called turn-taking (Sacks et al., 1974). Based on their findings, Sacks et al. (1974) proposed a model for the **organization of turn-taking** (a speech exchange system). They observed and described the organization of turn-taking in conversation and identified two components of the turn-taking system, the **turn-constructural component/unit** and the **turn-allocational component**. The turn-constructural component handles how turns are finely organized so that a smooth transfer between turns is achieved and that overlap is avoided and that pauses are kept short. It deals with how the participants can anticipate a possible turn ending and how the turn should be interpreted. The turn-allocational component deals with participant's own practices of selecting a next speaker and how this is organized on a turn-by-turn basis. The turn-constructural component will briefly be sketched below since it has a specific importance for the present work.

Sacks et al. (1974) found that participants in conversational interaction orient to and organize turn units. As mentioned above, Sacks et al. called them turn-constructural units (TCUs), the most fundamental building block of a turn (Sacks et al., 1974; Schegloff, 2007). Turns may consist of one or more TCUs which comprise, for example, sentences, phrases or lexical items. A characteristic three-fold feature of a turn is that 1) it is typically related to the previous turn, 2) it accomplishes something by itself, and 3) it makes out the trajectory of the coming turn (Sacks et al., 1974). Another characteristic of a TCU is that it has projectional features so that the hearer may project what kind of turn/action is accomplished and when the turn may end. Therefore, there is commonly little gap and little overlap between turns. Thus, Sacks et al. found that as a speaker approaches a possible completion of a turn, a possible transition to another speaker may become relevant. They called this

place a transition-relevance place (TRP). Furthermore, Sacks et al. found that participants orient to the social norm 'one speaker at a time'.

Sacks et al. (1974) sum up their observations as below:

- 1) Speaker-change recurs, or at least occurs.
- 2) Overwhelmingly, one party talks at a time.
- 3) Occurrences of more than one speaker at a time are common, but brief.
- 4) Transitions from one turn to the next with no gap are common. Together with transitions, characterized by slight gap or slight overlap, they make up the vast majority of transitions.
- 5) Turn order is not fixed, but varies.
- 6) Turn size is not fixed, but varies.
- 7) Length of conversation is not specified in advance.
- 8) What parties say is not specified in advance.
- 9) Relative distribution of turns is not specified in advance.
- 10) Number of parties can vary.
- 11) Talk can be continuous or discontinuous.
- 12) Turn-allocation techniques are obviously used. A current speaker may select a next speaker or parties may self-select in starting to talk.
- 13) Various 'turn-constructural units' are employed, e.g., turns can be projectedly one word long, or they can be sentential in length.
- 14) Repair mechanisms exist for dealing with turn-taking errors and violations, e.g., if two parties find themselves talking at the same time, one of them will stop prematurely, thus repairing the trouble.

(Sacks, Schegloff & Jefferson, 1974:700-701)

Even though the 'turns' that are constructed by the children in the present study are not always 'turns-at-talk' as defined in the seminal paper by Sacks et al. (1974) (or in CA in general), these turns still remain to be investigated. The first article of the present work is devoted to the organization of turns in aided interaction. The second article focuses on methods for turn transition and how the child claims and yields a turn. The third article illustrates participants' methods for coordinating arm/hand movement to create turns and action. For further descriptions of turns-at-talk, turn-taking, turn design and turn transition, see article (1) and (2).

Turns are connected with one another in systematically organized patterns of turns, in **sequences** of turns (Schegloff, 2007). Thus, as well as turns

are structured orderly, sequences of turns are also organized in structured ways, in a sequence organization (Sacks, 1992; Schegloff, 2007). Adjacency pairs (Sacks, 1992; Schegloff, 2007) are an example of a sequence organization that is oriented to by participants in interaction. By orienting to and producing adjacency pairs, the participants display their understanding of what each utterance aims to accomplish. **Adjacency pairs** are thus fundamental to accomplishing and displaying mutual understanding (Hutchby & Wooffitt, 2008). Furthermore, Sacks argued that the distribution of adjacency pairs is a basic mechanism for making the participants listen in interaction (Sacks, 1992).

Characteristic for adjacency pairs is that they are produced by different speakers and produced in adjacency to each other. Furthermore, adjacency pairs are organized through first, a first pair part and then, the response, a second pair part (Sacks, 1992). Examples of adjacency pairs are a greeting that is responded to by a greeting, or a question that is followed by a response. An invitation makes an acceptance or a declination a relevant next turn. In addition, there is an expectation that the second pair part should be produced after the first pair part and if it is not produced, the absence is considered noticeable. This expectation is labelled **conditional relevance** (Drew, 1984; Hutchby & Wooffitt, 2008; Schegloff, 1968) and adjacency pairs are one example of this.

Other empirical findings have shown that not all second pair parts are oriented to as equivalent. Pomerantz (1984) studied agreeing and disagreeing with assessments. She found that sequences with second pair part disagreements were organized differently from agreements (Pomerantz, 1984). The difference in design was called **preference organization** (Pomerantz, 1984; Sacks, 1987). The design of a preferred second pair part is simple, rapid and short. A dispreferred response is commonly produced with delay, a pause, a hesitation or/and an explication. Acceptance or grantings have also been found to be produced in different ways than their negative alternatives. Pomerantz argued that the reason for the preference organization may be that interactants orient to agreeing with each other as comfortable and supportive and vice versa, that disagreement is oriented to as unpleasant and insulting (Pomerantz, 1984).

Another generic feature employed in interaction is **repair**. When talking, people frequently encounter problems of mutual understanding/intersubjectivity (see section 2.3.2, for a further description of mutual understanding/intersubjectivity). These can be problems of hearing, speaking, and understanding (Schegloff, 1994). When these problems occur, participants have access to

a mechanism that is called the repair mechanism through which they restore the interaction. Repairs are conducted ‘on-line’ in the developing interaction.

Repair is used for a wide range of phenomena. Two kinds of repair have been identified. First, procedural repair, which is a type of repair that deals with various aspects of the turn-taking procedure e.g. overlap or other disfluencies in the turn-taking (Hutchby and Wooffitt, 2008). When overlap occurs, one co-participant tends to stop speaking, and hence does a repair. By doing this the co-participant orients to the turn-taking norms (Sacks, Schegloff & Jefferson, 1974). The other kind of repair is when participants handle a problem of mutual understanding and the unclarity may be so large that the intersubjectivity is not sufficient for current purposes. In that case the participants do a repair to renegotiate the sense-making. The problem, the segment of talk to which the repair is addressed, is called the trouble source (Schegloff, Jefferson & Sacks, 1977). Repairs are not only corrections but refer to a wider domain of occurrences, for example, a repetition or a reformulation.

A large amount of research has been conducted in CA regarding repair, e.g., Jefferson (1972), Schegloff, Jefferson and Sacks (1977) and Schegloff (1992, 1994, 1997). These studies have resulted in the identification of specific patterns of repair. A repair can be initiated by the speaker (of the trouble source) and is then called self-initiated. It may also be initiated by the listener and is then called other-initiated. The repair may be carried out by the speaker and is then called self-repair. It can also be carried out by the listener and is then called other-repair. Four types of repair have been identified. These are self-initiated self repair, other-initiated self repair, self-initiated other repair, and other-initiated other repair (Schegloff et al., 1977). Research has shown a preference organization for repair with self initiated repair as a preferred repair before other initiated repair (Schegloff et al. 1977).

2.3.2 Discussion of mutual understanding and intention

As discussed above, CA (and EM) are not concerned about the participants’ intentions and motives. Instead, the accomplishment of mutual understanding and intersubjectivity is central. More specifically, the focus is on the interactants’ methods and resources by which intersubjectivity is achieved (Heritage, 1984a). EM and CA look for the recurrent practices and how they are recognizable to the participants (Heritage, 1984a). The approach is, thus, to study the operation – how it is dealt with by the participants in interaction. Mutual understanding is seen as constantly achieved and displayed in the ongoing interaction. Thus, intersubjectivity is viewed as the joint construction of

meaning accomplished by people in the unfolding interaction with each other (Heritage, 1984a). It is maintained on a turn-by-turn basis. An understanding of the previous turn is displayed in the next turn. Participants in conversation look to a next turn to see how they have been understood. The next turn then, the third turn, is a place where you either accept the recipient's displayed understanding or not. If you do not accept the displayed understanding, you may do a repair. A repair can then be considered to be a practice that aims at restoring intersubjectivity and is a proof that we, co-participants in interaction, accomplish a shared understanding that is sufficient for current purposes (Schegloff, 1994) (for a further description of repair, see section 2.3.1)

Schutz (Heritage, 1984a), a phenomenologist who has influenced EM and CA, argued that people can never be sure to understand each other completely because they cannot have identical experiences. However, this is not a problem because interactants constantly solve the problem of intersubjectivity in everyday situations (Heritage, 1984a). When people talk there is always an underlying assumption of a mutual understanding and people act as if they understand each other (Heritage, 1984a). Hence, people make sense and attribute intersubjectivity to what others say and do. Vice versa, people construct (in saying and doing things) actions that others make sense of (Francis & Hester, 2004).

As mentioned, complete mutual understanding is never certain to be achieved between any interactants. However, regarding interaction between non-speaking participants and their communication partners, it is a salient fact that the interactants accomplish mutual understanding that is sufficient and not more than sufficient, for current purposes. Persons with SSPI do not have access to the full body of resources for engaging in social interaction, such as ordinary (grammatical and prosodic) ways to accomplish turns, to smoothly initiate and resolve repair (Bloch, 2011), or to initiate (Clarke & Wilkinson, 2008) and close sequences (Marková, Collins & Murphy 1997).

Within the field of AAC, communicative 'intent' has been deeply investigated regarding people with intellectual disabilities (Grove et al., 1999; Iacono et al, 1998).² The reason for this interest may be that due to ambiguous expressions, troubles may arise in accomplishing sufficient mutual understanding between the person with an intellectual disability and her/his communication partners. There is a risk that invalid meaning is attributed to the person with the impairment. Persons with severe impairments (as one of the children

2) Intellectual disability here refers to impairments in cognitive abilities as defined in Cognitive Psychology (Potter and Edwards, in press) (see section 2.4.3).

has in the present thesis) may, according to Grove et al. (1999) have difficulties that might make mutual understanding difficult. The difficulties that the person with intellectual disability may have are a) a high dependence on others to make themselves understood b) a level of awareness of their own intentions which is low, or difficult to determine c) a level of comprehension which is low, or difficult to determine d) a limited independent ability to use formal linguistic code in any modality: speech, manual signs or graphic symbols e) inconsistent ways of communication leading to ambiguity of meaning f) a tendency to acquiesce to the suggestions of others and g) an inability to contradict an interpretation and say 'no, that's not what I meant' (Grove et al., 1999).

Due to the fact that there is a risk of not achieving sufficient understanding motivates in depth studies of how intention and meaning is created and organized by the participants in the unfolding interaction. Below, I will briefly outline what has been considered to be influencing factors in previous research on intention and some findings from research on infants and their development of communicative intentions.

In the traditional cognitive perspective, intention is defined as the message a speaker wishes to convey (Granlund, 1991; Olsson, 2006; Stamp & Knapp, 1990). The message is considered static and the origin within the individual. It is seen as an internal individual phenomenon.

From this perspective, there are considered to be four developmental levels of intentionality which range from total lack of awareness to awareness of intent. These are a) behaviours that are reactions to maintain body system balance, b) behaviours that are intentionally used, c) behaviours that are intended to affect another person, and d) behaviours that are intended to affect the opinion of another person (Granlund & Olsson, 1999). A distinction is made between intentional behaviour and intentional communication where intentional communication is considered to be marked by the use of coordinated alternating attention between the object and the person (Iacono, Carter & Hook, 1998). In line with this, Harding (1983) found that twelve infants' communicative behavior, from the age of six to eleven months, followed a five stage development from; procedural behavior, object-directed instrumental behavior, intentional gestures, intentional vocalizations, to coordinated intentional communication involving gaze, gesture, and vocalization. In the three last stages, from intentional gestures and forward, the infant's alternating gaze at the mother and the desired object was observed.

From an interactionist point of view, the concept of intention is considered problematic (Heritage, 1990/91). With this perspective, intention is seen as

something that is interactively and collaboratively accomplished. The intention or meaning is constructed and negotiated in the unfolding interaction (Coulter, 1979; Linell, 1991). Intention can change during the process of interaction, and there may be multiple intentions co-existing (Coulter, 1979). Speakers do not always know in advance what they are going to say. Interactants assume that each participant's conduct is voluntary and therefore accountable. Heritage (1990/91) discussed the constraints of the use of the concept intention. He argued that there are several reasons for viewing the use of intention as an analytic concept as problematic. First, it is difficult for an analyst to know the intention of somebody's actions because interactants orient to the normativity of the rules, but the substance of the rules themselves is opaque. For example, the normative rules of turn-taking (Sacks et al., 1974) are oriented to by interactants, but they are not talked about. Hence they are not visible and not the object of conscious orientation. Secondly, Heritage showed with examples from naturally occurring conversation that it is also difficult to determine at which point an intention is formed and, thereby, it is also difficult to know its scope. Thirdly, unconscious skill and conscious mastery of conversational procedures are highly indistinct in attributions of intent. Heritage exemplified this by a game of tennis. It is not possible to know if the stroke by one participant is the result of an unconscious reflex or of a conscious mastery of the action, or both. Heritage (1990/91) concluded that intent is properly analyzable as a locally produced phenomenon and not as a global interpretive resource. Consequently, since it is not possible to know the true (inherent) intent of anyone, the term 'intention' is avoided. The focus of CA is instead on how participants in the unfolding interaction 'ascribe' and 'attribute' intention' to each other.

The interactionist view on intention appears even more relevant when it comes to infants or, as in the present study, persons with severe communication impairment. Parents are found to respond to and attribute intentionality to infant vocalizations (Papousek, 1995).

In the same vein, Ninio and Snow (1996) also studying infants, argued that...

"the only existing criterion for attributing intentional action to the other [is that] the interpretation makes sense and works in the interactive situation." They continue "... it [intention] is built ... on subjectivity and intersubjectivity, on assumptions about the other and attributions of shared understanding. Although we can agree on clear cases of intentional communication and clear cases of non-intentional communication, objective criteria will not help us in the

border country of childrens' early words. All we can rely on there are common sense formulations - if it communicates it is communicative.”

(Ninio & Snow, 1996:52)

Regarding persons with severe impairments, Olsson (2004) referred to intention as the co-created outcome of interpersonal interaction. She argued that intention is something that is inferred and that judgments of an intentional state are formed on the basis of context, prior knowledge, and the intuition of the listener (Olsson, 2004).

Hence, in line with Heritage (1990/91), within the interactionist approach, the focus in the present work is on the process of how intent is collaboratively constructed (Coulter, 1979; Linell, 2009; Stamp & Knapp, 1990). Article (3) in the present work elucidates how the participants organize the ascription of intention and meaning in everyday interaction.

2.3.3 Visible body movements – bodily action

As noted above, until recently most CA studies have focused on talk (Steen-sig, 2001). Noteworthy is that the method was first developed through studies of telephone calls (Hutchby & Wooffitt, 2008). However, following the increased use of video recorded data, research in social interaction has extended its notion of language use to include a wider scope i.e., the simultaneous use of different kinds of semiotic resources – **multimodality** (Streeck et al., 2011:4). These are, e.g., the use of gaze, facial expression, gesture, other body movement, body posture, and spatial orientation. Multimodality can also include other resources in the process of local ‘contextual configuration’ (Goodwin, 2000) such as artifacts in the surroundings, the sequential organization, and the participation framework. The term contextual configuration refers to several semiotic fields that the participants orient to in the locally unfolding interaction. In the case of AAC, this series (or array) of fields are constructed from the specific interaction modalities used (e.g., talk, Blissymbolics, gaze direction, facial expression, arm/hand movement), the artifacts, the sequential structure, and participation frameworks. As the interaction develops, new semiotic fields are added or organized in new ways. This means that the contextual configuration undergoes a constant change (Goodwin, 2000). Research has shown how multiple modes are **co-ordinated** and deployed simultaneously with talk or with each other and talk. Today, most scholars argue against the separation of so-called ‘verbal’ and ‘nonverbal’ behavior (Streeck et al., 2011). Thus, what was earlier regarded as separate channels of

behavior in formal linguistics (e.g., Ekman, 1973) has now changed (Streeck et al., 2011). Many researchers have documented bodily action to be used in concert with each other (e.g., Goodwin, 1981, 2000; Heath, 1986; Kendon, 2004; LeBaron, Mandelbaum & Glenn, 2003; Mondada, 2006; Streeck, 2003, 2009; Schegloff, 1998). Research has shown that talk and other bodily action co-occur as phenomena that are interdependent and not separable modes of communication (Streeck et al., 2011). Thus, participants in interaction are now recognized to employ several modalities, that is, they are multimodal (Streeck et al., 2011).

There is a discussion in the CA community about whether these latter studies may be considered as CA studies or not. According to Heath (1986), bodily actions do not necessarily function within the turn-taking system that is found in talk-in-interaction. Still, he argues, the sequential character of social interaction may be used as a resource when analyzing bodily actions because they are sequentially organized and they are also produced locally in the ongoing situated interaction (Heath, 1986). Therefore, it can be concluded that, as well as turns-at-talk, actions through body movements are understood through their sequential position in the unfolding interaction (Heath, 1986; Streeck et al., 2011).

The discussion of whether these studies are CA studies or not will not be penetrated in detail here. However, it is worth mentioning that the studies are in line with the CA research methodology in that they follow the fundamental assumptions of CA. They are as mentioned above: Interaction is viewed as a process in which sense is made through participants' actions and methods. Naturally occurring interaction is investigated and data are sequentially analyzed from the participants' perspective. Furthermore, the analysis is datadriven and inductive without predefined models or categories. Interaction is considered as orderly, thus, accomplished in systematic, recurrent, and recognizable ways.

The present study focuses on interaction between children with SSPI and their everyday communication partners. The fact that one of the participants in the interaction is unable to speak results in a wider use of multimodal resources, resources such as vocalizations, gaze direction, head movements, facial expressions, arm and hand movements, and other body movements. As a natural consequence, the analyses in the present study, in the same vein as CA studies of multimodality, focuses on co-ordinated practices of bodily action and takes multiple interactionally relevant modalities and resources into account.

The study will show how gaze plays an important role in the data of the present thesis. It is used as a resource both in turn initiations and turn completions (art 2). It is also employed in coordination with arm/hand movement to create meaning (art 3). The relationship between talk and eye gaze in ordinary interaction has been investigated (Goodwin, 1980, 1981; Heath, 1986; Kendon, 1967; Streeck et al., 2011). Gaze has been observed to have several essential functions in the organization of turn-taking (Goodwin, 1980, 1981; Kendon, 1967). Goodwin (1980, 1981) investigated eye gaze and its relation to the beginning of a turn as a means of achieving mutual orientation. Generally, speakers achieve mutual gaze at turn beginnings (Goodwin, 1981; Kendon, 1967). They also look at the listener – and the listener looks at the speaker – during turn completion. On the contrary, during mid-turn, speakers tend to look away and so does the listener. Hence, mutual gaze is common in turn transition. In turn initiation, Goodwin (1981) also showed that if the speaker does not obtain the gaze of the hearer, he may produce certain actions, such as restarts and pauses. After such ‘phrasal breaks’ the hearer, who was not gazing, may move his/her gaze towards the speaker (Goodwin, 1981).

Another function of gaze can be found in, for example, in ‘word searches’ (Streeck, 2009). In the beginning of a word search, the speaker may look away, thereby not inviting the recipient to participate in the search. This action may be understood as if the speaker tries to solve the problem by himself. Next, the speaker may turn to the listener, encouraging him to participate (Streeck, 2009).

The present study will also show how arm/hand movement has a prominent function in the data at hand (art 3). As described above, this action is sometimes referred to as gesture. Gesture is frequently defined as communicative bodily action with the hands (Streeck, 2009). In the present study the term bodily action encompasses gesture and other bodily action that influence the unfolding interaction. (For further considerations concerning bodily action and gesture, see section 2.1.1). Several scholars using CA have examined the function of gesture in ordinary interaction (e.g., Goodwin, 1986; Laursen, 2002; LeBaron & Streeck, 2000; Schegloff, 1984; Streeck, 1993, 2002, 2003, 2009; Streeck & Hartge, 1992).

Bodily action with, for instance, the hands, can be employed as a method to construct the main content and, like talk, may also be organized in turns (see section 2.3.1). An example, found in the data of the present work, is when one child with SSPI points at himself, and this action is voiced and treated as ‘I’ and responded to. (This example is not the focus of any of the articles and,

therefore, not presented in any transcript.) The bodily action is here employed as a method to construct the content of the turn.

Apart from methods to construct the main content of the turn, gestures can serve many other functions. So-called 'speech-handling' is one (Streeck, 2009). (Kendon (1995) calls similar phenomena 'pragmatic gestures'). Streeck (2009) describes speech-handling as enacting a communicative function, for example, when a participant raises the hand with the palm facing the co-participant, and it is treated by the co-participant as a signal to wait for the turn (Streeck, 2009). Furthermore, a speech-handling gesture is coupled with interaction units such as turns, turn-construction units, and are about the process of communication. For example, Streeck and Hartge (1992) suggested that one common function that gestures may have is to precede or anticipate the speech unit with which they share semantic content. This functions as a framework of participation and as a 'turn-entry device'. So, for example, Streeck and Hartge (1992) studied interactions with participants speaking Ilokano, a Northern Philippine language. The gesture 'A-face' was explored among several other gestures. It is a facial expression associated with and preceding the articulation of the phoneme [a]. The data showed that A-face is a gestural enactment recognized and used as a quasi-conventional display of a participant's shift from listener to speaker-alignment.

Mondada (2006) also investigated the phenomena of speech handling, but as constructed by a movement of an artifact. She found that participants may regulate turn-taking using body movement and an artifact. A participant at a meeting in an architect's office projected the end of his turn by taking the plan that had been the focus until then and put it aside, either at the end or before the end of the turn. This action was oriented to by the other two participants who expanded the previous sequence. Then the plan was put back again on the table by the first participant. Thus, the speech was managed by the moving of an artifact, a plan.

In another study, not involving speech-handling, but rather focusing on gesture that is foreshadowing the meaning of a word, Streeck (1993) demonstrated that by visibly orienting to hand-gestures the speaker can make these overtly relevant to the talk (Streeck, 1993). He found a pattern of, firstly, a shift of gaze to the gesture at the start of the gesture. Secondly, as the word was produced, which the gesture was tied to, the gaze returned to the listener. Many gestures occur prior to the words they are connected to. In that way, the gesture may foreshadow a more definite meaning on its way, that is, the word. Thus, gaze may be used in coordination with gesture and speech.

Goodwin (1986) found that bodily action may be employed as a resource for the organization of mutual orientation. It may establish a point of orientation. By contrast, some body movements, such as self-grooms, may be performed during talk and are not treated as relevant by the recipient who is looking away. Heath (1986) found in a study of doctor-patient interaction that speakers use a wide variety of movements to elicit another's gaze (e.g., tugging a shoulder and clutching one's stomach) in order to encourage the recipient to turn towards the face of the speaker. When the relevant action is absent, further attempts, frequently through modified or new bodily action, may be used to elicit the appropriate response. Hence, people may use body movement to encourage each other to attend and participate in an activity, without addressing the problem of involvement as a topic in its own right (Heath, 1986).

Regarding mutual orientation, the boy Magnus in the data at hand and his communication partners have to do some interactional work to achieve the mutual orientation to the communication board in order to initiate a turn (article 2). This can also be considered a speech-handling. In parallel with Heath (1986), the use of gaze at the communication board also makes the communication board relevant to the interaction. In addition, the post-completion gaze used in the data can also be considered a speech-handling action. Regarding methods to elicit the mutual orientation in interaction between people who lack some capacities, McIlvenny (1995) described attention getting methods in interaction with deaf people using sign language. He concluded that deaf people have to do extensive work to accomplish mutual orientation in the beginning of a turn and that they can only gain a right to a turn if others are looking at them (McIlvenny, 1995). Pedersen (1996) showed that pointing may be employed to claim the turn in Danish sign interaction. Thus, the mutual orientation of the participants and speech-handling actions seem crucial to people using sign language and persons with severe speech impairment.

Pointing is another widely used bodily action that is relevant to the present work. It has also been explored by several researchers using CA methodology. Streeck (2009) argued that, in ordinary interaction, pointing may be employed when the indexed item lies at a distance but can be seen (Streeck, 2009). Pointings enable the parties to identify individual targets that are out of reach (Streeck, 2009). Further, according to Streeck, the practice of pointing only works if it is coupled with talk (Streeck, 2009). Pointings may have different functions, for example, to mark an object, a place or a region, or indicate a search for a word (Streeck, 2009). Regarding the link between talk and the act

of pointing, the conclusions by Streeck will be demonstrated in article (3) of the thesis to not be of immediate relevance for body action in the present data. The bodily action of gaze direction in coordination with arm/hand movement is not coupled with talk (related to the girl with SSPI). Additionally, the object is not out of reach or at a distance in the data at hand. Thus, pointing appears to have a wider use in interaction with persons with SSPI.

Haviland (2000) explored pointing in language acquisition by scrutinizing two infants from the community of Zinacantán, Mexico. According to Haviland, it is widely acknowledged that there are physical precursors to the developmental stages of bodily action, such as pointing (e.g., reaching/touching precedes pointing) (Haviland, 2000). In article (3) of the present work, the practices of coordinating gaze direction and arm/hand movement to create meaning are explored. It is difficult to know, for sure, if the action by the child should be labelled reaching/touching or pointing. The choice of label could indicate that the girl is at a specific developmental stage. However, the labelling will not be penetrated here. The focus is on the action that is treated as a contribution to the ongoing interaction.

In addition to discussions about the relevance of multimodal/visible bodily action to CA analysis of interaction, there has recently been an increasing interest in discussions about possibilities and limits of CA in studying such multimodal/visible bodily action and the way this action may be employed when constructing turns, turn-taking, and in turn transition. As an example of the accelerating interest of this, two panels, which addressed these issues at the recent EMCA conference, can be mentioned (10th Conference of the International Institute for Ethnomethodology and Conversation Analysis, 2011, Fribourg) (Mortensen & Hazel, 2011; Ticca & Pasquandrea, 2011).

2.3.4 Dialogism

Dialogism may be considered a theory attempting to embrace the methods employed in the field of CA (Steensig, 2001). Since researchers in the field of AAC find models of communication of interest (Lloyd et al., 1990), I will outline this particular theory shortly, below, despite the lack of interest in theories in CA itself (Heritage, 1984a). Dialogism seems to be well suited for attempts at modeling the process of AAC since the theory focuses on co-construction by the participants and the idea that languages and codes do not have stable meanings, but are negotiated in the unfolding interaction, as we shall discuss below. The theory has received some interest from the research field of AAC.

‘Dialogism is a meta-theory about action and participation, thinking and communication between people in the real social world.’ (Linell, 2009: 214, for an in depth description see Linell, 2009) It argues that interaction occurs in and is dependent on dialogue with other participants and other contexts. An act, or a turn, is thus not definable or analyzable as a unit which is independent of the context. Interaction is influenced by both the global and the local context. The global context can be a situation type, a setting and a frame. Dialogism also encompasses society, language, and mind. The sequential organization is regarded as the local context. Every contribution, action, is a response to the prior action and does in itself project a next contribution/action. Dialogism regards interaction as a dynamic process and collective endeavor, accomplished by all participants simultaneously. In other words, dialogism, as well as CA, emphasizes context-dependence and collaboration in organization and understanding of interaction. Interaction is regarded as collaborately constructed, a situated and locally achieved ongoing process. By embracing society, language, and mind, the scope of dialogism is wider than the scope of CA, which solely encompasses the social interactional and in this sense ‘local’ context. The global context is included in CA if it is oriented to by the participants in the ongoing local interaction.

The dialogistic theory is an alternative to ‘monologism’. Apart from the macro-perspective in dialogism -- with focus also on the global context -- CA fits in well with dialogism. One of the critiques against dialogism is that it lacks research methods (Linell, 2009). However, CA is one of the methods that is considered to be used in this paradigm.

In *Rethinking language, mind and world dialogically*, Linell says, “Monologism’ has been the dominating theory for a long time. It considers cognition to precede communication and ideas and thoughts are viewed to be individually represented and transmitted in communication” (Linell, 2009:37). Monologism regards language as a static system. For instance, sentence length, grammatical completeness, and rate are counted. By contrast, in dialogism, you assume that cognition and language influence each other reciprocally and that they are interrelated. It is impossible to say what comes first, cognition or communication. Furthermore, dialogism considers languages and codes not to have stable meanings. Instead they have ‘partly open meaning potentials’ (Linell, 2009:40). These are used together with contexts so that co-participants can reach a specific interpretation. Intention is also regarded as something that is co-authored (see section 2.2.6.1). Another fundamental assumption in dialogism is that there is no perfect communication, no such

thing as a complete understanding. Instead, there are sufficient and partial understandings for current practical purposes (Garfinkel, 1967; Linell, 2009).

When it comes to interaction with people with severely challenged communicative capacities due to impairments of some kind, dialogism may stand out even more (Linell, 1991). In challenged interaction the features of co-construction become even more evident. Due to the fact that interaction is seen as a collective process -- when problems in interaction occur -- they are also seen as collective responsibilities, and the solutions lie not in one but in both participants. Following the same vein, it is argued that a misunderstanding is not a singular act done by one individual, but rather something that is done collaboratively. Here dialogism and CA also support each other.

Although dialogism sees interaction as a dialogical phenomenon, it leaves room for monological practices. According to Linell (2009), a theory always involves monological practices at some level (Linell, 2009). Despite the idea that interaction is highly co-constructed, all the communicative abilities are not considered to be co-constructed and socially distributed. This is something one becomes aware of when observing interaction wherein one of the co-participants has a disability that effects the interaction, as in the present study. Dialogism, as well as CA, does not deny that there are intrapersonal cognition and other individual abilities, etc. However, they both cover the interaction process alone and what is possible to observe.

2.3.5 Previous research on severe communication disorders using CA

The use of CA in studies of communication disorders is growing. The studies are diverse since they analyze interactions across gender, age, communication mode, and impairments based on medical diagnoses.

Interaction involving persons with aphasia has received a particular interest (e.g., Bloch & Beeke, 2008; Goodwin, 2002; Goodwin, Goodwin & Olsher, 2002; Heeschen & Schegloff, 1999; Klippi, 2006; Laakso & Klippi, 1999; Lind, 2001; Rhys, 2005; Wilkinson, Beeke & Maxim, 2003). Interaction involving children with different disabilities has also been investigated (e.g., children who are deaf – e.g., Mahon, 2009; and children with autism, e.g., Dickerson, Rae, Stribling, Dautenhahn & Werry, 2005).

Although studies in the field of AAC that employ CA as a research method are few, they are increasing in number. Message construction and time factors have been investigated by Higginbotham (1982), and Higginbotham and Wilkins (1999). The delayed progressivity was found to be oriented to in analyses of interaction between children using VOCAs and their peers (Clarke,

2005; Clarke & Wilkinson, 2010). It has been argued that the fact that the temporal order is altered may place a heavy constraint on the interaction (Higginbotham & Wilkins, 1999; Robillard, 1999). Turn transition has been scrutinized by Higginbotham (1982) and Clarke and Wilkinson (2010) (for a brief description of the study by Higginbotham, and Clarke and Wilkinson, see below and article (2).) Collins, Marková, and Murphy (1997) examined methods for closing turns (1997). Collins (1996) studied referring expressions (for a brief description, see below), Bloch and Wilkinson (2004) investigated understandability as opposed to intelligibility in interactions involving adults with progressive conditions (for a brief description, see below).

Regarding the asymmetry in interaction which has been observed in many quantitative studies (see section 2.2.6), Clarke and Wilkinson (2007) showed that there might be interactional motivations for the asymmetry. In their data the speaking partner provided a location for the use of the VOCA. Clarke and Wilkinson suggested that this may be something that both participants may have found advantageous. The present study may also contribute to nuance the picture of asymmetry.

Most CA studies in AAC have focused on interaction involving adults. Clarke (2005), Clarke and Wilkinson (2007, 2008, 2009, 2010), Brouwer, Day, Ferm, Hougaard, Rasmussen Hougaard, and Thunberg (2011), Sigurd Pilesjö and Rasmussen (2011), Sundqvist, Plejert, Rönnerberg, *in press*) are examples of a few studies that involve children. Regarding intellectual disability, several studies have been carried out (e.g., Antaki, Finlay & Walton, 2007; Finlay, Antaki & Walton, 2007; Tucker & Kretschmer, 1999). However, CA studies focusing on the fundamental phenomena of interaction involving children with SSPI and moderate intellectual disability (as in article 3) are to my knowledge extremely rare.

As mentioned, the studies of communication disorders are diverse. Still, they are unified in their ambition to investigate how interaction is organized where participants suffer from communicative impairments. They are unified in their aim at describing how the participants accomplish a common mutual understanding. For instance, the studies referred to above, some of which are described shortly below, have shown how crucial the feature of sequentiality is in interaction. As an example of this, Bloch and Wilkinson (2004) delineated interactions between two women with dysarthria resulting from motor neuron disease and their spouses. The women mainly used speech and natural gestures but also an orthographic input/voice output AAC system. The authors found that understanding in conversation involves more than just

understanding the meaning, grammar, or phonetic signal of the turn itself. Even if the turn is intelligible, it is not certain that it is understood because understanding also involves the sequential position, that is, how the turn is constructed in relation to the prior talk (Bloch & Wilkinson, 2004).

In another study, also related to the sequentiality of interaction, Collins (1996) explored referring expressions. Interaction between persons with SSPI and their carer, friends and family was examined. The persons with SSPI augmented their communication with low technology communication aids with Blissymbolics or high technology communication aids with Minspeak icons. Collins found that referring expressions play an extensive role. They were not only used as clues in the construction of a referent, the sequential placement of the referring expressions was also used in various ways. One way was to describe the relationship to other surrounding talk or conduct. The word 'sun' was placed immediately after the last word of the speaking co-participant, in this case the word 'window'. It was then understood to mean that the sun was coming through the window. Another way was to carry out various activities such as answering a question and changing the topic (Collins, 1996). Persons using AAC systems commonly do not have the means to convey pragmatic aspects of the interaction as 'by the way' or 'well' for instance. Collins argued that the referring expressions may provide an alternative resource for doing this. Thus, for lack of other means, the referring expressions and their sequential placement may be used for a variety of things (Collins, 1996).

In other studies, Clarke (2005) and Clarke and Wilkinson (2007, 2008, 2009, 2010) explored conversations between three children using voice communication output aids (VOCA) and their peers. Clarke (2005) studied both features of VOCA use and the use of vocalisations and 'non-verbal' actions. He delineated different organizational features of VOCA use such as VOCA use as a second pair part and the orientation to the delayed progressivity. He also studied unilateral initiated VOCA mediated turns and the problems they can pose. Vocalisations and 'non-verbal' actions were found to be used, for instance, to signal yes/no and to start and end VOCA mediated turns. The sequential placement of vocalisations and 'nonverbal' actions were also found to determine how the VOCA user was to be understood with respect to the VOCA mediated turn or other talk in progress.

The work by Clarke (2005) and Clarke and Wilkinson (2007, 2008, 2009, 2010) is of special interest to the study at hand. This is due to the fact that they are CA studies of children with SSPI. Furthermore, these studies focus on similar phenomena although the children in the studies by Clarke (2005)

and Clarke and Wilkinson (2007, 2008, 2009, 2010) use high technology communication aids whereas in the present work the children use low technology communication aids. In article (2) of the present study, turn transfer is in focus. Clarke and Wilkinson (2010) who studied children using VOCAs and their peers also examined how the children can be engaged in the organisation of turn transfer. As a response to a prior turn, the transition space can be occupied with visible activity in VOCA operation and audible ‘bleeps’, so-called pre-beginnings (Schegloff, 1996) (for further description of pre-beginnings, see article (2)). The peer in the study of Clarke and Wilkinson (2010) was also seen to orient towards the VOCA in these instances. Hence, the participants were both orienting towards the VOCA. So, for instance, the communication partner was observed waiting in silence while the child using the VOCA was preparing his utterance. In these instances the delay was not treated as a problem as delays may be in ordinary interaction (Heritage, 1984a). Clarke and Wilkinson also investigated some instances where the delay was seen as a feature that was oriented to when children talk. The pre-beginnings were found to be vulnerable to co-occurring talk, and this talk was designed to facilitate the turn transfer by giving the VOCA user a possibility to produce a turn that demanded less work. Clarke and Wilkinson also found that when VOCA mediated turns were initiated as first pair parts, the speaking peers may try to explicitly establish the possibility whether the child using the VOCA is doing a pre-beginning or not (Clarke & Wilkinson, 2010). Regarding pre-beginnings, resources and methods to accomplish pre-beginnings with a communication board will be explored in article (2).

2.4 Diagnoses of the children

As already mentioned, the informants in the thesis are children who have specific problems – impairments - which entail diagnoses, medical diagnoses, and/or other diagnoses (for a definition of impairment and disability, see section 1). The diagnoses become a structuring factor in the children’s social lives. As a speech and language therapist, I have come in contact with the children due to their impairments (and diagnoses). Therefore, I want to give a brief description of the diagnoses that are relevant to the children although in CA it is not normally done. It should be pointed out that the analyses in the articles and the overall aim of the thesis are not to respecify or validate the diagnoses but to scrutinize how these children achieve shared understanding. Thus, once the children have been chosen, the following investigation of the interaction has been executed in an unmotivated way.

The relevant diagnoses will be described shortly below. Note that these are general descriptions and do not give a detailed description of the individual.

2.4.1 Severe speech and physical impairment (SSPI)

The children in the present study have a severe speech and physical impairment (SSPI) (Ferm, 2006). As the term says, both speech and physical skills are affected. These impairments may be caused by cerebral palsy as is the case in the present work. Speech may be affected in various ways, from light dysarthria (articulation difficulties) to anarthria (inability to produce speech, no functional speech). Severe speech and physical impairment here means that the person does not have a functional and intelligible speech. Problems with receptive language as well as the production may arise. The physical impairment is so severe that the person is dependent on a wheelchair for mobility and that s/he is unable to drive his/her own wheel chair.

2.4.2 Cerebral palsy

Many persons who use AAC belong to the group that has cerebral palsy. As do the children in this thesis. They have cerebral palsy, dyskinetic syndrome. Cerebral palsy is a medical diagnosis. It describes a group of disorders of the development of movement and posture, causing limitations in activity. Cerebral palsy results from damage in the developing brain and can occur before birth, during birth or after birth up to the first 2 years of life (Koman, Pateron Smith & Shilt, 2004). The impairment is non-progressive and permanent. The physical impairments of cerebral palsy are often accompanied by impairment in sensation, cognition (cognition defined as an individual skill – my remark), communication, perception, behavior, by epilepsy, and secondary musculoskeletal problems (Rosenbaum, Paneth, Leviton, Goldstein & Bax, 2006). Cerebral palsy is manifested in a range of symptoms depending on the magnitude, extent, and location of the brain damage, and the group is thus heterogenous. The symptoms encompass a span from subtle motor impairment to involvement of the whole body. Approximately 25 % of the group cannot walk, and 30 % have an intellectual disability (for a brief description of intellectual disability, see section 2.4.3). Additionally, around one third of the group has epileptic seizures (Definition and Classification of Cerebral Palsy, pp. 1–44, 2007; Rosenbaum et al., 2006; Koman et al., 2004).

The prevalence of cerebral palsy is considered to be around 2-2.5 per 1000 live births (Definition and Classification of Cerebral Palsy, 2007; Nordmark, Hägglund & Lagergren, 2001). The classification of cerebral palsy is based on

clinical signs divided into three syndromes. These are (1) spastic syndromes including hemiplegia, diplegia, and tetraplegia. Other syndromes are (2) atactic syndromes including atactic diplegia and simple ataxia and (3) dyskinetic syndromes including dystonia and choreoathetosis (Definition and Classification of Cerebral Palsy, 2007).

Dyskinetic syndrome is characterized by involuntary, uncontrolled, distorted voluntary movements. The muscle tone is varying. Dystonic cerebral palsy is characterized by fluctuation of muscle tone and abnormal postures due to the condition. Choreaathetosis is dominated by involuntary and distorted movements (Definition and Classification of Cerebral Palsy, 2007).

2.4.3 Intellectual disability

One of the children in the thesis has, apart from the severe speech and physical impairment, a *moderate* intellectual disability (for a definition of disability, see section 1).

Intellectual disability is caused by a deficiency or damage in the brain that occurred before 16 years of age (Bakk & Grünewald, 2004). It is characterized by significant limitations both in intellectual functioning and adaptive behaviour. A person with an intellectual disability takes a longer time to learn, and the development stops at an earlier stage than for persons with typical development. The intellectual disability can be described using functional stimulus classes: experiences of time, quality, space, quantity, and cause (Granlund, 1991; Kylén, 1981). An individual can experience a light, moderate, or severe intellectual disability. Intellectual disability leads to varying handicaps and limitations of functioning depending on the context of the individual's environment. A person with a moderate intellectual disability commonly has difficulties with abstract concepts and thoughts. S/he also has difficulties with generalization. Therefore, s/he may need to learn to cope with each situation separately. S/he may understand the world as a whole and may only remember things that s/he has experienced herself. Words may be understood in a concrete manner. When the word 'mother' is mentioned, for instance, it is often understood as 'my mother' from that person's point of view. A moderate intellectual disability corresponds to an intelligence quotient (IQ) between 20-49 (Bakk & Grünewald, 2004; Kylén, 1981).

3 METHODOLOGICAL PART

3.1 Participants and settings

In line with my argumentation regarding presentation of information about the diagnoses, I will present some background information about the participants (see section 2.4). The background data have, however, as noted above, had no influence on the analyses as such.

3.1.1 Children

One piece of information about the participants that has been provided, amongst others, is the fact that they are children. Another is that they have several impairments (see section 2.4). A reason for this selection of background information is that these social categories occasioned the childrens' attendance at a special school-unit. As a speech and language therapist, it is in these environments that I have met them.

Another reason why the impairments are accounted for here is that I have a hope that readers other than people who know CA, for example, parents and professionals in the clinical and research field of AAC, will read the thesis and will be able to relate the described patterns of interaction to other interaction they have experienced.

The participants attend a regional school unit in a fairly big city in Sweden. It is a school unit for pupils with physical disabilities, often accompanied by other disabilities, e.g., severe speech impairment, intellectual disabilities, and/or visual impairments. The school unit is specialized in AAC and Blissymbolics. It is located at an ordinary school where the ages range from 6 to 16 years, from preschool/kindergarten up to ninth grade.

The following background information about the children is provided by 1) the current treating speech and language therapist at the school who has also collected information from the journal. The information is furthermore gained through interviews conducted by me. The interviewed were the parent/-s and the speech and language therapist of the children. For these interviews, parts of the Social Networks material (Blackstone & Hunt Berg, 2008) were used.

3.1.1.1 Magnus

Magnus is a boy of 8;6 years of age at the time of the recording. He has a severe speech and physical impairment due to cerebral palsy, dyskinetic syn-

drome. He augments his communication with Blissymbolics on a communication board. He has no ability to drive his own own wheel chair and no functional speech. At the age of six, Magnus's language comprehension was found to be on an age adequate level for Swedish. Persian is spoken at home. Magnus's intellectual capacity was found to be on an average level. Magnus has augmented his communication with a communication board with Blissymbolics for more than five years (McNaughton, 1985). There are 584 bliss words on his communication board. Magnus uses 'direct selection' with a light pointer attached to his glasses.

3.1.1.2 Maria

Maria is a girl of 10;4 years of age at the time of the recording. She has a severe speech and physical impairment and moderate intellectual disability due to cerebral palsy, dyskinetic syndrome. She has no ability to drive her own wheel chair and no functional speech. Maria was assessed as having a moderate intellectual disability almost one year after the time of the recording. Her speech and language therapist reported that she had no certain language comprehension on a one-word level. Swedish is spoken at home. Maria's mother reported that Maria uses body movements, vocalizations, and sometimes Blissymbolics. She has been exposed to Blissymbolics for four years. She indicates the symbols with her fist/hand. Her mother reports that Maria indicates one alternative out of two when the communication partner puts two hands in front of Maria.

3.1.1.3 Bert

Bert is a boy of 11;10 years of age at the time of recording. He has a severe speech and physical impairment due to cerebral palsy, dyskinetic syndrome. He has no ability to drive his own wheel chair and has no functioning speech. His language comprehension is assessed to be on an age adequate level. Swedish is spoken at home. Bert augments his communication with Blissymbolics and he has a communication board with 523 symbols. He has been exposed to Blissymbolics for four years. Bert indicates his symbols by direct selection with his index finger (for more background information of the children, see appendix).

3.1.2 Everyday communication partners

Other people, adults and one child, are part of this study as well, as they participated in interaction with the children who were video-recorded. These were the following.

Magnus interacted with his

- 1) mother 2) father 3) friend and 4) assistant at home.

Maria interacted with her

- 1) mother 2) grandmother 3) grandfather and 4) special education teacher.

Bert interacted with his

- 1) father 2) mother and 3) special education teacher.

In the data there is one instance of interaction between Bert and Magnus (not analyzed in the presented articles). The interaction is interpreted/supported by an assistant at school (see appendix for more background information about the communication partners of the children).

3.2 Settings

The participants were filmed in several naturally occurring settings, at home and at school (see table below for overview of the settings).

Table: Person, setting and communication partner. ‘T’ indicates that the data have been transcribed and the number of minutes. ‘Cbd’ indicates that the interaction is augmented by a communication board. ‘No cbd’ indicates that the interaction is not augmented by a communication board. ‘Computer’ indicates that the interaction is augmented by a computer.

Child	Situation/ communication						
	partner 1	partner 2	partner 3	partner 4	partner 5	partner 6	partner 7
Magnus	Home/ mother+SLT/ conversation <i>T=2 min cbd</i>	Home/ personal assistant/ conversation <i>T=2 min cbd</i>	Home/father +assistant/ negotiation <i>T=2 min no cbd</i>	School/ friend/ schoolwork <i>T=2 min computer</i>	School/ friend/ conversation <i>T=2 min cbd</i>	Home/ mother/ conversation <i>T=2 min cbd</i>	School/ friend, aac/ conversation <i>cbd</i>
Bert	Home/mother/ conversation+ reading book <i>cbd</i>	Home/father/ chatting/ conversation+ book <i>T=2 min cbd</i>	Home/father+ sister/reading book <i>T=2 min cbd</i>	School/ assistant/ conversation <i>T=2 min cbd</i>	School/friend, aac/ conversation <i>cbd</i>		
Maria	Home/ mother/baking <i>T=10 min no cbd</i>	Home/ grandmother/ looking at photos <i>T=3 min no cbd</i>	Home/ grandfather/ singing <i>T=2 min no cbd</i>	School/special education teacher/ pedagogical interaction <i>T=10 min cbd</i>	Home/ grandmother+ SLT showing Bliss-board use <i>cbd</i>	Home/SLT+ mother/ coffeetime <i>T=4 min no cbd</i>	

3.3 Data collection - Procedures

Inclusion criteria for the study were severe physical impairments with no ability to drive own wheel chair and no functional speech (i.e., SSPI). The informants should have been exposed to Blissymbolics for several years.

All informants and their families at the school unit suiting the criteria were asked to participate, five in all. One family declined and one was in the end not asked, due to absence from school. Three families agreed to participate. Eventually, the articles in the present thesis focused on data from two of the children, and data from the third child have been used as material for comparison.

The children and their everyday communication partners were informed of the study orally and in writing. They were asked to participate in the study in an admission letter (informed consent) in which the study was described to focus on conversation and interaction with children who use AAC modes like eye-gaze, vocalisations, manual signs, and Blissymbolics. The letter was given to the children and parents by me or by their current speech and language therapist, and, in one case, the letter was interpreted by a professional interpreter. After the parents agreed to participate, the children were asked for participation in a letter written in ordinary orthography and Blissymbolics (see section 3.3.3, Ethical considerations).

When preparing the video recording for this study, the parents were asked to think about situations that occur in everyday life when their child communicates a lot. The reason for this instruction was my membership knowledge. I know that the interaction between the children and others can be sparse. In the interactions between the boys, the participants were asked to talk as they always do about any topic they wanted. Also, regarding the video recordings with the girl, the participants were asked to do an ordinary activity, in which they felt that they had 'good contact' with the girl. Again, I gave this instruction because of my membership knowledge that a child with SSPI can look at what is going on and, still, not interact much. This instruction was given in order to get video recordings with much activity and interaction with the girl. The special education teacher was told to act in the way she used to. The children and the assistant were asked to talk as they always do about any topic they wanted. One interaction between an assistant and Bert was filmed in the school corridor.

As mentioned, I knew the children from the school in which I had been employed as a speech and language therapist for a long time. Hence, the participants all knew me (except for Maria's grandparents and Magnus's assistant

at home). The setting was discussed with the parents/teacher and the participant. In a few cases I stayed for a while and participated in the interaction or came back and participated at the end of the recording. The parents were told that they could turn the camera off whenever they wanted.

All data mentioned above are ‘naturally occurring’ data, not elicited, except for one video recording with Magnus in interaction with a talking schoolmate. The interaction between Magnus and his schoolmate is elicited in the sense that Magnus was asked who he wanted to chat with, and he came up with a friend from his class. The teacher and the boy’s assistant stated that Magnus often interacts with this friend. For the purpose of studying the interaction of users of AAC modes communicating with each other, I have also elicited data where the two participating boys, Magnus and Bert, are chatting with each other with the help of a personal assistant. The two boys were told they could talk about anything. The reason for eliciting these data was that I, as a speech and language therapist, know that interaction between persons with SSPI and peers does not often occur naturally.

3.3.1 First visit

On the first visit the parents and I talked about the focus and the procedures of the study. Information was given about the aim of the study which was to study what was actually going on, in detail, to do a microanalysis of the interaction, and to study multiple resources used. On this first visit, the parents were also interviewed, as noted above. The information that was collected from the interviews was only used as background information, in accordance with the tradition of research in the field of AAC (see section 3.1.1 and the appendices).

3.3.2 Second and third visit

I visited Magnus three times at home. The video recordings were made at my second and third visit. Bert was visited twice at his mother’s house and twice at his father’s house. The video recordings were made on the second visit. Martha’s home was visited twice, and the recording was made on the second visit at both homes. In Martha’s case a video recording was also made at the grandparents’ home. Finally, the children were also video recorded at school, in different naturally occurring settings, interacting with the assistant, a friend, a non-speaking friend assisted by an assistant, with a special education teacher, and in a conversation group for children who use Blissymbolics, administered by two speech and language therapists at the school.

Due to the richness of the data and the lack of visibility and audibility of the participants in some video recordings, all parts of the data were not analyzed. The interaction or parts of the interaction that were not used for analyses in the thesis were used as reference data (see section 3.5).

3.3.3 Ethical considerations

The project (no: 2009-61) was approved by the Regional Ethics Board in Lund, Sweden on February 10, 2009 and of the Danish Data Inspection Board in March, 2009. The participants and their families were informed of the aim and method of the project in writing, orally and in the children's own communication mode, Blissymbolics. The participants were informed that their participation was anonymous and that they could withdraw from the project whenever they wanted. The parents and the children themselves signed a letter of agreement. The friend and her parents were informed orally and in writing. They signed a letter of agreement. The school staff was informed about the project in writing and orally on several occasions. The school staff and the assistant at home have given their informed consent.

3.3.4 Video recordings

Data have been recorded by video and audio. Three cameras mounted on tripods were used. The audio was also recorded with the cameras' internal microphones and a recorder with mp3 format. The mp3 was lying on a table close to the participants. The cameras were located at different distances and at different angles from the interaction. They were installed in one room and located so that most of the interaction would be captured. At Magnus's home the cameras were set up in the living room. At Bert's home the cameras were set up in the living room and in the kitchen. At Maria's home the cameras were set up in the kitchen and by the dinner table. At Maria's grandparents' home the cameras were set up in the living room. At school the video cameras were set up in a classroom. One instance was filmed in the hallway. The camera was turned on and the researcher left the room. The cameras were very much in sight, and sometimes they were the topic of the conversation. Although three cameras were used, all details in the interaction were not captured, for example, the indicated bliss symbol was frequently not captured on video, only the area of the topic. This is due to the fact that the participants moved and because they chose their interactional positions themselves.

Each child was filmed on several occasions. In total Magnus was filmed for 4 hours, Bert for 3,30 hours, and Maria for 2,30 hours.

3.4 Transcription process

3.4.1 Representation of data - transcription

The data in this thesis consist of video recordings. In CA, the video or audio recordings are always regarded as the core data. However, there is a need to represent the data so you can analyze or rather ‘freeze’ the time and make interactionally relevant conduct observable. Moreover, to be able to analyze the data in ways that fall within CA research interests, the data must be represented in a detailed transcript.

Of course, a transcription is a way of visualizing on paper what is going on in the recording. However, it is important to be aware that it is not possible for a transcript to represent the recordings completely. In addition, a transcript cannot be neutral. No transcription system can claim to capture all observable features of interaction (Hutchby & Wooffitt, 2008). Still, transcripts are an essential part of CA research. It gives the reader a possibility to observe for him- or herself the data and check the analysis presented. This is normally not possible within quantitative research methods. Generally, transcriptions are produced using various conventions according to different theoretical and methodological biases and are governed by the goal of the research at hand (Ochs, 1979). Common to all CA transcripts is, however, the interest in demonstrating sequential phenomena. That is, the transcription represents the participants’ temporal actions in relation to each other. Until recently, the transcriptions have mainly focused on spoken interaction, and the transcription conventions have evolved accordingly. These transcripts include talk, pauses, inbreaths, prosody, and laughter, for example (Jefferson, 1985). Lately, however, phenomena other than talk, such as visible bodily action, have also become the scope of investigation. A need to develop the transcription conventions to include both spoken and visible bodily action has emerged (Goodwin, 2000; Martin, 2004; Mondada, 2006; Ochs, 1979; Streeck, 1993).

According to Ochs (1979), traditionally there are several biases when producing a transcript. For instance, the layout of the page is typically the western layout, from top to bottom and from left to right (Ochs, 1979). ‘Non-verbal’ behaviour is commonly placed between brackets below the verbal action, possibly implying that these actions are less important. A practical consideration is that when including visible bodily action in transcripts, it takes more space to represent bodily action than speech (Ochs, 1979). There is also a bias towards English-speaking readers. English dialogues are frequently written in ‘spoken’ form which can be difficult to read for non-native English speakers.

3.4.2 Representing the data of the present thesis

Since one of the participants in each interaction is not able to speak, the bodily actions and vocalizations play a prominent role in the conducted interaction (von Tetzchner & Hygum Jensen, 1996). It is essential that the transcripts reflect this feature. As noted above, the inclusion of multimodality in the transcript raises a need for transcribing more details of visible body movement.

In order to make high quality transcriptions, there are several factors to consider. According to CA transcription standards, the transcription should:

- Capture all interactionally relevant action. A main concern in CA is to capture the dynamics of turn-taking. Beginnings and endings of turns are transcribed, including overlap, gaps, pauses, and audible breathing (Hutchby & Wooffitt, 2008). Transcriptions also include characteristics of speech delivery, e.g., stress and pitch (Hutchby & Wooffitt, 2008). All details may be of relevance (Drew, 2005). However, it may be difficult to assess beforehand whether conduct is interactionally relevant or not.

- Be transcribed in an unmotivated manner. This is one of the main methodological points of CA (see section 2.3). CA is an inductive research method. No predefined categories are used.
- Represent the data in a faithful way. In high quality research it is crucial that the data and method are transparent (Drew, 2005; Hutchby & Wooffitt, 2004).
- Be possible to show the transcript to others, without putting too much energy into explaining your transcription conventions (ten Have, 1999).
- Be produced in a manner that presents the analytic points so that the reader may follow the argument that is brought forth in the analysis (Martin, 2004).

3.4.3 Transcription process

Generally, during the research process, transcripts may take different shapes depending on where you are in the analytical process (Martin, 2004). This was also the case in the present work. It has undergone a continuous process. The transcription process started with my looking at the video recordings several times. I immediately realized the need to transcribe several visual bodily actions including vocalizations and pointings at a communication board. It may be argued that I have then used predefined categories in the transcribing process which is not in congruence with the notion of ‘unmotivated looking’ at the transcribed data. Instead the ‘unmotivated looking’ took place before

the transcription process. Furthermore, since there was a need to transcribe the visual bodily action, it was necessary to label these actions in some way. So, I started off drawing on the categories used by Månsson (2003):

1. talk, vocalizations: spoken words or vocalizations, e.g., eeeeh
2. gaze direction: e.g., Magnus's gaze direction at his friend
3. facial expressions: e.g., a smile or opening of mouth, a head shake
4. head movements: for example, a nod or a shake
5. arm and hand movements: e.g., the arm hits the table
6. other body movements: e.g., a movement of the torso or the leg

In addition, another category, an indication/a pointing at a bliss symbol on the communication board was transcribed. When the video recording shows the child pointing with his/her lightpointer at a symbol on the communication board, the location on the board is noted but not always the symbol itself. Sometimes the speaking communication partner voices the word, but it is not clearly seen on the recording by the analyst. In these cases it is considered evident what the child is pointing at, and the word is transcribed but put between brackets.

The categories were presented on different tiers with talk/vocalizations on top.

After discussions with my supervisor, G. Rasmussen, and J. Wagner and B. MacWhinney (personal communication, 23 September, 2009), the CLAN software (MacWhinney, 2000) was employed. At that time I also started to bring my data to data sessions in Denmark and later in London. When I presented my data, there constantly arose a need to explain the transcription before people could look at the actual data. This took valuable time from the data sessions. As a consequence of the difficulties of explaining the transcription conventions, I started to present my data in a more traditional CA manner. The bodily actions were presented in brackets below the talk if there was any talk. Article (1) is an example of this. The focus of article (1) is on how the participants organize CB-mediated turns and on the feature of voicing and thereby overt co-construction of the emerging turn. The traditional CA transcription was well suited for this analysis.

Article (2) and (3) scrutinize bodily action and vocalizations as resources in interaction. Again, a need arose to transcribe and represent my data in more detail to present the relation between bodily action and spoken action, and the relation between different bodily actions -- as accurately as possible -- and in relation to time. In order to meet those demands, multimedia an-

notator ELAN (<http://www.mpi.nl>) was chosen as a complement to CLAN. An ELAN transcript is time-based and horizontally presented. Hence, it can present all actions in relation to each other in time. I continued to use the same categories as before.

When I started to write and present articles, I realized that ELAN transcripts were not considered to be easily read by people in the CA community. At this time, I complemented the ELAN transcripts with traditional CA transcripts. Article (2) and (3) are transcribed using both CLAN and ELAN.

There is a continuous dilemma in the transcription process, when striving for a balance between simplicity and detail always is at the forefront (Martin, 2004). As an example of this, in order to make the representations more accessible for readers, I began to make drawings from certain instances after feedback from several experienced CA researchers. The drawings were traced from frame grabs of the video recordings. They were traced by hand and scanned. Sometimes an arrow or a circle was added in order to focus the reader on specific features. The reason for using drawings instead of photos were ethical. It was crucial that the data used here were anonymous. Both article (2) and (3) include CLAN transcripts, ELAN transcripts and drawings.

‘Readability’ is a term that is frequently used when discussing presenting data that is readable and thereby accessible to others. In my experience, a non-traditional transcript is at times considered to be unreadable among CA researchers. It can be questioned if this is something that has been scrutinized or not. It is possible that, if you are used to one transcription convention, you often think that other conventions lack readability. It may also depend on what research interests the researcher has had. If the focus has been on talk, then the traditional transcription conventions are well suited and well known in the CA community. However, as noted above, at present, CA studies have enlarged their scope to include more visual bodily action, and, therefore, a need has arisen to transcribe in ways that encompass multiple interactionally relevant resources. Thus, a natural consequence is that new transcription conventions develop.

3.4.4 Glossing/translation

The participants speak Swedish and sometimes Persian. These languages have been translated into the equivalent English expression on the tier below, relying on my competence in English and the contextual understanding of the setting. The Persian was translated by an authorized interpreter and written in Latin orthography.

In order to save space and not to put the focus on syntax, there is no tier with the exact syntactic translation.

3.4.5 Description of visual bodily action

Visible bodily actions are noted in English. The fact that the participants have the diagnosis of Cerebral palsy may entail involuntary movements. Thus, it is not evident if the bodily actions are voluntary or involuntary movements. As mentioned above, there exists no neutral transcript (Hutchby & Wooffitt, 2008). During the transcription process and, especially, when transcribing visual body movements, I have become more and more aware of this. Wordings imply more or less interpretation from the analyst's part. For example, there is a difference between 'the head wiggles' and 'Maria wiggles her head'. In the latter case the transcriber interprets the body movement to be more active/conscious. There is also a difference between 'sigh' and 'audible outbreath'. The first case may be interpreted as being a more interactionally relevant act than the latter. Thus, the wording may have consequences for the analysis, and there should be some caution. The relevancy is for the participants to decide, and it is shown in the data whether the participants orient to the conduct/action or not. In order to transcribe in a neutral way, not implying my own interpretation, I have tried to choose a neutral wording as frequently as possible. Hence, in most cases, the wordings 'the head wiggles' and 'audible inbreath' have been chosen.

3.5 Analytic procedures

Since the method of CA was chosen, the analytic procedures followed the principles of CA. For a description of CA, see section 2.4. Below follows an outline of the analytic work on the data.

The video recordings were looked through several times by the author. Transcriptions were made where the data were possible to transcribe. Sometimes the surrounding noise (another conversation occurring very close to the camera) made it impossible to transcribe the data. In total approximately 46 minutes were transcribed in detail (for a description of the transcription process, see section 3.4.3).

From the data on Magnus and Bert and their everyday communication partners, I transcribed when there were exchanges of 'talk', similar to ordinary conversation. I did not transcribe when the participants were solely reading a book together, for example. In the data where Maria and her everyday communication partners were represented, instances were transcribed

where some kind of action occurred that appeared to be responded to by the other person.

The data and the transcriptions were shown several times at data sessions organized at the Center for Social Practices and Cognition (SoPraCon), the department of Language and Communication at the University of Southern Denmark. In addition, the data have been shown at data sessions at various courses and master classes attended by researchers in the same field. When analyzing data in CA, **data sessions** play an important role. They can be regarded as the CA equivalent to the interrater agreement of other paradigms. Data sessions are meetings with a group of colleagues and researchers. They commonly follow a similar routine. After a brief introduction to the setting by the 'owner' of the data, the group works together to collectively analyze the film. First, the participants look at the video and transcription. A fragment of the data is chosen for closer viewing. Second, the participants look at the chosen video clip over and over again. Third, everybody reflects by himself/herself for about ten minutes. The participants are not looking for anything in particular. This is called **unmotivated** looking. Finally, the data session finishes with a round, where every participant delivers some kind of analysis or some observations. A ground rule is that the participants are free to bring up anything they like, but it is required that the participants ground their observations from the data at hand (ten Have, 2007). The findings may also be supported by reference to other data-based findings or published findings in the literature. Generally, the participants come up with an object for the research and research questions in cooperation. The discussions are recorded on paper or tape and later used as a resource for the in-depth analysis. Data sessions have a duration of about 1,5-2 hours (ten Have, 2007).

After the unmotivated looking, the rigorous analysis began. (It had already begun during the transcription, but now I began to write it down.) At the data sessions, certain phenomena stood out as occurring in a systematic, recurrent, and, thus in a recognizable manner. These were a) how the participants construe a turn b) the participants' employment of resources and methods to manage turn-taking and c) the creation of meaning through the coordination of gaze and arm/hand movement. The succeeding research process focused on these themes. The richness of the data entailed that article (1) and (2) were produced investigating and analyzing patterns of interaction between one of the boys, Magnus, and his everyday communication partners. One article (3) was produced elucidating patterns of interaction between the girl, Maria, and her everyday communication partners. The interaction

between the other boy, Bert, and his everyday communication partners was used as reference data to the phenomena found in the other analyses.

Firstly, detailed **sequential analyses** were conducted. Elements of turns and turns as oriented to by the participants were identified. Based on the sequential analysis organizational patterns were described. The descriptions included the resources and methods which were deployed. Secondly, references to other research findings were made. Thirdly, the analysis discussed what was being accomplished by the use of these organizational patterns. Several different cases and so-called deviant cases were analyzed and compared to the other cases/patterns. A deviant case is a case in which a proposed regular phenomenon or practice is not implemented. The analysis of an organizational pattern is considered to be strengthened when it includes an analysis of a deviant case (Hutchby & Wooffitt, 2008).

3.6 Validity

The population of AAC is heterogenous regarding capabilities and degrees of impairments (Pennington et al., 2007). Therefore, it is essential to be cautious of generalizing the findings of the present thesis to interaction with other persons with SSPI. When reading the present work, the general assumption should be that the findings show specific organizational patterns with specific features that may occur in interaction between children with SSPI and their everyday communication partners. It is not claimed that they always occur. Other organizational patterns may also be observed. What is claimed, or rather documented, is what they look like, that is, what the features of ordered actions are *when* they do occur.

Several features add to the validity of the present work. First, the study is based on naturally occurring data. This makes the findings more valid than if the findings would come from, for example, interviews or from controlled experiments which are based on the analyst's assumptions about the world (Heritage, 1984a). The fact that the interaction has occurred in real life gives the data high validity in general. Moreover, the emic perspective in CA adds validity to the findings (Silverman, 2008). In using the '**next-turn-proof**' **procedure** (Hutchby & Wooffitt, 2008), the analyst makes sure that the finding is based on how the participants treat and understand the previous action. This understanding is displayed in the next turn. Hence, the displayed understanding is used by the analyst and provides visible and intrinsic validity to the claims made by CA. Thus, how the previous turn is understood by the co-participant in the next turn gives proof of what action it accomplishes. Hence,

the understanding of the turn is not inferred by the analyst.

In the three articles analyses of deviant cases have also been conducted. As already mentioned above, this may also strengthen the validity of the analyses in the study.

Finally, in order to assure the most possible transparency of the analysis, the transcripts of chosen excerpts are displayed in the articles. The analyses are presented so that the reader can see how the analyst has reasoned and agree or disagree with the analysis. By making the analytic process transparent the validity is strengthened (Silverman, 2008).

Of course, the validity may also be affected in a negative manner. Since I am the children's former speech and language therapist, I may affect the use of the communication board. It is possible that the adults have perceived the study to aim at recording interaction with only the communication board because the underlying assumption in intervention is that the child should use the communication board as much as possible. However, when the participants were informed of this project, the multimodal aspect was emphasized, and it was stressed that they should interact as they normally do. The data that have been collected show a blend of situations where the participants sometimes use the communication board and sometimes not. This indicates that the participants were not particularly influenced by the fact that I was their former speech and language therapist.

3.7 Reliability

Questions can be raised about the reliability of the findings as well. Some reliability issues are discussed below.

3.7.1 Observing interaction

When attempting to explore interaction, the video recording may in itself have an effect on the data. The presence of the video cameras and sometimes the presence of the researcher may have affected the participants' behavior in different ways. The video recording is, however, the closest you can get to naturally occurring data. But, as indicated above, one should be aware of Labov's 'Observer's paradox' (Labov, 1972, cited in Davies, 2001). It is based on the idea that the observer may influence the data by being present. The paradox is that it is impossible to observe and get natural data at the same time. Also, if the observer is not present when the data are recorded with cameras, the camera may still be perceived as an observer and influence the behavior. If the camera would be hidden, the data would probably be more natural, but then

there would be an ethical issue which makes it an impossible option. The data that are filmed with cameras the participants are aware of are therefore the closest you can get to natural data (Goodwin, 1981).

As a clinician, with many years of experience of this kind of interaction and a certain amount of membership knowledge, I do not find that the data I have collected by observations and through video recordings differ from what I am used to observing. Besides, my experience is that children often forget about the camera after a while. Magnus might have an awareness of the camera as he is expressing more advanced multi-element units than he usually does according to my clinical experience. The two other children do not seem aware of the camera at all. The adults on the recordings may be aware of the camera, at least in the beginning. However, when considering the fundamental interactional phenomena that are being examined in the present study, it seems less plausible that the presence of the camera would influence these. This is supported by Goodwin (1981).

In addition to the above, issues about the trustworthiness of the transcription can be raised. Several transcriptions have been shown at data sessions among fellow colleagues and PhD-students. The participants have had the opportunity to agree or not with the transcripts. Despite this indication of reliability, one should, of course, as a principle take into account that a transcript is always an interpretation of the data and that the video recordings are the primary data. However, Silverman (2008) argues quite the opposite when he suggests that the level of detail in CA transcripts results in a more objective representation than in other research and that this fact entails a resolution of the problem of inter-coder-reliability (Silverman, 2008).

3.7. Researcher's influence on the analysis

“No act of observation can be free from the underlying assumptions that guide it.” (Silverman, 2008:221). This is important to think of and to make efforts to minimize.

My membership knowledge, due to my work with children with disabilities, might influence the way the data are being analyzed. At a certain stage of the analysis, the first one, you should try to distance yourself from it, and at the last stages you should let your membership knowledge influence your analysis. However, the data have been viewed on several occasions, in data sessions, together with experienced researchers in CA who do not have a bias towards communication impairments. The themes that have been explored have been salient and brought forth by the participants in the data sessions.

What also adds to the reliability is the fact that this study investigates interaction between the children and several everyday communication partners: the mother, the assistant, the friend, the grandmother, and the special education teacher. Previous studies have commonly been conducted on interaction with only one speaking communication partner. The communication partner has often been a professional, for example a speech and language therapist or a teacher. The analysis becomes more robust if the same patterns are found in interaction with several everyday communication partners. Moreover, the video recordings have in several instances been made during a two month period, both at home and at school. This also adds validity to the patterns described.

4 DISCUSSION AND FINDINGS

4.1 Discussion of thesis

4.1.1 Discussion of research method

As noted above, the present study applies to CA in a field that is traditionally studied through a quantitative research approach (Clarke, 2005; Higginbotham et al., 2007). The focus of the traditional approach is on individuals and their behavior in isolation from the other interactant's action. In contrast, the CA microanalytic approach looks at the whole process of interaction, involving both the person with SSPI and her/his communication partners. Within the traditional research field of AAC one may then wonder about the contribution of the CA approach. Below follows a discussion about the advantages of the research method.

A contribution of CA to the present study is that the analyses of the data at hand focus on the competencies of the participants (Heritage, 1984a). The focus is on how the participants actually fulfil interaction. Since the present study investigates persons who have several kinds of impairments and lack several skills, such as speech and motor skills, it seems to the participants themselves, from a psychological point of view, more positive to look at what they actually do when achieving shared understanding with the available resources and skills than to focus on what they are not capable of doing. The analyses in the present thesis showed the children's and their co-participants' competencies in building up and managing the interaction. It appears that they adapt to the circumstances and collaboratively accomplish shared understanding by organizing the interaction in specific and creative ways. It is important to point out these competencies to the participants who otherwise have a great deal of deficits and impairment to deal with.

Another contribution of employing a microanalytic approach as CA is that it is possible to capture the whole subtle and complex interactional process. Studies on interaction in the field of AAC commonly apply other methodologies and are not able to capture the dynamic process in its depth. Research similar to the present thesis is relatively rare although some exceptions exist, e.g., Clarke, 2005; Clarke and Wilkinson 2008, 2009, 2010, 2011; Collins, 1996; Collins and Markova, 1995; Higginbotham, 1988; Müller and Soto, 2000; and Rae Fulcher and Higginbotham, 2010. By studying the whole process in an inductive manner, multiple resources that the co-participants

orient to as relevant can be explored at the same time. The analysis showed that bodily produced resources as gaze direction in combination with smiles and vocalisations may be used as methods for pre-beginnings and post-completions of CB-mediated turns. What at first sight may appear to be irrelevant conduct for the interaction, to a speech and language therapist, for example, transpired to be a highly significant organizational pattern of the interaction. These insights are crucial for increasing the knowledge of how challenged interaction actually is achieved.

The detailed sequential analysis conducted in CA also offers insights into how interaction is built up and managed step-by-step. The fact that sequences of data are in focus, entails that we observe how actions are treated, understood, and responded to by the co-participant. The analyses demonstrate how the participants collaboratively organize the interaction in specific sequential patterns using specific resources and methods such as gaze direction, vocalizations, smiles and other bodily action in combination with the communication board. This is something that is usually not known on a conscious level to the participants in the sense that it is 'seen but unnoticed'. Therefore, though accomplished by the participants themselves and oriented to, it is difficult for the participants to describe how they go about achieving mutual understanding, for example in an interview. Thus, the sequential analysis gives concrete descriptions of how interaction is conducted that we may not otherwise get insights into. In addition, a sequential and situated analysis adds understanding of the importance of the context and the actions of both the interactants. It becomes apparent that what the first person says and does influences to a high degree what the second person with SSPI will say/act and vice versa.

Apart from contributing to research in the field of AAC, CA may also contribute to clinical assessment. When a speech and language therapist meets a client for the first time, the primary task is to conduct an assessment of the child's (or adult's) communicative ability and communicative situation. The assessment is traditionally conducted by using different tests although assessment methods that make use of video recordings of natural interaction with everyday communication partners have increased recently (e.g., Aarts, 2000; Lock, Wilkinson & Bryan, 2001; Pepper & Weitzman, 2004). The traditional view is the monological view, that is, to assess the individual's ability in, for example, word knowledge and other kinds of expressions, and sentence length, commonly outside of the communicative context (Linell, 1991). The fact that we know that interaction is collaboratively achieved to a high degree, and that it is beneficial to look at the whole process leads to the conclusion

that CA may be considered to be employed in assessment in order to show how the communication disorder may effect the interaction of everyday life (Hutchby & Wooffitt, 2008; Schegloff, 2003; Beeke, Wilkinson & Maxim, 2007; Wilkinson, 2010).

However, if CA is used in assessment, there is an evident risk that the assessment could turn out to be rather time-consuming. A compromise would then be to make video recordings of naturally occurring interaction and employ the findings from similar CA research to make a description of the interaction. The description could comprise resources and methods that the participants use to accomplish actions, such as, 'doing conversation' or expressing 'wants'. For example, the assessment could provide descriptions of how turns are built up, if pre-beginnings and post-completions are deployed, and what they look like in that case. This idea is in line with an intervention program for partners of persons with aphasia called SPPARC: supporting partners of persons with aphasia in relationship and conversation (Lock et al., 2001).

Moreover, the findings of the CA research method also raise questions about intervention studies in the research field of AAC and the issue of defining and measuring intervention outcomes. Outcomes are often defined in quantitative terms as number of communicative initiatives, number of symbols on the communication board that the person knows the meaning of, or sentence length (Wilkins & Higginbotham, 2005). Based on the findings in the present study, instead of looking at the individual's isolated actions and the outcome by the person with SSPI, a possible outcome is to look at how the participants achieve shared understanding in a more efficient way, e.g., how they achieve conversation, or how they achieve intention and create meaning. Relevant phenomena that may be addressed concerns the extent of succeeding in accomplishing turns and agreeing on mutual understanding, as well as the methods used when doing so. Once identified, these phenomena can then be observed and used for longitudinal studies of the development of interactional competence over time. In the same vein, Olsson and Granlund (2003) considered outcomes but with the focus on intervention with persons with severe multiple disabilities. They argued that a desired outcome may be defined as mutually rewarding interaction rather than developing a more complex communication skill. Furthermore, Olsson and Granlund supported the idea of looking at the whole interaction process by suggesting that when looking for the quality of communication intervention for presymbolic communicators the following questions may be asked: Are goals set in terms of changes in participation reached? Do interactional patterns change following

from intervention? What changes in pattern can be observed over time? Are ongoing changes in interactional patterns observed as a function of framing mutually rewarding interactions? Are changes seen in social relationships? (Olsson & Granlund, 2003). Based on the findings of the present study, these questions seem highly motivated in future studies when looking at intervention outcomes.

Above I have mentioned several advantages of using CA. Naturally, questions can be raised regarding limitations in using CA. Obviously, one scientific approach cannot answer all research questions. However, in sum, it is my conviction that the CA approach is well suited for studies of interaction in the field of AAC. It gives important insights into the interactional process that other research methodologies cannot capture.

4.1.2 Comparison of the articles

Different aspects of challenged interaction have been explored in the three papers included in the thesis. In all interactions one of the participants is a child who has SSPI due to cerebral palsy, dyskinetic syndrome. In paper (1) and (2) interaction is explored with the same boy and his everyday communication partners. In paper (3) interaction is explored between other persons, a girl with SSPI and a moderate intellectual disability and her everyday communication partners.

Two of the research questions in the present work are: What kind of actions and activities are the participants constructing? How do they accomplish that? In order to respond to these questions, I will look at the actions being accomplished and compare the actions in the three papers. When comparing the CB-mediated turns in paper (1) and (2) and the turns accomplished without the communication board in paper (3), there is a difference in the actions that are being accomplished and the organization and methods deployed to achieve these actions. The actions achieved by the participants in paper (1) and (2) are requests for information about ‘what food/animals you like’ and the response to a request for information ‘when a person is at the house’. The participants organize the turns that accomplish these actions with one or several [symbol pointing+ voicing] elements. The turns commonly have a pre-beginning and a post-completion. The symbol pointing act, by the child with SSPI, functions as a linguistic building block that is followed by a voicing by the speaking co-participant, and the TCU is collaboratively built up step-by-step. The turn can be said to be invited by the boy with SSPI through the pre-beginnings. The kind of actions accomplished by the child with SSPI and

his everyday communication partners (in paper 1 and 2) can be understood as 'doing conversation'. Furthermore, 'doing conversation' is accomplished by orienting to language and talk as a constitutive feature of the activity of doing conversation. This feature is oriented to by both the participants.

In contrast to the interaction in paper (1) and (2), the actions accomplished in paper (3) are 'wants' (the girl with SSPI wants the strawberry drink, she wants to move the boat, she wants a small communication board, and she wants the bun) and a deictic response to a request for an action (the girl points at a person in a photo album). Thus, the turns of the child with SSPI and moderate intellectual disability in paper (3) differ from the turns achieved in paper (1) and (2). They are not organized in linguistic building blocks and are not built up step-by-step of [symbol pointing+voicing] elements. They also lack pre-beginnings and post-completions. The turns in paper (3) are not used and oriented to as actions for 'conversation' but as 'wants' and pointing actions in object-transfer-interaction (Brouwer, Hougaard & Rasmussen Hougaard, 2008). They are followed by an act by the speaking co-participant that is not floor claiming, similar to the voicing, but this act does not function as voicings do and is not oriented to by the participants in the same manner as the voicing in the turns in paper (1) and (2). The act by the speaking communication partner functions as a confirmation and public understanding of the turn and action, not of the linguistic building block. The meaning is collaboratively achieved, not the turn as is the case of the interaction in paper (1) and (2). Hence, according to the data at hand, different actions were accomplished using different resources and methods.

Apart from comparing the actions that were achieved, a comparison regarding the use of the communication board may be conducted. In paper (1) and (2), the child with SSPI and his co-participants employ the communication board in contrast to the persons in paper (3) where the child with SSPI and her co-participants accomplish shared understanding using other resources. In the video recordings there also exist instances where the boy in paper (1) and (2) does not employ his communication board. In the video recordings with the girl in paper (3) and her communication partners, there are a few occurrences when the participants use the communication board, e.g., with the mother and the special education teacher. However, overall the communication board is employed more frequently with the boy in paper (1) and (2) than with the girl in paper (3). In the interaction with the girl in paper (3) the actions that are achieved are, as noted, 'wants' and a pointing with a deictic function. These actions may be accomplished by the use of other re-

sources than the communication board. This may be one explanation why the communication board is not frequently used. In the interaction with the boy in paper (1) and (2), the participants accomplish ‘conversational interaction’, that is, exchanges of ‘thoughts’. In this case, the need of linguistic resources, as the blissymbolics provide, is more salient. This may be reflected in the extended use of the communication board.

Finally, the use of bodily action and vocalizations can be compared. In paper (2) these resources (exclusive of Blissymbolics) and methods are used to claim and complete a turn in order to make turn-taking possible. The bodily action gaze direction at the communication partner and then at the communication board in combination with smiles are employed to initiate a turn. In some instances the boy gazes directly at the communication board. The turns are completed by gazing at the speaking communication partner and by smiling. The bodily action and vocalizations are in this case employed in concert with the use of Blissymbolics. In paper (3) the bodily action (exclusive of indications at Blissymbols) and vocalizations are used as methods to construct the main content of the turn and action. The bodily action that is employed here is a gaze at an object in coordination with arm/hand movement towards the object. That is, gaze is used in combination with arm/hand movement to construct a ‘wanting’ and ‘deictic’ action. Thus, bodily action and vocalizations may have different functions. In the present work I have investigated how they were used as methods to 1) manage turn transition of a CB-mediated turn in doing conversation and 2) construct a turn in achieving ‘wants’ and a ‘deictic pointing’. However, the bodily action differed.

4.1.3 General discussion of findings

Recently, in the field of AAC, the view of communication has changed from the static sender-receiver model to seeing communication as a more dynamic process, a joint action between individuals aiming at **collaboratively establishing** meaning (Blackstone et al., 2007; Higginbotham et al., 2007; von Tetzchner & Grove, 2003). This change should influence the research questions and research methodology. Hitherto, this has not been the case. The interactionist perspective has not had a great impact on AAC research on interaction (Wilkins & Higginbotham, 2005), and studies highlighting interaction from this perspective are rare (Clarke, 2005). This thesis is one example in which the dynamic view of communication has been taken.

As discussed above, the CA framework results in the examination of the collaborative process of interaction. Goodwin (2000) argued that in order to

present a theory of joint action it is necessary that all details of language use, of body use, and use of the material world are included (Goodwin, 2000). The present thesis is conducted in line with the analyses of Goodwin (2000). By using the scientific approach of CA, the whole process of interaction has been examined, and relevant resources have been taken into account. These are indications of Bliss symbols, gaze shift, vocalizations, smiles and other bodily action, artifacts, sequential organization, and the participation framework.

The organizational patterns shown in the thesis seem to be social norms that are oriented to and agreed on by the participants in order to facilitate the process of accomplishing mutual understanding. The [symbol pointing + voicing] element and thereby the co-construction of the turn appears to ensure the progressivity of the turn at the same time as there is a possibility to make a repair in the ongoing interaction. The pre-beginnings and post-completions seem central to the turn-taking. They appear to facilitate the initiation of a turn and the completion of a turn. The girl's coordination of gaze direction and arm/hand movement towards an object (paper 3) that is attributed meaning in the local context by the speaking communication partner is an essential method for achieving mutual understanding that the participants seem to have found functional. All these patterns seem to arise in order for the child with SSPI to participate in and control the ongoing interaction and they are oriented to and agreed on, by the participants.

One of the research questions posed in the present work is - In what terms can we describe the interactional processes? The research approach has demonstrated several characteristic features and organizational patterns of the interaction that have emerged. These are not easily observed without the conversation analytic approach and, therefore, they have rarely been highlighted before. They are: **co-construction, ecological balance, and multimodality**. Each characteristic will be specifically discussed below.

One characteristic feature of the interaction is the overt **co-construction**. Both in the interaction with the boy, using a communication board, and in the interaction with the girl, the accomplishment of meaning is co-constructed in a specific manner. Other studies have also shown that interaction to a great extent is characterized by overt co-construction with persons with aphasia and dysarthria (Bloch & Beeke, 2008; Heeschen & Schegloff, 1999). The feature of co-construction is also highlighted by Olsson (2004) in a study of interaction with a child with severe multiple impairments and his caregiver (Olsson, 2004).

Paper (1) showed the co-constructive nature of the turn. Similar findings

have been made by several others, e.g., Collins and Marková (1995), and Higginbotham (1985).

The practice of co-constructing the turn is also found in interaction between persons with amyotrophic lateral sclerosis (ALS) using high technology communication aids and their communication partners (Bloch, 2005), and in interaction between persons with aphasia and their everyday communication partners (Heeschen & Schegloff, 1999; Bloch & Beeke, 2008). Questions have recently been raised whether interaction is built up in similar ways regardless of the diagnosis of aphasia or dysarthria (Beeke & Bloch, 2008). The data at hand indicate that interaction between children with SSPI may be built up in similar ways as interaction with persons with other diagnoses that result in a severe speech impairment. Thus, the analysis in this thesis leads us to conclude that in an interactional perspective the diagnosis may not have a great impact. The fact that the person has a severe speech impairment as such seems to result in a change in the organizational practices of the interaction in similar ways.

In a study of interaction with a person with aphasia and his everyday communication partners, Goodwin (2000) found that the **ecological balance** was altered. The communication partner – the listener – did extensive work and took on some tasks that were normally done by the speaker. According to the data at hand, the participants achieve shared understanding, but the work was also distributed differently from ordinary interaction. The enhanced role of the communication partner was illustrated in all three papers of the present work. Even if, at first glance, the communication partner did a lot of talking, he or she did not always have the conversational floor. He or she was commonly the animator (Goffman, 1979) of the talk while the author, the person that owned the conversational floor, may have been the child with SSPI. In the interaction observed, the speaking communication partner took a larger responsibility than in ordinary interaction. This is also supported by Collins and Marková (1995) in a study of interaction between a woman with severe dysarthria and her speech and language therapist. By organizing interaction in specific ways, the speaking communication partner seems to adapt his/her activity and takes responsibility in different ways depending on the capacities of the child with SSPI. The speaking communication partner thus ‘scaffolds’ the child in various ways depending on the child’s capacities. The behavior of the communication partner is organized differently in paper (1) and (3). A parallel can be drawn to Vygotsky’s (1978) idea about the zone of proximal development, where he suggested that in and through interaction the adult

partner (or more capable peer) scaffolds, that is, helps the individual to develop her competences to a higher level. Here the communication partner scaffolds the interaction at different levels depending on the child's capacities.

The feature of **multimodality** also played a prominent role in the present study. Different resources and methods were used simultaneously to accomplish action. These locally relevant resources that the participants demonstrably orient to, build the so-called contextual configuration (Goodwin, 2000) of each instance in the unfolding interaction. It has been acknowledged for some time in the field of AAC that the interaction is multimodal. However, knowledge is lacking on how the multiple modalities are actually organized in achieving mutual understanding. The present work provides descriptions of how multiple modes are deployed. It has shown that gaze direction, head movement, facial expression (e.g., smiles) and arm/hand movement were bodily action that in combination with vocalizations and indications at Bliss symbols were widely employed.

Another insight from the present work and similar studies (e.g., Clarke, 2005; Higginbotham et al., 1988) is that different bodily actions and vocalizations may be deployed in concert. They are deployed to manage the CB-mediated turn in concert with indications at bliss symbols. They are also employed in combination, when using natural AAC modes, as in the turns by the girl in paper (3). Thus, as well as functioning as the turn and hence action of interaction itself, as in paper (3), bodily action and vocalizations may be employed to make the turn-taking work (paper 2). Thus, this study demonstrated that the human body is the site for different functions that are employed in concert with other resources in the unfolding interaction. This is systematically employed and thus recognizable by the participants. This finding is supported by Goodwin (2000) who investigated girls playing hopscotch and archaeologists coding colors with a color chart. He concluded that human action is built through the simultaneous deployment of a range of quite different semiotic resources.

One of the resources, the sequential organization, was employed as a resource in the locally accomplished shared understanding. The child's action is constantly conducted in a sequence, as a response to a prior turn. The sequential location supports the understanding of the child's action. This is supported by other studies (e.g., Clarke & Wilkinson, 2008). The sequential organization may also hinder the accomplishment of mutual understanding in AAC (Clarke & Wilkinson, 2008; Bloch & Wilkinson, 2004). For example, the speaking partner may have difficulties understanding a VOCA-mediated

turn initiation due to the fact that he or she relates it to the previous turn when, in fact, it is not related to the speaking communication partner's prior turn. However, this is not further examined in the present work.

Another resource that is used in the data is the participation framework (Goodwin, 2000). The on-going activity in which the interactants participate is used as an essential resource in constructing shared understanding. The data have demonstrated several examples of this, for instance, questioning each other about favorite food (paper 2). When the boy indicated the Bliss symbol 'candy' in the participation framework of questioning each other about food, it was understood by the speaking communication partner as a request for information about favorite candy. In paper (3) the special education teacher and Maria were playing a game with a boat. When Maria coordinated gaze and arm/hand movement towards the boat, it was understood by the special education teacher as if Maria wanted to move the boat.

Additionally, in accomplishing shared understanding, artifacts are applied as another important resource. In the data they form a constitutive feature for achieving understanding. One apparent artifact is the Blissymbolics communication board which both participants orient to in turn initiation and building up a turn in paper (1) and (2). In paper (3) there are several resources in use of which the artifacts are of importance. These are the objects that the girl and her co-participants orient to. They are crucial to the achievement of shared meaning in that they give a clue to what the content in the turn is about, to what the girl wants and points at. These are, for instance, a package of drinks, a toy boat, a photo album, a small communication board, and a bun. Artifacts are also observed as important features in studies of ordinary interaction where they may have different functions (Goodwin, 2000; Mondada, 2006). In the field of AAC they are rarely highlighted and in-depth descriptions are lacking (for examples of studies that do highlight them, see, e.g., Clarke, 2005; Rae Fulcher & Higginbotham, 2010). In the clinical field of AAC, objects are considered as an AAC mode (Blackstone, 1993). Paper (3) is a description when objects in the surrounding are employed in combination with other resources to achieve understanding in everyday interaction. Hence, by examining the entire AAC process, several characteristic features in the interaction, mentioned above, stood out.

Apart from these above discussed features, there has been previous discussion in the field of AAC, as noted above, that the participant with severe speech impairment typically plays a 'passive' role in interaction (see section 2.2.6). This has recently been questioned by several researchers (Clarke, 2005;

Ferm 2006). Based on the analyses of the present thesis, one may also draw the conclusion that this statement might be nuanced. The non-speaking participants in the present data are creative and active in their use of the different resources that are available for them to create meaning. The boy has resources and methods to accomplish different actions and control the turn-taking, claim a turn, build up a turn, and complete a turn (paper 1 and 2). The girl, in paper (3) employs different resources and methods to create meaning to accomplish wants and a deictic pointing. Moreover, the methods are pursued if not oriented to as expected by the participants. Thus, by looking at all resources employed and not focusing on linguistic expression, the analyses suggest that the notion 'passive' should be nuanced.

Another widely explored phenomenon in the research field of AAC, also discussed above, (see section 2.3.2) is the concept of intention. Paper (3) demonstrated what it can look like when intention is achieved. The co-participants collaboratively and locally achieve intention through the coordination of gaze direction and arm/hand movement. As mentioned above, we can never be certain of the intentional status in any interaction, including the interaction in paper (3). However, in the materials at hand it has been observed that some of the conduct of the child in paper (3) follows a prior question, as a second pair part. The fact that it follows a question and is treated by the communication partner as a response, indicates that it may be understood as a response to an action (spoken and embodied) by the co-participant. As such, the child's act can be considered as social and having a communicative intent. Olsson (2004) argued that intention is a co-created outcome of interpersonal interaction. This is supported by the findings in paper (3). By conducting sequential analyses as in paper (3) there is a possibility to describe how intention is achieved. Similar descriptions may be useful for assessment and intervention. In some instances the conduct in paper (3) occurs as a first pair part and then it is not certain whether it had a communicative intent or solely was intentional behaviour. However, it made a contribution to the ongoing interaction in that it was treated as a contribution to it. Thus, the findings lead to a nuanced description of the complex and subtle process of AAC.

Additionally, a phenomenon that also has been noted in previous studies is that the speaking interactant organizes the use of the communication aid. When studying children using VOCAs in interaction with their peers, Clarke (2005), found that the interaction framework was often organized by the speaking co-participant, typically as questions that require the use of the VOCA or after a meta-interactional turn. The speaking communication

partner allocated a structural location for VOCA use. Clarke (2005) suggested that the speaking partner prompted the use of the VOCA, and that the VOCA wouldn't have been used if it had not been for the speaking partner's organization of the interaction. This was not supported in the analyses in paper (1) and (2). In these data the boy with SSPI who uses his low technology communication aid, a bliss communication board, takes a first pair part in a question-answer sequence. Communication board use is initiated by both the non-speaking co-participant and the speaking co-participant. Questions where the answer is known before-hand (Clarke, 2005; von Tetzchner & Martinsen, 1996) were not found in the data in which the boy uses a communication board. Hence the interaction appears to be less predictable in these data. If there is an interactional difference depending on the communication aid, the reasons for this difference needs future investigation. It is notable, however, that the boy in paper (1) and (2) has both a low technology communication board and a high technology communication aid and when he was going to be video recorded he chose the low technology Blissymbolics communication board. Questions may be raised whether the low technology communication aid has interactional advantages to the high technology communication aid in terms of increased co-construction and less time consumption. This has not been the focus of the present study but has been, as mentioned above, observed in other studies (Higginbotham, 1989; Wilkins & Higginbotham, 2005).

4.1.4 Generalizability of findings

As the present work has been done within the CA approach, a qualitative research method, the focus is on identifying phenomena and giving a thorough description of these. The findings in CA lead to descriptions of organizational patterns of interaction. These are organizational patterns that the participants may employ. The frequency of occurrence has not been investigated. By investigating single occurrences, and recognizing the responsive nature of interaction, CA has contributed to identifying many basic social norms and regularities in ordinary interaction that participants orient to (Schegloff, 1993). These findings are drawn from investigations of ordinary interaction. Considering interaction with people with impairment, as is the case in the interaction that is studied in the present thesis, the case may be different since the persons with impairment may not have the same capacities as the co-participants or may not have the same capacities as other persons with impairment in other interaction. The population of persons who use AAC modes is heterogenous

(Pennington et al, 2007). The children with SSPI in the present study have different capacities and resources available for interaction. Additionally, only a small amount of data has been analyzed. Two children have been reported, although each child in interaction with several communication partners. It is possible that this is a limitation to the study. The findings in the thesis may be considered difficult to generalize to other interaction including other individuals. Still, as already indicated in the discussion above, some of the findings, using CA as an approach that describes interactional patterns as they emerge in the here-and-now, seem generalizable:

PAPER 1 – There are several studies of turns/contributions of people with severe communication impairments. Findings from studies with persons with MND - dysarthria, aphasia (Bloch & Beeke, 2008), and children using VOCA:s (Clarke, 2005) seem to support the findings of paper (1), namely that the turn is co-constructed, consisting of at first one element, in this case a symbol pointing. The first element is commonly followed by a second element, a voicing element (other terms are used in other studies) thereby constructing a TCU-based turn. The turns consist of one or several [symbol pointing+ voicing] elements. In other studies involving persons with dysarthria, a spoken word or letters in spelling sequences (that are difficult to understand due to dysarthria or aphasia) may be repeated (by ‘re-doing’ it) in the same manner as in paper (1) (Bloch, 2005; Bloch & Beeke, 2008). Hence, it seems that this feature of voicing occurs in interaction with persons with other diagnoses but with the common characteristic that the impairment results in a severe speech impairment.

PAPER 2 – The findings in paper (2) showed that the co-participants employed different methods and resources to facilitate turn-taking. The participants used methods to initiate a turn (pre-beginnings) and to complete a turn (post-completions). Pre-beginnings were used before the CB-mediated turn. Post-completions were employed at the end of the CB-mediated turn. It is argued that pre-beginnings are crucial to get the right to a turn and post-completions are crucial to complete a turn in the lack of other turn completion cues. The common orientation to the communication board is a prerequisite in the beginning of a CB-mediated turn. Since the feature of prosody lacks in this kind of interaction other ways may be needed to complete a turn. Thus, methods for initiating and completing a turn are likely to be relevant for many individuals in the population of persons who use communication aids (Higginbotham et al., 1988). Consequently, it is plausible that pre-beginnings and post-completions are used by other children *and* adults who augment

their communication with blissymbolics. It could also be that other individuals using other graphic modes as for example Picture Communication Symbols (PCS) (Mayer-Johnson, 1995) employ such methods and resources. Moreover, it is possible that pre-beginning and post-completion methods are employed but with other resources than the ones applied in the data at hand, depending on the resources that are available to the specific individual in the interaction. Hence, it is likely that methods for pre-beginning and post-completions of turns will be found since these communication systems can also store the words/concepts on a communication board which requires the mutual orientation of the participants to the communication board. However, the method may be organized with other resources. Manual signing also requires a visual orientation to the co-participant's hands and signs. This fact makes it likely that the finding, that pre-beginning and post-completion methods may be employed, could also be valid for interaction with manual signs as an AAC mode. Thus, the finding that a specific interactional pattern occurs may be generalizable to other challenged interaction although the resources and methods may vary. Future research can shed more light on this matter.

PAPER 3 - By doing a thorough sequential analysis on data from interactions between a girl with SSPI and moderate intellectual disability, a method was found which three different participants deployed together with the girl to create meaning. The method comprised the gaze at an object in coordination with arm/hand movement by the girl at an object. The combination of these resources is treated by the speaking communication partner as a 'want' or a deictic pointing action. Since this method was treated as such by three different communication partners, it is likely that it may also be employed in interaction between other communication partners and the girl. There is a need for future studies to increase the knowledge about these methods.

4.2 Findings and future research

By using CA as a research method the whole communicative process of AAC has been possible to explore.

The study suggests that in order to accomplish turns, turn-taking and achieve shared understanding, the participants in these interactions organize their interaction in specific, systematic and thus recognizable ways. It is suggested that some of these patterns may be generalizable to other challenged interaction. It seems that the participants in the data at hand have found that these organizational patterns work smoothly when they accomplish shared understanding.

Several organizational patterns have been identified. The findings show different methods deployed by the participants to accomplish 'doing conversation' and methods to achieve 'a want' and a deictic pointing function.

The interaction was found to be multimodal and the different resources and methods were deployed in concert with each other to a high degree. This was accomplished by the use of several resources apart from the formal Blissymbolics communication board. These resources and methods were co-construction, the sequential organization, the participation framework, bodily action and vocalizations, and artifacts in the surroundings.

As mentioned, an essential feature of the interaction was the wide use of co-construction that occurred in the interaction of all the participants. More specifically, when using a communication board, the turns were constructed in a specific pattern of [symbol pointing + voicing] elements that built up the turn, step-by-step, to a so-called TCU-based turn.

Bodily action and vocalizations were used in several creative ways. To claim the turn and to complete the turn, and thus achieve a transfer of turns, the turns using the communication board of the boy with SSPI in paper (1) and (2) were organized in pre-beginning and post-completion methods. In the pre-beginnings gaze direction, smiles, tongue movements, vocalizations and arm movements were employed, and in the post-completions, gaze direction and smiles were used.

The patterns of collaboratively accomplished 'intention' using natural AAC modes achieved by a girl with SSPI and moderate intellectual disability and her everyday communication partners were described. Crucial resources were gaze in coordination with arm/hand movement, vocalizations and objects in the material surrounding.

The present work is a contribution to the body of qualitative research studies in AAC interaction and provides an in-depth description of how AAC interaction may be organized. The thesis attempts to partly fill the gap in the studies on interaction with children with SSPI, using the conversation analytic approach. Thus, it focuses on the interactional process which is rare in the field of AAC. The interaction using a formal Blissymbolics communication on a low technology communication aid was explored. In addition, interaction using natural resources was studied. Studies of naturally produced resources and AAC turns, turn-taking and initiation and completion of a turn are rare.

The findings strongly suggest the importance of taking into account multiple interactionally relevant modalities when exploring interaction of this kind. A micro-analytic approach results in insights into the manners in which

bodily action and vocalizations are jointly deployed with the use of the communication aid. These methods seem just as important as the use of the communication board.

In addition, the present work contributes to conversation analytic findings in multimodality. It shows how multimodal resources may be organized in systematic but wider ways when talk is not an available resource for one of the participants. Different organizational patterns were found that accomplished turns and turn-taking. Based on the findings we will be able to better describe spontaneous everyday interaction where at least one partner uses AAC modes. The thesis has led to a better understanding of the nature of interaction under different circumstances. The findings add another piece to the big puzzle of AAC. Enhanced knowledge of the nature of the AAC process may lead to better assessment and intervention. Understanding how the participants actually accomplish interaction and conversation can have important implications for research as well as clinical service, and technology design (Higginbotham, 2009).

Regarding future studies, there are several lines to follow and some have been mentioned above. The data collected for the project are far from exhausted. Several other features may be explored:

In paper (1) a non TCU-based turn was analyzed. To study more occurrences of non TCU-based turns would add to our knowledge of the characteristics of these turns. This would lead to an ameliorated description of how participants accomplish turns and turn-taking with communication aids.

An observation that has been made in previous studies and also in clinical work is that the participants commonly have trouble finding the referent of the utterance (Collins, 1996). In the data at hand several instances were also observed in which the intersubjectivity was hindered and a long repair sequence of the trouble was organized. It would be highly motivated to examine the methods that are employed when repair is done. This could entail in increased use of these methods, resulting in increased mutual understanding.

Apart from the social actions explored here, other actions and methods deployed to achieve them should also be explored. It would also add to the knowledge in the field of AAC to investigate how interaction with other formal AAC modes as, for example, manual signs is carried out. Moreover, to explore the turns of other children with SSPI's and the use of pre-beginnings and post-completions would further deepen the knowledge of the techniques used. In addition, more thorough examination of the use of artifacts as a resource in the interaction and the use of other graphic pictures and symbols

would contribute significantly to the area. These insights could result in a better description of this kind of interaction, to better intervention, and eventually, to increased mutual understanding.

4.3 Clinical implications

AAC is characterized by a great deal of overt co-construction. A change of perspective towards focusing the 'dyad' instead of the person with impairment should ameliorate assessment and intervention, in order to support both participants in the interaction and increase mutual understanding. Turns and turn-taking are fundamental features in interaction and assessment may focus on the process of accomplishing turns, turn pre-beginnings and post-completions.

The present study also gives support to conducting assessment in natural everyday settings, for instance, video recordings of the child with SSPI interacting with a parent at home. This is the place where interaction is mainly done and therefore it seems to be of vital importance to assess interaction in that particular place.

Assessment of interaction could be conducted also using naturally occurring data analyzed in a sequential manner. In that way, the resources and methods that the participants employ systematically and recurrently will be shown. These methods can be taught to new communication partners so that they can better adapt to this kind of interaction and achieve shared understanding.

Considering clinicians' description of the interaction, the present study may lead to better characterization and knowledge of the process of AAC. It may entail an awareness how the turn-taking can be organized. It can also result in a focus on the use of multiple resources instead of an over-reliance on one AAC mode, which is commonly the case (Wilkins & Higginbotham, 2005). The knowledge of the organizational patterns having been found in the two cases, may result in an awareness of the true nature of the process of AAC, how the communication aid influences interaction, and how turns may be organized in a different manner than in ordinary interaction. An awareness of the co-constructive nature of interaction with persons with SSPI is also essential for the communication partners. New communication partners can be taught the pattern of symbol pointing and voicing and what its advantages may be.

Moreover, interaction between the co-participants may be improved by teaching communication partners to be focused on bodily action and vocali-

zations and that the turns are jointly employed with Blissymbolics on a communication board. Furthermore, speech and language therapists can teach communication partners to be aware of pre-beginnings to facilitate the possibility to claim a turn for the person with SSPI. Intervention can also focus on teaching the communication partner to be aware of post-completions, possible resources and methods, and how they can function.

Considering goals and outcomes, the traditional intervention goals in AAC commonly focus on the individual's actions in isolation. Sentence construction is an example of what is focused on (Wilkins & Higginbotham, 2005). As mentioned, drawing on the findings in the present study, questions may be raised about this focus. The findings of the thesis suggest that intervention should shift focus to the operation of jointly accomplishing interaction. It is argued that it would be fruitful to change perspective from the individual monologic perspective to the multimodal use of different resources in joint collaboration by the interactants.

In addition, achieving a better understanding of situated interaction and taking an interactionist approach may prove to be fruitful for designing AAC technologies (Higginbotham et al., 2007). It has recently been argued that high technology communication aids focus on language structure i.e., sentence construction instead of language use (Wilkins & Higginbotham, 2005). Since it has been shown that both interactants mutually orient to the communication aid, this indicates that the communication aid should be constructed in a manner that takes into account both communication partners' needs. Additionally, high technology communication aids may turn out to be more useful if the construction of a high technology communication aid was based on interactional findings and organized in a more sequential manner. For example, it might result in an increased mutual understanding if the speaking communication partner's turn was recorded and displayed as a point of departure when the next turn of the person with severe speech impairment was constructed.

Finally, the manner in which any communication aid, high or low technology, is talked about may also influence the use of it. If it is referred to as the communication aid of the interaction instead of belonging to one person, it would probably enhance the possibilities for it to facilitate interaction.

5 Summaries of papers

5.1 Summary of paper 1

In paper (1), interaction between a boy with SSPI and his everyday communication partners is explored using CA as a method. The boy augments his communication with Blissymbolics on a communication board. The findings show that the participants organize their interaction in turns although they differ from ordinary turns-at-talk. The CB-mediated turns orient to ongoing activities in the interaction and are thus context-shaped. The CB-mediated turns are regarded as recognizable actions by the participants and are responded to in the next turn, thus being context-renewing. Projectable transition relevance places (TRPs) may occur and there is a shift in primary speakership, thus turn-taking occurs. The turns are co-constructed in a way that the boy points at a bliss symbol and the co-participant voices and thereby constructs a TCU, the turn is a TCU-based turn. The turns consist of one or several [symbol pointing+ voicing] elements. Non TCU-based turns also occur in the data. The non TCU-based turn consists of a ‘symbol pointing’ that is not followed by a ‘voicing element’ (by the speaking co-participant), thus it was not TCU-based. However, the ‘symbol pointing’ in the data was still treated as a turn by the participants. In contrast to the non TCU-based turn, the TCU-based turn makes the action hearable through the ‘voicing act’. In that sense, the voicing contributes to constructing projectability of a possible completion of the turn.

Different design of the TCU-based turns are demonstrated. The data show that apart from being an ordinary communication partner, the speaking participant as a listener has extended his work. Among other things, he or she commonly voices and articulates what the non-speaking participant is ‘saying’.

5.2 Summary of paper 2

Paper (2) is an investigation of interaction between the same boy as in paper (1), a boy with SSPI and his everyday communication partners. The same communication board with Blissymbolics is used. The principles and practices of CA are employed in the data collection, the transcription and the analysis. The findings indicate that the participants orient to specific methods using bodily action and vocalizations (exclusive of Blissymbolics) to initiate and complete a turn. The boy initiated a CB-mediated turn by gazing first at the speaking communication partner and then at the communication board,

thereby 'catching' the speaking communication partner's gaze before pointing at the communication board. Sometimes he initiated a CB-mediated turn by redirecting his attention directly to the communication board without having to look at the communication partner first, thus demonstrating a kind of assumed robustness in the use of this method of redirecting the orientation. Apart from gaze direction, other resources that may be employed in pre-beginnings are smiles, tongue movements, vocalizations and arm movements. As well as having resources to initiate a turn, the participants also have resources and methods to complete a CB-mediated turn. As a post-completion, the boy may employ gaze direction at the co-participant and smiles. The post-completion functions in similar ways as completion methods. The boy's use of these resources is recognizable to the participant as methods, moreover, as specific methods accomplishing specific actions. The practices of pre-beginnings and post-completions seem to be crucial in order to make turn-taking work in the materials at hand.

5.3 Summary of paper 3

The practices of accomplishing shared understanding using natural resources such as gaze in coordination with arm/hand movement and other bodily actions are scrutinized in paper (3). Interaction between a girl with SSPI and a moderate intellectual disability and her everyday communication partners is explored. Conversation analysis was applied as the method of analysis. The paper shows that a specific method is used and oriented to by the participants. The method was organized in and through the girl's coordination of gaze direction and arm/hand movement towards an object in the material surroundings. It is shown that the participants collaboratively create local meaning and intention by deploying these resources and methods. The actions that were accomplished were 'wants' and a deictic function. Other resources may also be employed. The speaking participant attributed meaning to the girl's actions. The attributed meaning is shown to be context-specific.

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Appendices

APPENDIX A:

BACKGROUND INFORMATION

Background information on the children with SSPI. The information comes from the SLT (who looked in the journal) and the mother/father. The mother and the speech and language therapist answered questions orally from Social networks (Blackstone & Hunt Berg, 2008). The interviews were done by the researcher.

MAGNUS

Informant	Med. diagnosis	Log diagnosis	Language comprehension	Cognitive assessment
Magnus, 8;6 år 001122	CP -dyskinetic syndrome G803 Gastrostomi Z931	Anarthria, Receptive language disorder F80.2B	SIT 200609: 6 errors/ 46 items age of 5;10 years. Normal for age level	060605WPPSI-III Found to be on an average level.

Vision: ok Hearing: ok

Language spoken at home: Persian

Training in communication and AAC of parents: 2-day course in Blissymbolics

Formal AAC mode: Blissymbolics communication board.

Bliss symbols: 584 (2x2cm). All letters and numbers 0-10. Has been exposed to Blissymbolics for more than 5 years.

Selection technique: direct selection with light pointer attached on glasses

Magnus has had an electronic communication aid for a couple of years. He directs it with a head mouse.

MARIA

Informant	Med. diagnosis	Log diagnosis	Language comprehension	Cognitive assessment
Maria, 10;4 years 990203	Cerebral palsy - dyskinetic syndrome G803, G409	Anarthria, Receptive language disorder F80.2B	Difficult to assess. Done by speech and language therapist, in Play situation and informal assessment with objects, April-2010 No proven word comprehension.	Assessed by psychologist in habilitation team Dec-2009: with WISC-IV, Leiter-R VL, Merillpalmer, questionnaire and discussion with mother and staff at school: Moderate intellectual disability

Vision: ok Hearing: ok, hearing difficulties when fluid behind the ear drum

Language spoken at home: Swedish

Training in communication and AAC of parents: Mother has a 2-day course in Blissymbolics

AAC modes reported by mother and SLT: natural AAC modes (body communication, vocalizations). Maria has a Blissymbolics communication board with 209 symbols (3 x 3cm), no letters or numbers. Maria has been exposed to Blissymbolics for 4 years. Maria indicates the bliss symbols with direct selection, pointing with her fist/hand.

Maria has no electronic communication aid.

BERT

Informant	Med. diagnosis	Log diagnosis	Language comprehension	Cognitive assessment
Bert 11;10 years	CP - dyskinetic syndrome G803, G409	Anarthria	TROG-II feb-2010 13/20 blocks 8th percentile on age adequate SIT nov-2009 at age 11;10 years 1-3 errors, 6-7 years level	No diagnosed intellectual disability

Vision: ok Hearing: ok

Language spoken at home: Swedish

Training in communication or AAC of parents: none.

Formal AAC mode: Blissymbolics on a communication board. 523 (1,5 x 1,5cm)

Bliss symbols and all letters and numbers (0-10) on the communication board. Bert has been exposed to Blissymbolics for 4 years. Bert indicates the symbols by direct selection with finger. Bert has no electronic communication aid.

The everyday communication partners

Magnus's mother and father have attended a 2-day course in Blissymbolics. Their mother tongue is Persian.

Magnus's friend is a girl in his ordinary class. She had no history of communication difficulties and had never had any contact with speech and language therapist or health care for language difficulties. She has no training in communication or AAC. Her mother tongue is Swedish.

Magnus's assistant has at the time of the recording worked with Magnus for 1,5 years. He has received no training in communication or AAC. His mother tongue is Swedish.

Maria's mother has attended a 2-day course in Blissymbolics. Her mother tongue is Swedish.

Maria's grandmother and grandfather have received no formal training and their mother tongue is Swedish.

Maria's special education teacher has, apart from her special education teacher's certificate, long experience in working with AAC and an AAC course at the University. Her mother tongue is Icelandic but she speaks Swedish fluently.

Bert's father and mother have no formal training in AAC. Their mother tongue is Swedish.

In the data there is one instance of interaction between Bert and Magnus (not analyzed in the presented articles). The interaction is interpreted/supported by an assistant at school. She had a long experience of working with AAC and had attended numerous courses in AAC and Blissymbolics. Her mother tongue is Swedish.

Förfrågan om deltagande i ett forskningsprojekt kring samtal med alternativ kommunikation

1. Bakgrund och syfte

I höst har ett forskningsprojekt startats och det beräknas pågå i 3 år. Projektet handlar om samtal med alternativ kommunikation (bl a bliss, tecken, kroppsspråk mm.) – hur samtal egentligen går till. Vi vill studera hur samtal/samspel fungerar i vardagen. Den kunskap som kommer fram i projektet kan ge bättre möjligheter för föräldrar, lärare, assistenter och andra, att ge stöd till barn och ungdomar som kommunicerar med alternativ kommunikation.

2. Förfrågan om deltagande

Ni som tillfrågas om deltagande är elever som kommunicerar med alternativ kommunikation som går på Munkhätteskolan/andra skolor i Malmö kommun och era familjer. Tillsammans med personal och rektor har ni blivit utvalda att tillfrågas.

Nu undrar vi om och Ni skulle kunna tänka er att delta i projektet?

3. Hur går studien till?

I projektet ingår filmning av vardagliga situationer i skolan och på hemvisten. Filmningen kommer att ske när ditt barn/ungdom kommunicerar med en talande kamrat och/eller en blissande kamrat, syskon eller en vuxen i skolan och/eller på hemvisten.

Det hade också varit av stort värde för projektet att filma ert barn/ungdom i hemmiljö i ett vardagligt samtal/samspel tillsammans med ett syskon och/eller förälder.

Filmning kommer att ske vid ett flertal tillfällen under våren 2009 och hösten 2009 i skolan samt, om ni medger, även i hemmet. Varje filmtillfälle beräknas ta ca 20 minuter till en timme. Filmningen kommer att ske i vard-

agssituationer med vardagliga samtalspartners som t ex syskon, förälder, skolkamrat, lärare och assistent. Om filmning av skolkamrat blir aktuell kommer filmtillstånd att inhämtas av kamraten och dennes vårdnadshavare. Om filmning i hemmet blir aktuell kommer vi överens om en tid och aktivitet som passar er.

För att få en fullödig bild av ditt barns/ungdoms kommunikation vill vi också intervjua er utifrån ett formulär som bl a kallas ”Sociala Nätverk” samt ett formulär som kallas ”Bedömning av spontan kommunikation”. Intervjun beräknas ta 1,5 tim.

I samma syfte skulle vi också behöva göra samma intervju med ditt barns logoped/lärare.

Vi skulle också behöva få tillgång till ert barns journal för att få uppgift om medicinsk diagnos och eventuell bedömning av kognitiv utvecklingsnivå samt uppgift från logopedjournalen kring logopedisk diagnos och bedömning av ert barns språkförståelse samt andra delar som kan vara aktuella för projektets syften.

Intervjuer och filmning kommer göras av leg logoped Maja Sigurd Pilesjö.

4. Vilka är riskerna?

En eventuell medverkan är helt ofarlig för er som deltar. Deltagare i projektet kommer att vara anonyma.

5. Hantering av data

Data i form av film och intervjuer kommer att behandlas så att inte obehöriga kan ta del av dem. Deltagarna kommer ges ett kodnamn så att det inte går att identifiera er. Det kodnamnet kommer att användas genomgående i olika forskningsrapporter. Filmerna och intervjuformulär kommer förvaras i ett låst skåp på Institutionen för Språk och Kommunikation på Syddansk Universitet i Odense. Filmerna kommer att analyseras av andra forskare i den forskargrupp där projektet äger rum samt av opponent och betygsnämnd vid framtida disputation.

6. Hur får jag information om studiens resultat?

Projektets resultat kommer presenteras i en avhandling och i artiklar i vetenskapliga tidskrifter.

Deltagare får kopia av intervju och film om så önskas. Ni får också resultat av studien skickade till er om ni så önskar. Vi vill också ge ert barn/ungdom en symbolisk ersättning som tack för hjälpen.

7. Frivillighet

Deltagare kan dra sig ur när som helst utan att det får några konsekvenser för framtida behandlingsinsatser. Deltagare, både barn/ungdom och andra inblandade kan när som helst avbryta filmning om så önskas.

8. Projektansvariga

Huvudman för projektet är Institutionen för Språk och Kommunikation, Syddansk Universitet, Odense. Handledare är lektor Gitte Rasmussen Hougaard vid samma institution.

Har du några frågor och funderingar kring projektet är du mer än välkommen att höra av dig till:

Maja Sigurd Pilesjö, telnr: 040-346650 el mobilnr: 0703-946744 eller på e-postadress: maja.sigurd-pilesjo@malmo.se

Med vänlig hälsning,

Maja Sigurd Pilesjö
Leg logoped, Doktorand
Institutionen för Språk
och Kommunikation
Syddansk Universitet, Odense

Gitte Rasmussen Hougaard
Lektor, ph.d

PAPER I

Exploring interaction between a non-speaking boy using aided Augmentative and Alternative Communication and his everyday communication partners: Features of turn organization and turn design

Maja Sigurd Pilesjö and Gitte Rasmussen*

University of Southern Denmark, Odense, Denmark

Abstract

This study investigates the practice of achieving common understanding in aided Augmentative and Alternative Communication (AAC). The aims are to explore whether communicative contributions can be described as turns, as defined in conversation analytic terms, and how then the contributions to the interaction can be designed. The principles and practices of Conversation Analysis (CA) were used to record, transcribe and analyse conversations between a non-speaking boy with cerebral palsy with, on different occasions, his mother, his assistant and his friend. The boy augments his communication with aided AAC, bliss symbolics on a communication board. The analysis indicates that the participants can collaboratively create and orient to units in interaction equivalent to turns in interaction although they differ dramatically from ordinary turns-at-talk. The analyses demonstrate that the boy's turn is oriented to as a co-constructed and thus interactionally achieved unit: the boy points at a bliss symbol which is given voice by the speaking co-participant. In and through the relevant made voicing of the turn, a turn constructional unit (TCU) emerges, and the turn is designed and oriented to as a TCU-based turn. The analysis will also show that turns can be designed as

* Corresponding author. E-mail: msp@language.sdu.dk



non-TCU-based turns. These findings may have implications for CA theory as well as for clinical intervention.

KEYWORDS: AIDED AUGMENTATIVE AND ALTERNATIVE COMMUNICATION; CONVERSATION ANALYSIS; TURN ORGANIZATION; (NON) TCU-BASED TURNS; TURNTAKING; DISABILITY

1 Introduction

Some individuals have such severe communication impairments that they need other means than speech for communication. The term Augmentative and Alternative Communication (AAC) refers to communication where one individual with a communicative disability communicates by means other than, or in addition to, speech (Heister Trygg *et al.* 1998). Some of the individuals, communicating with AAC, keep their words/symbols/pictures in communication aids (e.g. boards, charts and computers). This interaction is referred to as aided AAC. Interaction under these different circumstances remains little explored for various reasons (Kraat 1985; Light 1988; Müller and Soto 2000; von Tetzchner and Hygum Jensen 1996). It is known that aided AAC is highly multimodal and co-constructed (Buzolich and Wieman 1988; Harris 1982; Kraat 1985; von Tetzchner and Hygum Jensen 1996). There is, however, not much in-depth knowledge about how the interaction is built up, organized and managed by the participants. Furthermore, the emphasis in previous research has mainly been on the person with the communicative disability and the use of AAC as a means for that person to transfer information. Only recently has research begun to focus on the ways these aids are used by all participants to organize their mutual social interactions in order to achieve an intersubjective understanding. This recent research is based on recordings of naturally occurring social interaction and employs qualitative research methods.

This study will focus on interaction between a non-speaking boy and his everyday communication partners. The principles and practices of Conversation Analysis (CA) will be used as the method of research (Heritage 1984; Hutchby and Wooffitt 2008). CA analyses how participants in interaction manage and organize interaction as a collaborative and dynamic process. CA regards talk as action and seeks to understand what the participants achieve in and through their actions. CA aims at getting insight into how participants' actions are organized, arranged and systematized in interaction. The main issue concerns identifying which aspects of the action the participants themselves treat as interactionally relevant, that is what they orient to as being relevant for the ongoing process of sense-making. By a detailed sequential



analysis, CA describes the ways interaction is organized by the participants. The analysis is made from a detailed transcription from recordings of naturally occurring interaction and leads to a description of practices, showing the organizational recurrent, systematic and thus sense-making patterns in the interaction (Hutchby and Wooffitt 2008).

Although the study of interaction with AAC, from a Conversation Analysis perspective, is fairly new, the last decade has shown an increase in disability research using ethnomethodology (EM) and Conversation Analysis (Goode 1994; Rapley 2004; Rasmussen 2010; Robillard 1999) and CA has recently been applied to communication disorders to an increasing degree (Clarke 2005; Perkins 2007). We are going to explore the interaction of a boy who has cerebral palsy and therefore such severe difficulties with his speech/language and motor ability that he is unable to speak in the ordinary manner. He augments his interaction with graphic symbols called *bliss symbolics* (McNaughton 1985). The graphic symbols are kept on a communication board.

The focus will be on the basic aspects of interaction: are the participants able to organize their interactions in turns or turn-like units as they are defined in CA? Are there different practices for designing contributions to an ongoing interaction? What are the features of participants' contributions?

2 The 'turn' unit in CA

As already mentioned, the present study concerns a boy who is unable to speak. As also mentioned, it applies CA as a method. This can be seen as a paradox because CA has mainly studied *talk-in-interaction*, which means that categories and concepts are based on talk. One of the concepts that is central to this study is 'turns'. The question then arises if and how the organization of interaction with a non-speaking boy is organized in and through 'turns'. Before entering the analysis, let us sketch out shortly the concept as it has been described within CA.

2.1 Defining turns (-at-talk)

CA has described how participants in interaction organize activities as for example having a meeting, playing a game, having a conversation, or visiting the doctor, through taking turns in systematic ways (Sacks *et al.* 1974). A turn can be defined as follows:

the talk of one party bounded by the talk of others constitutes a turn, with turn-taking being the process through which the party doing the talk of the moment is changed. (Goodwin 1981: 2)



According to Sacks *et al.* (1974) turns display gross organizational features that reflect their occurrence in series. They regularly have a three-part structure:

one which addresses the relation of a turn to a prior, one involved with what is occupying the turn, and one which addresses the relation of the turn to a succeeding one. (Sacks *et al.* 1974: 722)

In other words a turn relates to the previous turn, it contributes something new to the interaction and it lays out a trajectory which the turn that is to come will possibly relate to.

Another feature of a turn is that it constitutes 'a recognizable action' (Schegloff, 2007: 4). As already mentioned above 'action' includes talk as a main feature. However, CA work has been carried out which includes non-spoken turns, in which participants employ other resources (Schegloff 1998; Goodwin 2003; Rasmussen 2010).

2.2 The turn constructional unit

In CA, the minimal analysable unit is the turn constructional unit, a TCU. TCUs correspond broadly to the following linguistic categories; sentences, clauses, single words or phrases (Sacks *et al.* 1974). Grammar, prosody and sequential position are the three organizational resources in constructing TCUs which are in themselves the blocks that turns-at-talk are built of.

There are two main features of TCUs. The first one is projectability. This concept captures the possibility for the participants to project what type of unit in progress it is, and at what point it is likely to end. Units lacking this feature may, according to Sacks *et al.* (1974), not be usable in the same way. The second key feature is that the TCUs bring into play the so-called 'transition-relevance places' (TRPs) (Sacks *et al.*, 1974) at their boundaries. A TRP emerges when the speaker approaches the possible completion of a TCU in a turn and a transition to a next speaker can become relevant.

For current research in interactions in which action is organized around non-spoken activities and resources, such as aided AAC, it is a challenge to adapt these basic categories, if possible at all. As for any CA study, the question of whether such actions are TCUs or not, has to be answered by participants in interaction themselves. The question is thus whether the *participants* treat them as TCUs. As will be shown in the sections below, the co-participants in the data used for the study at hand, treat pointing at symbols and other non-spoken actions as possible resources for TCU building.



2.3 Primary speakership

Another central aspect of defining ‘turns’ as units in interaction is the notion of ‘primary speakership’. When you are in control of the conversational floor you also have the primary speakership. The listener, however, is not passive and can utter things like for example ‘uh huh’ or ‘right’ (Schegloff 1982). These contributions can for example have the function of a claim of understanding, a display of interest, displaying the listener’s passing of a possibility to produce a turn, thus indicating that the speaker should continue the talk. Even though the listener does produce talk such as backchannels or continuers (Ford and Thompson 1996; Schegloff 1982), the participants orient to the talk as not claiming the primary speakership.

2.4 Turntaking

The turn unit and the process of turntaking are two inseparable aspects of the same phenomenon. As indicated above, Sacks *et al.* (1974) describe the systematics of turntaking in its simplest form. They found, among other things, that participants orient to the social norm ‘one speaker at a time’ by applying specific rules of a turntaking system. For achieving that, the participants in interaction employ a variety of techniques for taking and allocating turns-at-talk so that overlaps are brief and gaps at TRPs are short. As the turn, so is the turntaking-system ‘locally managed, party-administered and interactionally controlled’ (Goodwin 1981; Sacks *et al.* 1974).

3 Interactional studies of severe communication disorders

According to studies of severe communication disorders, interactions using aided AAC are characterized as multi-modal and co-constructed (Collins 1996; Higginbotham and Wilkins 1999). It has been found that non-spoken techniques for achieving intersubjectivity using eye gaze, vocalizations and body movements play a wider and more significant role than for speaking persons (Light *et al.* 1985b; von Tetzchner *et al.* 1996; Dahlgren Sandberg and Liliedahl 2008). Due to these factors, it has been suggested that interactions between aid users and others are probably accomplished in a different manner than interactions between speaking partners (Kraat 1985). In this vein, several studies have focused on the ‘asymmetry’ in interaction, finding that the communication partner, often an adult, dominates the interaction, by, among other things, choosing the topic and taking long turns-at-talk. The AAC communicator has, however, a passive role, mostly communicating in one item elements (Light *et al.* 1985a). Other studies focusing on the practices of VOCA (Voice Output Communication Aid)-use in interaction with peers (Clarke and Wilkinson 2007, 2008) have shown that the sequentiality can be

used as a resource but also as a barrier in understanding VOCA-mediated turns. Organizing VOCA-mediated turns only in specific sequential locations was found to facilitate the understanding of the contributions. Also the influence and role of the communication partner in aided interaction (Harris 1982; Light *et al.* 1985a; Müller and Soto 2002), the influence of the slow pace in constructing contributions (Higginbotham and Wilkins 1999), the modes of communication (Harris 1982; Light, *et al.* 1985b), and the influence on turn-taking and establishing a topic (Buzolich and Wieman 1988; Harris 1982; Higginbotham *et al.* 1988; Kraat 1985; Light *et al.* 1985a) have been studied.

A finding in interactional studies in communication disorders, which is of specific interest to this study, is the use of the so-called 'backchannel turns' (Blau 1986). In analysing the interaction with a non-speaking boy, the present study will also contribute to the ongoing discussion of this type of 'turns'. Research in interactions with severe communication disorders has found so far that there is often a need for multiple turn sequences to construct contributions/'turns'. The speaking communication partner reads aloud the word corresponding to the symbol or word that is indicated by the non-speaking communication partner. The speaking communication partner produces a 'public understanding' of the contribution (Blau 1986; Bloch 2005; Bloch and Beeke 2008; Harris 1982; Higginbotham and Wilkins 1999; Higginbotham *et al.* 1988; Light *et al.* 1985a). Within the Duncan and Fiske tradition (Duncan and Fiske 1977), Blau (1986) studied conversational interactions between adult speakers and non-speaking persons who used alphabet/word boards. She identified a turn at the 'main-channel' level, which consists of the so-called content contribution produced by the non-speaking communication partner and the speaking co-participant (also called 'macro-turn' by Abrahamsson and Ljung 2008). Inside the main-channel turn Blau observed (and categorized) backchannel turns produced by the speaking communication partner (Blau 1986).

Another study of interaction in communication disorders of special interest to the present one was carried out by Bloch (2005). Bloch studied the specific patterns of action in the co-constructing of meaning in acquired speech disorders. Though one of the participants had difficulties in articulating words, he still used speech to communicate. Bloch identified a jointly constructed 'repetition sequence' as part of a 'multi-turn utterance' (cf. Backchannel and main channel turns, above). The repetition sequence consists of a word/grapheme/letter produced by the person with the speech disorder and a repetition of that unit subsequently by the speaking co-participant. Bloch called the second part of the 'repetition sequence' a 'repeat turn' that does a check of understanding and an acceptance of the prior 'turn' as a meaningful unit in the local context. These repetition sequences were found to continue until an agreed



point of ending, where the ordinary speaking co-participant produces either a complete multi-turn utterance as produced by the person with the speech disorder, or an action that demonstrates her/his understanding of the previous sequence of turns.

4 Informants and settings

The data in the present study consists of video recordings. Spoken contributions have been transcribed in accordance with the conventions of Conversation Analysis (Ochs *et al.* 1996) in combination with the proposed transcription conventions in AAC by von Tetzchner and Hygum Jensen (1996). The latter includes non-spoken presumably interactionally relevant action (see Appendix). Some of the participants are native speakers of Persian. A Persian interpreter assisted in the transcription of those parts where a participant is speaking Persian. Every interaction with a different communication partner has been fully transcribed for two minutes.

Interactions between the boy with cerebral palsy and his conversationalists have been recorded in three different settings: at home with the boy and his mother; at home with the boy and his personal assistant and at school with the boy and his classmate. The mother has known the boy all his life. The assistant has known the boy for 1.5 years and the friend has known the boy for three years. The mother has attended a two-day-course in bliss symbolics communication. The personal assistant and the friend have received no formal training.

The boy, Magnus, is 8;6 years of age. He has severe speech and physical impairments owing to cerebral palsy, dyskinetic syndrome. The physical disability affects his four limbs and he uses a wheelchair and acquires assistance for mobility. He has no reported visual or hearing difficulties. At home, the family speaks Persian and at school teachers, assistants and pupils speak Swedish. His speech comprehension (assessed with Språkligt Impressivt Test, SIT, Hellquist (1982), a Swedish normated test of language comprehension) at the age of 6 was found to be on an age adequate level for Swedish. Magnus was tested with WPPSI-III (Wechsler (2005) a test aiming at assessing the intellectual capacity) when he was 5;6 years old and was found to be on an age adequate level. The boy has used a communication board with graphic symbols, called bliss symbolics, for more than five years. There are 584 bliss symbols on the communication board. These are graphic symbols with different colour background, indicating the word class of each bliss symbol. Nouns are yellow, verbs are red, etc. The word referring to the bliss symbol is written above each symbol. The communication board also includes letters and numbers. There are also so called 'indicators' and 'strategy symbols,' used to expand the other

symbols. For example, there is a possibility to indicate verb tense and to indicate the opposite meaning of a word (McNaughton 1985). Magnus accesses the communication board by direct selection with a light pointer attached to his glasses. He attends a mainstream school where there is a unit for children with disabilities. Most of the time though, Magnus goes to a mainstream class.

The interactions were captured simultaneously by three video cameras mounted on tripods. A digital sound recorder was also used to capture audio data (Mp3 format). Each camera was on for three hours in total. At home, the setting was in the living room by the sofa. At school, the setting was in an empty class room. All interactions were naturally occurring except for the interaction with the friend at school that was elicited in the sense that Magnus was asked to choose someone that he wanted to be video recorded with. The participants were told that they could talk about any topic they wished.

Informed consent was attained from all participants. The research project has been approved by the Swedish Ethics Committee (nr: 2009-61) and is registered at the Danish Data Inspection.

5 The organization of the interactions between Magnus and his everyday communication partners

The analysis in the subsequent sections will initially demonstrate that the participants may organize their interactions in turns. Then, analyses will describe different patterns of turn design. These include typically so-called TCU-based turns. Finally, the analysis will demonstrate a turn that differs from the others in that it is not co-ordinated with talk organized in TCUs. Hence, this kind of action is not based on a TCU. Analysis will show that it is still treated as a turn.

5.1 Organizing interactions in turns

As mentioned above, the bliss mediated contributions to the interaction in the data at hand are recognizable as, treated as and thus describable as turns. The analysis will focus on features which are characteristic of turns (-at-talk) (mentioned above) as defined in CA terms, namely:

- I. The fact that possible turns typically address previous turn, do something new and lay out a trajectory for the next turn (Sacks *et al.* 1974)
- II. Actions' recognizability (Schegloff 2007)
- III. Turns' projectability and the occurrence of possible TRPs upon their completion (Sacks *et al.* 1974). Turntaking and primary speakership (Sacks *et al.* 1974; Schegloff, 1982)



Excerpt (1) aims at demonstrating that an action is treated as a turn. The participants, Magnus (M) and the assistant (A) are talking about what they like to eat.

Excerpt 1

01 A: [°är det det som du gillar°]
 gls: °is it that which you like°

02 [((gazes at cbd))]

03 M: [(DU)]
 gls: (YOU)

04 |((smiles))|

05 [(2.8)]

06 A: du≈
 gls: you≈

07 ((≈gazes at M))

08 M: [(ÄLSKA)]
 gls: (LOVE)

09 [(2.0)]

10 A: älskar≈
 gls: love

11 ((≈gazes at M))

12 M: [(VAD)]
 gls: (WHAT)

13 [(2.0)]

14 A: vad≈
 gls: what

15 ((≈gazes at M))

16 M: [(MAT)]
 gls: (FOOD)

17 [(2.6)]

18 A: mat≈
 gls: food

19 ≈[gazes| at M]

20 A: (.) vilken mat jag gillar mmm
 gls: [which food I like mmm]

21 M: |((gazes at A))|

22 |((sticks out tongue))|

23 M: [((looks at cbd X))]

24 |((smiles with open mouth))|

25 [(2.1)]

26 A: jag har ingen favoritmat(0.3)jag gillar en god köttbit (1.0)
 gls: I don't have any favorite food (0.3) I like a nice piece of meat (1.0)

In line 01 the assistant responds to Magnus's previous turn by taking a turn of his own, asking Magnus 'är det det som du gillar' – 'is it that which you like' ('is that what you like'). The assistant produces his turn quietly while he looks at the communication board. Upon the completion of the assistant's turn, Magnus (line 03) points at the bliss symbol *you*. This symbol pointing is voiced by the assistant (line 06). In doing so, the assistant then treats Magnus's symbol pointing as a contribution to the on-going interaction. It is treated as a building block in the construction of an action in a turn in progress. The nature of the building blocks produced by Magnus is of a specific kind. By voicing each building block (lines 6, 10, 14, 18) and gazing at Magnus after the production of each voicing, the assistant orients to the nature of them, not as talk but as *action*. So does Magnus who after the assistant's completion of the voicing of each building block continues his on-going action by pointing at a new bliss symbol. Moreover, by pointing at a new bliss symbol, Magnus treats the assistant's voicing act as a building block too. The specifics of how the contribution of building blocks of this kind is organized in turns will be delineated more thoroughly in Section 5.2.

Furthermore, by voicing this action, that is by articulating the boy's pointing, the assistant integrates Magnus' conduct, action and floor-claiming turn into a TCU. In and through the co-ordination of pointing and voicing then, the co-participants (the assistant and Magnus) co-construct a TCU-based turn. This structure seems to be a recurrent pattern in these data which both participants orient to. The analysis of the co-participants' techniques and the very specific structure that is accomplished in and through them will also be delineated more thoroughly in Section 5.2.

The conduct and actions that the co-participants treat as turns do have some of the characteristics that CA has described for turns-at-talk. These are detailed as follows.

5.1.1 Addressing previous turn, doing something new and laying out a trajectory for the next turn

In excerpt (1) the contribution of the boy 'you love which food' (lines 03–19) is context-sensitive in the sense that it addresses the previous turn ('is it that that you like') that it turns into a first action in an exchange of inquiries about what food the co-participants like respectively. It renews the context as makes new actions relevant as possible next actions and responses to it. Furthermore, it is treated as not only an action but a specific action, namely a question. It is thus also responded to (after the offering of the public understanding 'which food I like mmm') and in and through response treated as that kind of action when the assistant produces: 'I don't have any favourite food, I like a nice piece of meat' (line 26). Hence, the three organizational features of an



ordinary turn-at-talk are also describable features of an ordinary turn in these materials. First, Magnus orients to the prior turn as he expands on the food topic. Second, Magnus contributes with something new to the interaction, in requesting for information about what food the assistant likes. Third, Magnus also makes relevant specific next actions organized in a turn. This relevancy is oriented to by the assistant as he produces an answer to the request with an account of the food he likes. Notice that it is not until line 26 that the assistant takes a turn of his own, that renews the local context that was created by Magnus's turn.

5.1.2 Actions' recognizability

From line 03-18, Magnus produces a sequence of pointings that are voiced by the assistant. The whole sequence adds up to the TCU-based multi-[symbol pointing+voicing] element unit (see Section 5.2 for further analysis) 'you-love-which-food'. In line 20, the assistant then sums up his understanding of the previous sequence of [symbol pointing+voicing] elements, offering an understanding of it 'which food I like mmm'. In this position the 'mmm' can be understood as 'I'm thinking of what to answer' thus holding the floor and indicating an upcoming answer. In line 26, the assistant responds to the whole sequence of [symbol pointing+voicing] elements, thus treating the interactionally accomplished work from line 03-18 as a recognizable action, namely a request for information. The assistant orients to this understanding of line 03-18 by producing an answer 'I don't have any favourite food, I like a nice piece of meat'. Furthermore, the assistant treats the action (the question) as a turn that (a) upon its completion reaches a transition relevant place; and (b) allocates a next speaker during its production. Thus, the next action is not produced till the completion of Magnus's request and the assistant is the one who has been selected as next speaker and the one to produce that next action in his next turn.

5.1.3 Turns' projectability and the occurrence of possible TRPs upon their completion

As already mentioned above, Magnus's contribution seems to allow a projection of: (a) the unit-type, that is what kind of action it is; and (b) when that unit, action and turn will be completed. The assistant takes a turn in line 26 and thus treats this place to be a possible TRP. Ford and Thompson (1996) found three types of cues that converge to define TRPs in conversation. These, apart from syntactic features, are also prosodic features as well as pragmatic features of action completion. A pragmatic completion can be defined as a place where an utterance has a final intonational contour and is interpretable as a complete conversational action within its specific context (Ford and

Thompson 1996). In these data, there are naturally no prosodic cues from the part of the non-speaking participant. Prosody is however, added by the speaking participant when he produces the voicing of each action building block, constructed by Magnus in his turn in progress (see Section 5.1.4). Magnus's pointings do however, have recognizable syntactic features (the words 'you', 'love', 'which', 'food' can be interpreted as a complete sentence). Furthermore, Magnus produces pragmatic cues as he gazes at the assistant in line 21. From an analytic perspective it is noticeable that Magnus does not gaze at the assistant until the completion of the pointing at the bliss symbols ('you', 'love', 'which', 'food'). Thereby he orients to the syntactic projection of the ongoing production of the request *and* hence, to these pointings not as actions and turns, in their own right, but as contributions to the construction of the action and turn-in-progress. Hence, Magnus does not gaze at the assistant till the completion of the syntactic and pragmatic completion of his requesting action that the building blocks contribute to (and the corresponding voicing of the action by the assistant). Magnus's (by the way systematic) gazing at the assistant in this position indicates the relevancy of turn transition (see Sigurd Pilesjö forthcoming).

5.1.4 Turntaking and primary speakership

As mentioned above, turn-transition is accomplished upon the completion of syntactically and pragmatically completed turns. In excerpt (1), Magnus takes a turn by requesting the assistant for information (line 03-18). In the following contribution, in line 20, the assistant sums up the turn-in-progress and then takes a turn-at-talk himself (line 26). Hence at this point, the primary speakership is changed and the participants are thus doing turntaking. The participants treat the contributions of Magnus and the voicing produced by the assistant upon completion of each contribution as building blocks that figure together in the constitution of a syntactically, pragmatically *as well as* prosodically completed action. This action that is constructed across the whole sequence from line 03 to 20 is treated by the participants as one 'full' turn. Furthermore, in and through the turn-allocation carried out by Magnus (line 21) *and* the assistant's voicing, i.e. summing up of this whole action, followed by the assistant's answer to this request for information, the co-participants treat that action as a turn that belongs to Magnus (Ford and Thompson 1996) (called 'macro turn' by Abrahamsson and Ljung 2008).

To summarize, we have shown that the participants may organize their interaction in turns. These turns have features that are similar to those of turns-at-talk (Sacks *et al.* 1974), such as: (a) it is context-sensitive and context-renewing; (b) it is found to be a recognizable action, a request for information. The speaking co-participant, the assistant, orients to this understanding in his



subsequent action and next turn. It is (c) characterized by projectability and arrives upon its completion at a TRP. The TRP is made relevant by syntactic, pragmatic and prosodic (produced by the assistant) cues. Still, the type of turn described in the analysis above differs dramatically from the organization of ordinary turns-at-talk in the sense that they are highly co-constructed and consist partly of non-spoken actions, pointing at graphic symbols among other resources.

The organization of the turns in the data at hand will be explored further in the following sections. The design of the turns can vary and examples of this will be demonstrated in Section 5.2.1

5.2 Organizing interaction in TCU-based turns

The interactions in the data at hand are organized in and through TCUs. Still, the organization differs from building turns through TCUs in ordinary talk-in-interaction. Whereas turns in talk-in-interaction consist of TCUs (see Section 2.2), turns in the data at hand *draw upon* the TCU as a resource among others. The use of these resources are distributed between the participants in such ways that the TCU is not produced by the primary speaker. It is produced by the co-participant. Hence, the primary resource for sense-making in organizing interaction in the turns is not the TCU as in talk-in-interaction. The primary resource is the action conducted by the non-speaking participant who is the primary speaker. The speaking co-participant collaborates with the primary speaker in producing the action and turn. In doing so, he produces talk organized in TCUs. Hence, turns in interactions described above are *based* on TCUs.²

More specifically, the TCU-based turn consists in the data at hand of first, the non-speaking partner pointing at a bliss symbol, and second, the speaking partner subsequently voicing in spoken words his understanding of the pointing, one or several [symbol pointing+voicing] elements. It is a feature of the second action, positioned sequentially next to the first, that it does not carry forward the participants' business in ordinary ways. That is, the second move in the [symbol pointing+voicing] element does not contribute to the development of an ongoing interactional topic. Instead, it contributes to the construction of the non-speaking participant's turn as it makes that turn hearable. Notice also that the assistant's conduct, here called voicing, does not claim the floor and is not treated as claiming the floor. Hence, the voicing act does not exhibit the features of ordinary turns (-at-talk). The voicing act seems rather, to work in ways similar to the so-called backchannel turns or claims of understanding. These consist of short utterances produced by an interlocutor who does not have the 'primary speakership' (Ford and Thompson 1996).



5.2.1 Participants' orientation to turns as TCU-based turns

As mentioned above, the turns in the data at hand consist of, in its simplest form, first, the boy pointing at a bliss symbol and second, the voicing of the word written above the bliss symbol, produced by the speaking co-participant [symbol pointing+voicing]. Thus, a TCU is produced, but the work is done differently than in ordinary talk. Hence, the two participants collaborate in the production of a contribution organized in a turn. The difference to the way a turn is ordinarily produced in talk-in-interaction is that, to use Goffman's term, 'the animator' (Goffman 1979: 17) of the turn changes through the systematic sequential organization of *one* turn across co-participants. The 'author' (Goffman 1979) and the 'animator' are thus not the same person. The TCU-based turns have similarities to the semi-permeable character of some grammatical units of sentence completion (Lerner 1996), in the sense that they are completed by the co-participant in a way that carry the turn forward without the co-participant claiming the floor.

The following excerpts (2, 3 and 4) aim at demonstrating that the co-participants orient to the turn as a unit organized as described above, i.e. organized as a TCU-based turn. Furthermore, the excerpts show that the TCU-based turns may be of different kinds. A TCU-based turn may for example consist of one or more [symbol pointing+voicing] elements.

The following excerpt (2) demonstrates a TCU-based turn in its simplest form. It shows that and how the speaking co-participant, Magnus's friend (F), voices what Magnus is pointing at. Furthermore, it demonstrates and that this is the unit, the [symbol pointing+voicing] element, the co-participants orient to.

Excerpt 2, a [symbol pointing+voicing] element, a 'lexical unit':

```

07 M:   |   DÖD   |
      gls:   DEAD
08     [ (4.5) ]
09 F:   död.≈
      gls:  dead.≈
10           ≈ ((gazes at M and smiles))
11 M:   ((gazes at F and smiles))
12     [           (1.5)           ]

```

Magnus points at the bliss symbol DEAD (line 07). The friend responds to the pointing by voicing the word written above the symbol, DEAD (line 09). Then the friend gazes and smiles at Magnus who on his part smiles and gazes



at his friend. Thus a mutual gaze is achieved in line 11. The gazes and smiles are not produced next to Magnus's pointing by any of the participants. They are produced next to the friend's voicing and prior to a produced pause (line 12). In and through the production and positioning of reciprocal gazes and smiles at this point then, the co-participants treat the work done (lines 07 and 09) as finished, as a mission completed. The mission is a process of sense-making. This process consists of an act of pointing and an act of voicing. Both are treated as features that figure together in the constitution of a recognizable sense-making action. This action is furthermore treated as a turn. In and through the act of voicing, the friend namely does not claim the floor, neither does she carry forward the interactional business at hand. She carries forward the action-in-progress which is initiated by Magnus.

Excerpt (2) demonstrated a TCU-based turn in its simplest form, one [symbol pointing+voicing] element. Excerpts (3) and (4) below aim at exemplifying other types of TCU-based turns in which namely 'clauses' (excerpt 3) and 'sentences' (excerpt 4), that is syntactic units are constructed. In excerpt (3) and (4) the participants use the same method of constructing the [symbol pointing+voicing] element as in excerpt (2), but they combine several [symbol pointing+voicing] elements into the TCU-based turns. The excerpts (3 and 4) demonstrate however two different ways in which the TCU-based turn is constructed as a combination of several elements.

In the following excerpt (3) Magnus and his mother (MOT) are talking. His mother has just asked Magnus if a person, who the mother is trying to identify, is at their home right now.

Excerpt 3 with two [pointing+voicing] elements in a TCU-based turn, a 'clause':

```

01 M:      |(ALLA) |
02          |(6.0) |
03 MOT:    alla~
          gls: all
04          ~((gazes at M))
05 M:      ((moves light pointer from ALLA))
06 M:      [ °eeh° ]
07          |(DAG)
          gls: |(DAY) |
08 MOT:    |((gazes at cbd))|
09          |(5.3) |
10 MOT:    alla dar.
          gls: all days.

```

Magnus points at the bliss symbol ALLA – ALL (line 01). His mother responds by voicing ‘alla’ – ‘all’ (line 03). As is typically the case and as demonstrated in the excerpts (1 and 2 above), the speaking co-participant, here the boy’s mother gazes immediately back at Magnus upon completion of the voicing. As is also typically the case (and as it was also shown in excerpt (1)) the non-speaking participant, Magnus does not gaze at this point the speaking participant doing the voicing. Upon his mother’s completion of the voicing, Magnus instead points at the next symbol DAG – DAY (line 07). Notice that Magnus does not move his light pointer from one symbol to the next until after the speaking co-participant has voiced the previous symbol. In waiting, before pointing at a new symbol, he seems to orient towards the voicing of his co-participant as something that should occur in this position.

After Magnus has pointed at the bliss symbol DAG – DAY, his mother responds – again – by voicing (line 10). However, this voicing differs from the kind we have seen so far. In this case, the speaking co-participant, the mother, sums up two bliss symbols which were made relevant by Magnus: ‘alla dar’ – ‘all days’. The mother thus treats the lack of gazing by Magnus as an indication that the action has not reached a completion yet. She deploys a practice of voicing together elements which she thus ascribes projectability to. Hence, the mother combines the relevant made bliss symbols in a clause. It is worth noticing that she also adjusts the syntax so that the clause becomes a correct clause in Swedish. This is achieved by changing DAG – DAY to ‘dar’ – ‘days’ to fit it together with ALLA – ALL. The mother thereby displays that the words go together by voicing them together and adjusting them syntactically.

The clause is produced with a pitch drop at the end which indicates the assumption or suggestion that the TCU-based turn is finished. The practice of ‘doing a clause’ is recognized and treated as a relevant method for sense-making in this context by Magnus. He namely gazes at his mother upon completion of the produced clause when she does a summing up (not in the transcript). This practice indicates that the main unit is complete. This was also demonstrated in excerpt 1 (line 21).

In the excerpt (4) below Magnus and the assistant are talking about what food they like. The same method of [symbol pointing + voicing] which is demonstrated above is deployed. In excerpt (4) however, the co-participants construct a multi-[symbol pointing+voicing] element unit. Hence, the TCU-based turn is constructed with multi [symbol pointing + voicing] elements and is built up step by step.

Excerpt 4 with multi-[symbol pointing+voicing] elements, a ‘sentence’:

06 M: |≈ (X) |
 07 |(2.7)|
 08 A: Magnus ((continues to gaze at cbd))
 09 M: [((sticks tongue out, still gazing at cbd))]
 10 | (ÄLSKA) |
 gls: (LOVE)
 11 | (3.4) |
 12 A: älskar≈
 gls: loves
 13 ≈((gazes at M))
 14 M: ((still gazing at cbd))
 15 M: [(PASTA)]
 16 | (3.3) |
 17 A: pasta?≈
 18 ≈((gazes at M))

In line 06 Magnus points at a bliss symbol *X* in the area of pronouns, possibly *JAG/MIG (I/ME)*. The assistant responds to this pointing by voicing 'Magnus', the boy's name, not changing the direction of his attention which is already on the communication board.³ Magnus sticks out his tongue and continues to point at the next symbol *ÄLSKA-LOVE* (line 10). Again as is almost conventionally the case, the assistant voices 'loves' and gazes immediately back at Magnus. Again and typically, Magnus does not gaze back at the assistant, but instead continues to point at the next symbol *PASTA* (line 15). The assistant responds to this by voicing 'pasta' (line 17).

Thus, also in this excerpt, the participants indicate with their gaze whether the action (and turn)-in-progress is terminated or not. In this excerpt, the assistant indicates in a manner that has not been described so far that he is ready to continue Magnus's turn: In line 08, the assistant does not gaze back at Magnus as he does in the following voicings of the words 'love – pasta'. Instead, the assistant makes use of the technique (1) of staying oriented to the communication board. Other techniques that differ from the ones described so far are (2) the fact that the assistant when doing the voicing act changes the pointing at the bliss symbol 'I' to the boy's first name, Magnus. This is presumably done to avoid a misunderstanding about who the referent is. Obviously, as a consequence hereof the assistant – as did the mother in excerpt 3 above – transforms the pointing at the word *LOVE* (the infinite form) to 'loves', hence adjusting the verb from the infinite form to the present tense, fitting the words 'Magnus and loves' together. (3) The assistant combines the symbol pointings across acts of voicing (lines 08, 12, 17). The assistant, in other words, does not combine them as he sums them up in one act of voicing as did the mother in excerpt (3).

To summarize this section, the method of pointing at a bliss symbol and voicing [symbol pointing+voicing] is a recurrent pattern in these data. There seems to be a fundamental unit consisting of one or several [symbol pointing+voicing] elements - a TCU-based unit - that the co-participants orient to when building turns. The TCU-based turn can as demonstrated above be constructed in different ways, as a one-[symbol pointing+voicing] element unit or a multi-[symbol pointing+voicing] element unit, but the practice of pointing at a bliss symbol and voicing stays however the same in these excerpts. These build up different 'kinds of' TCU-based turns and different methods are deployed to construct them. Methods of not gazing by the boy are used to project a continuation of the turn.

The roles of the participants differ from ordinary talk-in-interaction where the roles of speaker and listener are typically more separated. In these data when the listener is the speaking participant, he is not only the listener but also the animator of the other participant's talk. As mentioned above 'the animator', in Goffman's terms, has changed, in the manner that the author and animator are distributed between the non-speaking boy and his co-participant. However, the role of the animator is more extended than just to voice exactly the item that is pointed at. As shown above, the speaking co-participant, in addition to voicing, adds intonation and also fits words that go together and changes the syntax of the words into conventional syntax. In addition, the speaking co-participant also takes measures to avoid misunderstandings about who is referred to (as in excerpt (4)). The speaking co-participant may also do a summing up of the understanding. The speaking co-participant does apparently employ methods for not only making the turn intelligible but also understandable (cf. Bloch and Wilkinson 2004). Although the roles of the participants differ from ordinary talk-in-interaction, the roles of the 'primary speaker' - conversational floorholder - and the listener seem agreed on and unproblematic. In the construction of TCU-based turns, in these materials, the non-speaking participant, Magnus, is 'primary speaker'. The speaking co-participant, the assistant, is the listener.

5.3 Organizing interaction in a non-TCU-based turn

Apart from turns which can be described as TCU-based (see above), we have also found a few instances in these materials in which turns are not based on TCUs. One of these will be explored in excerpt (5) below. The characteristic feature of such turns is that the non-speaking participant does a pointing that is *not* followed by a voicing by the speaking co-participant. The turn is then a non-TCU-based turn in the sense that it lacks the practice of voicing by the speaking co-participant following the pointing of Magnus. Interestingly, these turns are still treated and recognized as sense-making turns by the participants.



Excerpt 5 starts when Magnus has just asked the assistant (A) what animal he loves.

Excerpt 5, a non-TCU-based turn:

```

01 A:   inga
      gls: none
02      ((shakes head and gazes at M))
03 M:   [((smiles, and turns head and light pointer towards cbd))]
04 A:   |((follows light pointer with gaze ))|
05      [                               (3.2)                               ]
06 A:   dom hårar för mycket
      gls:   they lose too much hair
07 A:   [ >°jag tycker inte om dom°< ]
      gls:   >°i don't like them°<
08      | (( gazes at cbd)) |
09 M:   |(points at yellow symbol, an animal x)|
10      [                               (0.9)                               ]
11 A:   nej~
      gls:   no ~
12      ~((shakes head))

```

In line 01 the assistant responds to Magnus's question by replying 'inga' – 'none'. He emphasizes this by simultaneously shaking his head. After 'none' Magnus treats this point as a TRP and initiates a new turn, moving his light pointer to a symbol in the area of animals. In this position, he may start to point at the symbol 'dog' for example. Since there is no voicing done by the co-participant, however, we cannot know which animal he is pointing at. What we do know is that he is pointing in the area of specific animals.

When Magnus in line 03, moves his light-pointer to a symbol, the assistant on his part initiates a new turn as he produces a TCU, 'they lose too much hair' (line 6). The assistant then continues his turn by constructing a second TCU 'I don't like them'. Simultaneously with the initiation of the turn, 'they lose too much hair' (line 06), the assistant follows Magnus's pointing at the communication board, with his gaze. The assistant thus displays continued reciprocity. This is manifested when the assistant produces the second TCU of his turn 'I don't like them', more quietly and quickly. The lowered voice and quick talk is employed simultaneously with Magnus's actual pointing at a symbol (line 09). Thus, the assistant seems to orient to an 'overlap' (in lines 07-09) between his talk and Magnus's pointing (lines 07-09). As in line 1, the assistant then (in line 11) responds to Magnus's 'pointing act' (line 9) with a 'nej-no'. That is, the assistant does not voice the indicated symbol. Hence, the second part of the [symbol pointing+voicing] element and in this case

also the TCU-based turn is not being produced. As described in the previous section, the [symbol pointing + voicing] element is otherwise a recurrent pattern in these materials. In and through responding in his subsequent turn, the assistant treats Magnus's conduct – the pointing act – as an action and a turn, though in a different way. The assistant treats the previous pointing as a complete turn, a request for information (maybe whether he likes a specific animal, for example a dog), as he produces a response to it ('no') at the possible completion of the action, namely the actual 'hitting'/'reaching'/'pointing' at the symbol with the X. The assistant combines this response with a head shake. Hence, Magnus's turn is organized as a *non-TCU-based turn*, a simple act of sense-making pointing.

6 Discussion

CA has so far mainly studied talk-in-interaction. Hence, fundamental CA concepts emerge out of analyses of spoken interaction. Concepts for studies of interactions as the ones described in this article should also emerge out of analyses of them as interactions in their own right. However, a comparison to conventional CA concepts and findings is worth discussing.

6.1 Turns and other CA terms

According to several authors (Hutchby and Wooffitt 2008; Steensig 2001) it is not part of the conversation analyst's aim to define what a turn construction unit is, that is a members' problem. In this study, the participants seem to agree on treating and understanding conduct that is organized in specific ways as actions and as turns. These turns can share several features with a spoken turn as described in CA terms. However, the turns in the materials at hand, or crucial contributions to the turns, are not spoken and not oriented to as turns-at-talk. They are organized in different ways. The co-participants in these materials accomplish the production of turns and actions which we have described as TCU-based or non-TCU-based. Both kinds share features with spoken turns as described in CA terms.

6.2 TCU-based and non-TCU-based turns

The interaction in the data at hand is organized in TCU-based and non-TCU-based turns where the TCU-based turns seem to occur more frequently. The TCU-based turns consist of one or several [symbol pointing+voicing] elements. These are jointly constructed by the co-participants in a specific pattern that both co-participants orient to. The TCU-based turn does, through the voicing act make the action hearable and in that sense the voicing act contributes to construct projectability of a TRP. The TCU-based turns add the



projection cues of prosody and grammar. Prosody is added by the voicing by the speaking co-participant. Grammar is added as the speaking co-participant can merge the boy's pointings (at bliss symbols) together into a sequence of words, a clause or a sentence. It also adds the possibility to adjust the morphology into 'correct' Swedish. The voicing act is done by the speaking co-participant who in this way has an extended role. Hence, the TCU-based turns have features which are similar to an ordinary TCU. In addition, the act of voicing gives the TCU-based turn a public understanding of the non-speaking co-participant's turn and consequently may give the non-speaking participant an opportunity to make a repair. In other words, the act of voicing makes the TCU-based turn hearable and in that sense it can give the possibility to identify a trouble source.

Apart from TCU-based turns, one non-TCU-based turn is demonstrated (see excerpt (5)). The non-TCU-based turn differs from the TCU-based one in that it is not co-constructed in the way that a TCU-based turn is. It lacks for example the prosodic and grammar cues to project a turn completion. The projectability of it is in that sense 'weaker' than in the TCU-based turn. The non-TCU-based turn shares with the TCU-based one, the feature of sequentiality. This feature, of course, is a resource for projecting completion of a turn – be it TCU-based or not. Furthermore, it should be noted, that the non-TCU-based turn also differs from the non-spoken building block, the symbol pointing, in the TCU-based turn. It is responded to differently. The symbol pointing in the TCU-based turn is followed by the voicing act which does not claim the floor and which does not construct a *response to* the pointing act, as do responding turns-at-talk to the non-TCU-based turns. In other words, the participants treat voicing as an element in the construction of a turn in progress. In contrast, the symbol pointing in the non-TCU-based turn is responded to by a turn-at-talk by the speaking co-participant. The turn-at-talk is floor claiming as a sequentially next action that *responds to* the previous non-spoken one.

Interestingly, most of the turns in this analysis are TCU-based and thus do not lack the grounding feature of grammar. They are organized in such ways that grammar becomes a resource (amongst others) for sense-making. This finding is noticeable, since it is a known clinical experience and research finding that grammar is otherwise, often lacking (von Tetzchner and Martinsen 1996) in aided AAC contributions. Mostly single word utterances are produced. Since one of the main functions grammar has is to project a TRP (Schegloff 1996), this can indicate that TRPs may be a problem for participants, if grammar, as normally perceived, is absent. As Sacks *et al.* (1974) stated, the TCU may not be usable in the same way if the feature of projectability is lacking. It is a known phenomenon in the AAC field that formal AAC-

systems, such as bliss communication boards, tend not to be used with every day communication partners (von Tetzchner and Martinsen 1996). One can then put the question of whether there is a lack of employed techniques for producing, recognizing and thus locating TRPs amongst AAC-users and their co-participants. Techniques such as, or similar to, the ones described in this paper.

In the data at hand, it is observed that the non-speaking boy can deploy other embodied resources such as gaze direction, to mark a beginning and a completion of a turn. These resources could prove to be crucial if other cues for projecting a TRP are lacking (see Sigurd Pilesjö forthcoming). The participants also use methods to project a continuation of a turn, thus, they project that the TRP is not reached yet: so Magnus's deployment of, for instance, resources such as 'not gazing' at the speaking co-participant is observed to be one method to project that his turn is in progress and has not reached its termination yet. In addition, some pointed at bliss symbols are more likely than others to project a continuation of the turn in that specific context. An example from the presented excerpts above is when the boy's mother asks 'that person ..., is s/he here now' (not in transcript) and the boy responds by pointing at 'all' 'day'. The word 'all' projects that there is something more to come. The intonation of the speaking partner's voicing seems to show the orientation of the speaking partner to this practice (Schegloff 2007).

6.3 Primary speakership and the role of the speaking co-participant

In the data at hand, the non-speaking participant can have the primary speakership even though the speaking co-participant is doing the actual 'talking'. There seems to be a clear division of roles where one person at a time can have the primary speakership, the conversational floor, until primary speakership occurs. However, the labour is distributed differently than in ordinary talk-in-interaction. The speaking co-participant gives voice to the visual indications of the AAC user thereby constructing TCUs by voicing and adding prosody. S/he fits the elements together and adjusts the syntax. S/he can also change the referent, to avoid confusion of whom he refers. In that sense, the speaking co-participant takes strongly part in the production of the non-speaking participant's turns. The method of co-construction and the practices the participants employ seem to make the interaction work more smoothly. It adds to the efficiency of the interaction in that each bliss symbol pointed at can be heard (and repaired if needed) on an online basis, because the potential trouble source is specified directly and misunderstandings can be dealt with immediately.^{4,5}

The two acts consisting of pointing at a bliss symbol by the non-speaking co-participant and the voicing by the speaking co-participant, seem both to be



important in the production of primary speakers turn. The 'symbol pointing' indicates a word or a range of words. The 'voicing act' gives the possibility of an immediate understandability check, and a possibility to do a repair (if the voicing and the other work done by the speaking co-participant is not done to the satisfaction of the non-speaking co-participant and the primary speaker). Bloch (2005) calls, what in this study is called a [symbol pointing+voicing] element, a 'repetition sequence'. He gives the 'repeat' (here called 'voicing' and 'the voicing act') in a given sequence the status of a turn. As analyses in the present article suggest, the voicing act - opposed to Bloch (2005) - does not have all the features of a turn as defined in CA terms. Rather, the participants treat them as building blocks in a TCU-based turn in progress, of which the non-speaking participant, the AAC user, is the primary speaker.

7 Conclusions

The findings in this study suggest that the participants can organize their interaction in turns and turntaking although the non-speaking participant's turns are not ordinary turns-at-talk. The participants can organize the interaction in and through turns, achieving social interactional structure and thus understanding. These turns orient to ongoing activities in the talk and are thus context-shaped (although the specific relations to this context are not analysed in detail here). The turns are regarded as recognizable actions by the participants and are responded to in the next turn, thus being context-renewing. Projectable TRPs can occur and there is a shift in primary speakership, i.e. turntaking occurs.

However, the turns which the participants orient to differ dramatically from turns in ordinary talk-in-interaction. They are organized in TCU-based (voiced) turns and non-TCU-based (non-voiced) turns. Several kinds of turn design are demonstrated. The TCU-based turn consists of one or more [symbol pointing+voicing] elements. Hence, the speaking co-participant voices and by that contributes to the production of the non-speaking participant's turn in progress by constructing a TCU.

The speaking partner's role is different from the one in ordinary interaction. Apart from being the ordinary co-participant of the non-speaking partner, s/he is the animator of the non-speaking co-participant's turn and is also doing several other important jobs. S/he fits words that go together into a clause and a sentence. S/he can sum up her/his understanding of the turn and also add prosody to the non-speaking participant's turn in progress. The speaking co-participant also does work to avoid confusion of whom they are talking about. One can say, following Goodwin *et al.* (2002) that the ecology of the semiotic resources in the interaction is changed. As a consequence, the

speaking partner takes a greater responsibility in the interaction. This study provides additional support for the observation that the communication disability does not lie in one individual but in a way of being in concert with others in a socially organized practice (Goodwin 2003).

There is a need for future research on naturally occurring interaction with people who use AAC. Detailed sequential analysis can demonstrate that non-typical interaction differs from ordinary interaction but is still orderly. Ordinary interaction and nontypical interaction share several features. However, studies of AAC interaction can also give new insights to CA. In exploring the use of a communication board in interaction, the basic concepts of CA are challenged, especially when coming to terms with participants' non-spoken actions. New concepts as TCU-based turns and non-TCU-based turns can be useful in characterizing aided interaction.

Furthermore, the findings can also increase the knowledge in the field of both AAC theory, assessment and intervention suggesting that the definition of AAC should focus more on the dialogical and collaborative nature of the interaction (Clarke and Wilkinson 2007). In addition, insights may be used in the development of AAC technologies. The findings in this analysis demonstrate that the communication partner plays an important role in constructing TCU-based turns of the non-speaking co-participant. Maybe that is one of the reasons why high-technology AAC-systems with speech output are used to a little extent (Brekke and von Tetzchner 2003). So far, the high technology systems do not seem to be able to do all the jobs that the human communication partner can do. In contrast, this study finds that the interaction between a non-speaking boy using aided AAC and his co-participants is characterized by a great deal of co-construction and is built through coordinated social practices. The participants in the data at hand orient to these practices and the roles they take seem to be quite fixed and agreed on by the participants. Although the interaction can be challenged by the fact that one of the co-participants is unable to talk, the co-participants still collaborately agree on and deploy resources and practices in the online process of interaction in an orderly way.

8 Clinical implications

Due to the heterogeneity of AAC modalities and the participants in AAC research, care should be taken when generalizing from the findings in the present study. Nevertheless, the following points can be of importance for clinical practice.

Awareness of how turns can be built up and the resources and methods which are used can be important to look for in assessment and interven-



tion. Raised awareness of this on behalf of the communication partner could increase the effectiveness and a feeling of assertiveness in interaction. Many people who are new to AAC-interaction, as for instance new assistants or hospital staff, do not know how to interact with individuals using AAC and may in some cases even avoid it. Awareness of how it is organized may develop the confidence of new communication partners (Bloch 2011).

Awareness of the role of the speaking co-participant is also essential both in intervention and when designing new assistive technology. In intervention, the clinician and the participants can review how turns are organized and designed through the use of video. When training new staff, it can be useful to focus on the different jobs that the speaking co-participant can do. Awareness of the high degree of co-construction of a turn can make the interaction work more smoothly. In addition, the awareness of the importance of the voicing act can add to the efficiency of turn construction. The speaking co-participant can, in addition to voicing, adjust syntax and morphology and add prosody. S/he can change a word to avoid confusion about to whom it is referred. S/he can also sum up an understanding of the non-speaking participant's turn. In short, the speaking co-participant can add and contribute to the understandability and efficiency of the interaction. However, this should be done with great sensitivity to the non-speaking co-participant. S/he is primary speaker or rather, primary owner of the turn and thus of the understanding of the world which is embedded in the turn.

A misunderstanding that sometimes exists is that AAC interaction is just like ordinary talk-in-interaction (Heister Trygg *et al.* 1998). This seems to be a too simplistic way of looking at interaction when you take this analysis (and others of the same kind) into account and compare it to ordinary talk-in-interaction. Both participants' interactional practices are influenced by the fact that one partner is not speaking and by the used artefact, namely the communication board. In intervention it is an advantage to be aware of what resources are used to achieve a turn. These are often phenomena that are seen but not noticed.

When somebody uses a communication board it is often said, in the AAC field, that there needs to be an 'interpreter' (Blau 1986). That interpreter can be a separate person to the communication partner. The role of an interpreter is to give a voice to the non-speaking co-participant. (In Sweden there actually exists an 'interpreter service' in some parts of the country (Larsson and Thorén-Jönsson 2007).) The data at hand can clarify the interpreter's role.

Finally, for clinicians, the findings in this study indicate that intervention should focus on both the non-speaking participant and his or her speaking communication partner. This is supported by other recent recommendations for clinical practice (Blackstone *et al.* 2007).



Notes

1. Different techniques of initiating and completing turns are also deployed. These will be further explored in Sigurd Pilesjö (forthcoming).
2. The turns may have a pre-beginning element which occur prior to the voiced TCU-based turn. The TCU-based turn can also be followed by a post-completion marker. The features of prebeginning and post-completion markers will be further analysed in Sigurd Pilesjö (forthcoming).
3. In the transcript it is marked X. Even if it is not visible to the analyst that Magnus is pointing at *JAG (I)*, it is assumed, due to the fact that Magnus points in the area of pronouns and Magnus does not have the word 'Magnus' as a separate symbol on his communication board (Excerpt (4), line 6 and 8).
4. The finding that the turns are mainly done in joint construction is also found in other studies of non-speaking persons using augmentative and alternative communication (Buzolich and Wiemann 1988; Clarke 2005; Higginbotham and Wilkins 1999; von Tetzchner and Martinsen 1996) and people with aphasia and dysarthria (Bloch and Beeke 2008; Goodwin *et al.* 2002; Lind 2001).
5. The analysis in this paper focuses on unproblematic interaction. However, we did find instances, in the materials, that seem problematic to the participants. These phenomena need to be analysed in future research.

About the Authors

Maja Sigurd Pilesjö, Speech and Language Therapist, MSc, Ph.D-student, Center for Social Practices and Cognition, Institute of Language and Communication, University of Southern Denmark, Campusvej 55, DK-5230 Odense m, Denmark. Email: msp@language.sdu.dk. Maja Sigurd Pilesjö has worked as a Speech and Language Therapist in the field of Augmentative and Alternative Communication (AAC) for 25 years. At present, she is doing a Ph.D-project on interaction in AAC.

Gitte Rasmussen, Associate Professor, Ph.D, Center for Social Practices and Cognition, Institute of Language and Communication, University of Southern Denmark, Campusvej 55, DK-5230 Odense M, Denmark. Email: gitter@language.sdu.dk. Gitte Rasmussen (Ph.D) is employed as an associate professor at the Institute of Language and Communication. She is director of the research Center for Social Practices and Cognition (SoPraCon). Her research interests are Ethnometodological and Conversation Analytic studies of everyday life of ordinary ((dis)abled) people, Interaction and Cognition, Institutional Interaction.

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PAPER II

On the use of bodily action and vocalizations as resources and methods when claiming and completing turns in aided interaction

MAJA SIGURD PILESJÖ

Abstract

This is an investigation of methods to manage turn-taking in aided AAC. It is a case study where interaction between a boy with severe speech and physical impairment (SSPI) and his everyday communication partners is investigated. The principles and practices of Conversation Analysis (CA) are used to transcribe and analyze interaction, between a boy with SSPI, due to cerebral palsy, and his assistant and the same boy and his friend. The boy augments his communication with Blissymbolics on a communication board. The use of bodily action and vocalizations, jointly employed with the formal AAC mode, are explored in the contexts of turn pre-beginnings and turn post-completions. The aims are to identify and analyze the features of these resources and the turn constructional practices as they occur in natural conversation with everyday communication partners. The findings indicate that the participants orient to specific practices using bodily action and vocalizations to initiate and complete a turn. These practices seem to be crucial in managing the turn, as methods for turn transition. The analysis highlights the importance of understanding how aided interaction works in everyday settings, how other modalities work in concert with the formal AAC mode and what role the communication partner plays for the construction of communicative space. These results may have implications for clinical intervention.

Introduction

This is a case study of interaction between a boy and his everyday communication partners. It is an investigation of how visible bodily action, such as gaze direction, and vocalizations are used together with the formal AAC mode to manage turn-taking, to initiate and to complete a turn.

Here vocalizations refer to vowels in varying pitch, intensity and duration, occasionally together with a consonant (e.g., [e::a::h:]) and bodily action refers to eye gaze direction (e.g., the boy's gaze direction towards the assistant), facial expression (e.g., a smile or an opening of the mouth), head movement

(e.g., a nod or shake), arm and hand movement (e.g., an arm hitting the table) and other body movements (e.g., moving the torso backwards) when used as ways of managing turn transition. Note that bliss indications are not included in bodily action.

In ordinary spoken interaction, other bodily produced resources are deployed naturally in coordination with talk. These resources are used as methods to accomplish many different functions in interaction (e.g., Goodwin, 1981; Streeck & Hartge, 1992; Streeck, 2003). Gestures can for example prefigure semantic content and be employed in turn transition. In addition, gestures may enable the current speaker to give a preview of an upcoming next unit (Streeck & Hartge, 1992). Different practices of gaze have been shown when turns are initiated (Goodwin, 1980, 1981; Kendon, 1967) and when turns are completed (Kendon, 1967).

Interaction is likely to be accomplished in a different manner when one of the participants is unable to speak (Kraat, 1985). Interaction which is challenged by impairment of at least one of the participants will in the present study be called *challenged interaction*. Expressions such as eye gaze, vocalizations and body movements probably play a wider and more significant role than for speaking persons (Light, Collier & Parnes, 1985c; von Tetzchner, Grove, Loncke, Barnett, Woll & Clibbens, 1996; Dahlgren Sandberg & Liliedahl, 2008). Additionally, if the person has a motor impairment, involuntary movement might appear (Kraat, 1985; Higginbotham, Mathy-Laikko & Yoder, 1988). Furthermore, the ability to make voluntary movements, to make a gesture for example, can be limited (Clarke, 2005). Finally, the fact that an artefact as a communication aid is used, might have consequences for the interaction (Mathy-Laikko & Yoder, 1986).

Previous studies in the field of AAC have shown that bodily action and vocalizations play a dominant role in the person with SSPI's communicative expressions (Harris, 1982; Light et al., 1985c; Ferm, 2006; Blackstone & Hunt Berg, 2008). Light et al. (1985c) found a connection between the mode of communication, the discourse status and communicative function. Confirmations and denials were expressed mainly by vocalization and gesture. Other studies have found that resources, such as vocalizations and bodily action, were used to initiate topics and episodes (Ferm, 2006; Light et al., 1985c). Further exploration of the interrelationship between the formal AAC mode, for example graphic symbols, and the natural resources such as bodily action and vocalizations has been recommended (Light et al., 1985c).

In a conversation analytic study on interaction between children using

Voice Communication Output Aids (VOCAs) and their peers, Clarke (2005) also found that vocalizations and 'non-verbal' actions were used more frequently and in creative and different ways than in ordinary interaction. Confirmations and rejections were made 'non-verbally' on a more regular basis. In addition, the children using communication aids were found to use 'non-verbal' methods when managing the turn. Head movements and shifts in body posture were used in initial and final position of VOCA-mediated turns. This sequential placement of vocalizations and 'non-verbal' actions was used as a method for displaying a stance to the talk in progress by the child with SSPI.

The present chapter consists of an investigation of how bodily action and vocalizations are employed as *methods to manage the turn* in interaction in which aided AAC modes are used. The intention is to examine which resources are employed and how they are organized together with the formal AAC mode in turn transition. The focus is on the participants' use of bodily action and vocalizations as methods for turn transition; to initiate and complete a turn. In doing so, the interaction between a boy, here called Magnus, and his everyday communication partners will be analyzed. Magnus is a boy with severe speech and physical impairment (SSPI) due to cerebral palsy. Magnus augments his communication with graphic symbols, Blissymbolics (McNaughton, 1985).

The principles and practices of Conversation Analysis (CA) are used to analyze the conversational data at hand (Heritage, 1984; Ten Have, 2007; Hutchby & Wooffitt, 2008). CA has been used to analyze visible bodily action as they combine with and complement ordinary talk, but often one resource at a time rather than multiple resources simultaneously. (Steensig, 2001). In line with recent research (Goodwin, 2000; Streeck, 2003; Kendon, 2004; Rasmussen, 2010), the present study takes into account the simultaneous use of multiple resources used by the participants.

Turns in ordinary interaction

When analyzing turn pre-beginnings and post-completions in aided interaction, a germane issue is, of course, how to define the sequential unit that is begun and completed. In traditional CA such a unit has been understood as a *turn-at-talk*. Turns are in this tradition shown to be built out of one or several units, called turn constructional units (TCU). TCUs may correspond to various linguistic phenomena, such as sentences, clauses, phrases, words or particles, but also prosodic units with varying linguistic content. Speakers use

TCUs to construct projections during turn construction, which make possible for the co-participants to project the sort of unit under way, what action it may achieve, and when that unit/action may be completed (Schegloff, 1996; Hutchby and Wooffitt, 2008). Turns-at-talk orient to ongoing activities in the talk and are thus context-shaped. Turns are also regarded as recognizable actions by the participants and are responded to in the next turn, thus being context-renewing. Projectable transition relevance places (TRPs) are systematically designed, which may or may not result in a shift of primary speakership, an ongoing interactive process referred to as turn-taking.

Turns in challenged interaction

Conversation analytic studies of turn-taking in interaction that is challenged by the participation of persons with SSPI are sparse, and not specifically concerned with pre-beginnings or post-completions. In a recent study, Sigurd Pilesjö and Rasmussen (2011), explored the communication board-mediated interaction between a young boy and his everyday communication partners, and investigated turn organization and turn design. They argued that the participants are able to organize their interaction in and through turns similar to turns-at-talk in that they are context-shaped and context-renewing. They are also regarded as recognizable actions by the participants and speakershift may occur. However, the turns also differ from turns in ordinary talk-in-interaction in the sense that they are more overtly co-constructed units: the user of AAC modes points at a bliss symbol that is given voice by the speaking co-participant in the following sequential slot. The turns may consist of one or several of these symbol pointing and voicing elements. Sigurd Pilesjö and Rasmussen also argued that the voicing by the co-participant provides prosody to the turn, and that grammar is provided when the co-participant merges single pointings (at bliss symbols) together in spoken sequences of words, or in spoken grammatical units such as clauses or sentences.

The voicing, mentioned above, is one example of co-construction in communication board-mediated interaction. Repairing questions and confirmations are other examples of the co-constructive nature of communication board-mediated interaction. Apart from co-construction as a main characteristic, another main feature is that non-spoken linguistic resources play a more prominent role in the construction of turns in the process of AAC. These are resources like symbol indications, letter indications, and different types of linguistically referring pointing gestures at persons or objects in the situation.

Turns that are constructed by the use of a communication board (in combination with other resources) will henceforth be labelled communication board-mediated turns (CB-mediated turns). This is congruent with Clarke and Wilkinson's (2007, 2008) use of the term VOCA-mediated turn which refers to turns produced with a VOCA (voice output communication aid).

Turn pre-beginning elements in ordinary interaction

Kendon, as early as in 1967, showed that gaze direction is systematically deployed in turn-taking (Kendon, 1967). Typically, the speaker seeks to achieve mutual gaze at the beginning of his/her turn (Goodwin, 1980). Having achieved mutual gaze, the speaker is more likely to look away from the listener at the beginning of a turn and is more likely to *look at* the listener at the end of a turn. Goodwin (1981) and Psathas (1990) reported similar findings. The beginning of a turn is often preceded by pre-beginning elements (Schegloff, 1996). These elements are actions that project the onset of talk. The pre-beginnings can be spoken, but may also be displayed in other ways. Common resources of a turn pre-beginning are behaviours like a turning of the head and gaze direction, a facial expression, lip-parting, a clearing of throat or an inbreath. Just inside the beginning boundary there is also a practice functioning in such a way that if the speaker does not have the recipient's gaze, the speaker may break the continuous phonation of his talk, which usually attracts the gaze of the recipient. After the recipient's gaze is attracted, the TCU can be repeated by the speaker, i.e., the speaker can do a restart (Goodwin, 1981). In multiparty interaction, gaze direction and naming are two resources that are often used in the pre-beginning and beginning phases of a turn (Lerner, 2003). Gestures are often used, as well, in the context of turn transition or pre-speech onset (Streeck & Hartge, 1992).

Turn pre-beginning elements in challenged interaction

Previous research has found that persons with SSPI initiate topics and episodes less than their speaking communication partners (Calculator & Dolaghan, 1982; Light et al., 1985a; Higginbotham et al., 1988). Despite this, the initiations that are produced are likely to be accomplished by bodily action, such as gesture, and vocalizations (Light et al., 1985c, Buzolich & Weimann, 1988; Ferm, 2006). When it comes to initiating a turn for people using communication boards, one prerequisite is that the orientation of the co-participant has been achieved, i.e., that s/he displays attention of the communication board (Higginbotham et al., 1988). In ordinary interaction,

postural movement and realignment of gaze are actions that may serve to encourage someone to speak. They constitute *display of reciprocity* (Heath, 1986). McIlvenny (1995) described methods to attract the attention of co-participants in interaction with deaf people using sign language. He concluded that deaf people have to do extensive work to accomplish mutual orientation in the beginning of a 'turn' and that they can only gain a right to a 'turn' if others are looking at them (McIlvenny, 1995). A parallel can be drawn to interaction with graphic means used by persons with SSPI, like the boy in the present study. Accordingly, users of graphic symbols may only gain the right to a turn if the co-participant is oriented towards the communication board.

According to Higginbotham et al. (1988), attention can be categorized into two categories; a) initial attention bids, when you attract the attention of someone to start a conversation, and b) topical initiations, occurring within conversations. In this chapter, the analysis focuses on initiation of a turn when the initiating interlocutor already has the initial attention of his co-participant, when he maintains an 'attentional frame' (Higginbotham et al., 1988). Higginbotham et al. (1988) also report methods of maintaining the attention which are employed by an adult user of a communication board and his therapist. When the user of the augmentative communication system raised his hand and shifted his gaze to the communication board simultaneously, the gaze of the therapist was led to the communication board.

In another study, Clarke and Wilkinson (2010) investigated pre-beginnings of VOCA-mediated turns following a request for information by the co-participant, a peer. They found that a visible VOCA operation activity together with 'bleep' sounds from the VOCA were systematically deployed as pre-beginnings by the participant using communication aids. The 'bleep' of the VOCA could be followed by the co-participant's turning of his gaze at the VOCA.

Buzolich and Wiemann (1988) studied two persons with SSPI using an alphabet speller and a Handivoice 120) and found that, to signal turn initiation, the persons using communication aids would shift the direction of the head towards the communication board and make a postural shift.

Since it is difficult to know what the participants' actual (cognitive) attention is directed to, the term orientation will henceforth be used. This term is used when the participants display attention through physically orienting to something. The term mutual orientation is used when the participants display attention to the same thing simultaneously.

Turn post-completion elements in ordinary interaction

As there are techniques, methods and resources for initiating a turn, there are also methods to manage the completion of a turn. ‘Intonation, pragmatic cues, syntax and non-verbal communication together project turn completion’ (Ford & Thompson, 1996:137). Furthermore, TCUs and turns are also brought to an ending by so-called *post-completion stance markers* (Schegloff, 1996). Methods to mark post-completion are often similar to methods for marking pre-beginning. Facial expressions such as smiles, posture shifts and sighs are resources that may be employed (Schegloff, 1996). Kendon (1967) and Psathas (1990) found that when the speaker arrives at a possible completion of a turn, the eye gaze is returned to the listener. This is coupled with changes in for example pitch and body posture (Schegloff, 1996). By analyzing the online use of multimodal practices, Mondada (2006) found that participants may use them to project the end of a turn. At a meeting in an architect’s office, a participant projected the end of his turn by taking the artefact, a plan, and putting it aside either at the end or before the end. In the data at hand, the communication board is an equally important artefact in the process of organizing the communicative space.

Turn post-completion elements in challenged interaction

Post-completion markers are also deployed in interaction involving persons with SSPI. In the above mentioned study by Buzolich and Wiemann (1988), the persons using communication aids used relaxation of gesticulation, grammatical completion and a shift of the head towards the communication partner as a turn yielding signal. Clarke (2005) found that head-movement was used to signal the end of VOCA mediated turns. Smith (2003) reported similar observations of a girl employing turn completion behaviors such as eye gaze towards the speaking partner, a smile, head nod and/ or vocalization, and occasionally pulling both arms back and folding them or pushing the board away. In another study, Rhys (2005) found that a woman with aphasia returned the gaze to the hearer at the same time as the target word was produced in a cuing sequence. Rhys (2005) concluded that gaze may be used as a resource for turn completion.

Data, participants, and settings

The data analyzed in the present case study consist of video recordings. It is part of a larger data set comprising video recordings of three children with SSPI in interaction with their everyday communication partners. A boy

(Magnus) was recorded interacting with a classmate at school and an assistant at home.

Magnus is 8;6 years old. He has SSPI due to cerebral palsy; dyskinetic syndrome. The physical disability affects all his limbs. He uses a wheelchair and requires assistance for mobility. He has no reported visual or hearing difficulties. The family's native tongue is Persian. The assistant at home and the staff and pupils at school speak Swedish. Magnus's language comprehension (assessed with Språkligt Impressivt Test, SIT, Hellquist, 1982, a Swedish normed test of language comprehension) at the age of 6 was found to be on an age-adequate level for Swedish. At the age of 5;6 years, his intellectual capacity was found to be at an average level (assessed with WPPSI-III, Wechsler, 2005, a test aiming at assessing the intellectual capacity). At the time of the recording, Magnus had augmented his communication with a communication board with Blissymbolics for more than five years. There are 584 bliss words on his communication board. In order to access the communication board, Magnus uses *direct selection* with a light pointer attached to his glasses. Magnus also has a computer with speech synthesis for communication. In the video recordings, he chose to communicate with his communication board. Magnus attends a mainstream school where there is a unit for children with disabilities. Most of the time he attends a mainstream class.

The interactions were shot simultaneously by three video cameras mounted on tripods. Apart from the microphones in the cameras, a digital sound recorder was also used to capture audio data (mp3 format). Each camera recorded for 3 hours in total. The setting at home was in the living room by the sofa, and at school, in a classroom. All interaction occurred without any arrangements, except for the interaction with the friend at school that was elicited in the sense that the boy was asked to choose a classmate that he would like to be video recorded with. The boy picked a friend and his teachers confirmed that the boy and the friend had good contact. The participants were told that they could talk about any topic they wished. The researcher was not present when the recordings took place. Informed consent was attained from all participants.

Spoken contributions have been transcribed in accordance with the conventions of Conversation analysis (Ochs, Schegloff & Thompson, 1996) in combination with the proposed transcription conventions in the field of AAC by von Tetzchner and Hygum Jensen (1996). For the transcription, the CLAN program (MacWhinney, 2000) has been used. In addition, time-based transcripts have been made with the multimedia annotator ELAN (<http://www>.

mpi.nl) in order to capture the simultaneous use of all relevant resources employed in the on-going action (see appendix for transcription conventions).

Some of the co-participants are native speakers of Persian. A Persian interpreter assisted in the transcription of segments in which Persian is spoken. Video clips at a duration of two minutes with different communication partners were selected and were fully transcribed. The excerpts in the present study are drawn from two different settings: at home with the boy and his personal assistant; and at school with the boy and his classmate/friend. The assistant has known the boy for 1,5 years and the friend has known the boy for 3 years. The personal assistant and the friend have received no formal training in communication.

Organizing turn pre-beginnings and post-completions

The analysis aims at demonstrating the participants' use of methods and resources for pre-beginnings and post-completions of a turn. In excerpt (1), (2) and (3), the participants' use of methods for two different pre-beginnings (section 5.1) of a turn will be presented. These excerpts illustrate pre-beginnings in turns that initiate interaction, i.e., which are not generated as a response to a prior turn. Excerpt (3) shows an initiation of a turn where the pre-beginning is a bit problematic and the boy pursues the use of the pre-beginning method. Finally, two instances will be demonstrated of how the boy makes the termination of a turn manifest by employing methods for marking post-completion (section 5.2).

Pre-beginnings in communication board-mediated turns

The subsequent excerpts aim at showing how Magnus (M) deploys different methods to claim a turn. In the first excerpt (1), Magnus catches the gaze of his friend (F) and then moves his gaze to the communication board. In doing so, he redirects the gaze of the friend.

Magnus and his friend are discussing the whereabouts of their teacher. Previously, Magnus has vocalized in a high volume and gazed at the door, and the friend has just called their teacher's name. The communication board (noted 'cbd' in the transcript) is lying on the table in front of them. Magnus selects himself as the next speaker. He has not been allocated as the next speaker, which otherwise has been found to be the first rule in the turn-taking system that participants in interaction orient to (Sacks et al., 1974).

Before turning to the excerpts, a short note on the presentation of the data is required. Interaction is produced in time. Different modalities are pro-

duced in time and in relation to each other. Many researchers acknowledge that it is not always possible to present data in a simple manner (Ochs, 1979; Ten Have, 2007; Mondada, 2006). This becomes even more evident when visual (non-spoken) data is included in the transcription. When representing data, the aim is to make the data and analysis recognizable and replicable. One purpose of representing the data and the analysis is to be faithful to the data and as transparent as possible. Another aim is to represent the data in a readable manner. In this vein, the data in the present study are presented in several ways. Time based transcripts (ELAN) have been made for all excerpts. Highlighted points in the transcripts (a→ , b→ , c→ , d→) are marked in both transcripts. (For ELAN transcripts, see appendix.) Highlighted points are represented by illustrations as well. The illustrations are frame grabs of the video recording that have been traced into drawings. Due to the richness of multimodal resources and the lack of talk, excerpt (3) is represented solely by an ELAN transcript and by illustrations.

EXCERPT 1:

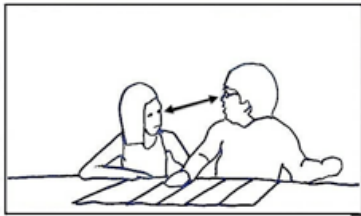


Figure 1a

01 1a→ M: ((opens mouth, gazes at F and then to the cbd))
 02 F: ((gazes at M))
 03 (4.6)
 04 F: hon e inte där
 gls: she is not there

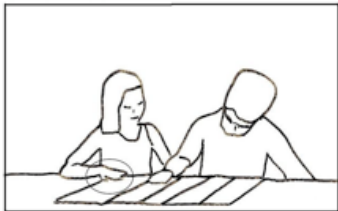


Figure 1b

05 1b→ F: ((pulls cbd toward them still picking on the
 06 wheelchair with other hand))

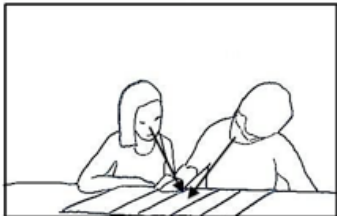


Figure 1c

07 1c→ F: ((gazes at cbd))
 08 M: DÖD
 gls: DEAD
 09 (5.1)
 10 F: död.=
 gls: dead.=

In line 01 Magnus opens his mouth, gazes at his friend and then to the communication board. The participants' gazes meet for 0.5 seconds (1a →). After a quick gaze at Magnus, the friend states that *hon e inte där* – 'she is not there' (line 04), probably as a response to the previous call for the teacher (not in the transcript). The friend responds to Magnus's mouth-opening, his gaze at her and then to the communication board, by pulling the communication board closer to them (1b→). She changes her gaze direction from looking down for 2 seconds to gazing at the communication board too (1c→). She then voices the word (DEAD) and thereby contributes to the co-construction of an CB-mediated TCU. For further analysis of the practices of turn design when using bliss communication boards, see Sigurd Pilesjö and Rasmussen (2011).

Magnus's opening of his mouth, his gaze at his friend and then to the communication board (cbd) are treated by his friend as a method of redirecting her orientation. The friend's action - pulling the communication board closer to them and after 2 seconds directing her gaze towards the communication board – ascribes a meaning to Magnus's previous gaze and an expectation for an action by him. It is not until Magnus has achieved a mutual gaze that he redirects his gaze to the communication board. This indicates that he orients to the mutual gaze as a method of redirecting the co-participant to the board. Psathas (1990) also mentions a similar function of gaze in doctor –patient interaction. The doctor uses a brief mutual gaze to 'catch' the gaze of the patient and then moves it to an object that is relevant to the action, namely the pad. In the above excerpt, Magnus gazes at his friend and then at the communication board as a marker to the friend that the communication board is a relevant communicative artefact.

In the following excerpt (2), Magnus also selects himself as the next speaker and initiates a turn. Again, Magnus manages to redirect the gaze of his co-participant, the assistant (A), but in a different way than in excerpt (1). The communication board is held up in front of them by the assistant, thereby indicating that the assistant is orienting to the communication board, displaying reciprocity.

Excerpt 2:

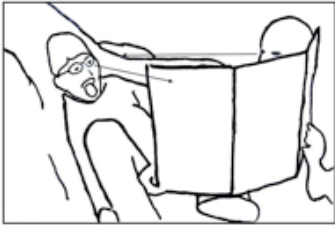


Figure 2a

01 2a→ A: ((opens mouth by the cbd))
 02 A: [he he]
 03 [((gazes at M))]
 04 M: ((smiles, sticks out tongue & gazes [at cbd up, right]))



Figure 2b

05 2b→ A: [gazes at cbd]



Figure 2c



Figure 2d

06 M: [°e::eh°]
 07 2c→ [((moves|gaze to cbd down left))]
 08 2d→ A: [((gazes at cbd left))]
 09 M: ((smiles; sticks tongue out)) ≈
 10 ≈ (X)
 11 (2.7)
 12 A: Magnus

In line 02, the assistant holds the communication board with his left hand. He opens his mouth by the communication board which might be understood as an act of pretending to eat it. By laughing, the assistant possibly indicates that the act is a joke. Then he gazes at Magnus (2a →). In line 04, Magnus smiles and thus shows recognition of the assistant's act of smiling and his act

of gazing at him. He then sticks out his tongue and continues to smile as he redirects his gaze from the assistant to the upper right side of the communication board. The assistant responds to Magnus's change of gaze direction by gazing at the upper right side of the communication board too (line 05) (2b →). In line 06, Magnus vocalizes quietly and moves his gaze direction to the upper left side of the communication board (2c →). This change of gaze direction is followed by the assistant (2d →). In line 10, Magnus points at a bliss symbol X which is followed by a voicing by the assistant who says 'Magnus'.

Through his responses, the assistant shows that he treats Magnus's gaze shift as a method for redirecting his gaze toward the communication board. This is demonstrated twice in the above excerpt (lines 04-05 and lines 07-08). Actually, gaze shift from X to Y is treated by the participants as an established, systematic and recognizable method for redirecting their orientation. Notice in line 04 that Magnus smiles, sticks out his tongue and points at the bliss symbol X without having undertaken action to establish a possible mutual orientation with the assistant. He would have done this if he had gazed at the assistant before gazing at the communication board (as in excerpt (1)). Instead, Magnus seems to follow a trajectory that is initiated by the shift of his gaze direction. Upon completion of his gaze shift, he initiates a turn by pointing at a bliss symbol on the communication board.

As mentioned above, the action of Magnus indicates that he treats the shift of his gaze as a sufficient method for steering the assistant's gaze to the communication board. The relevance of this treatment is supported by the assistant, who in line 07 acts in ways that ascribe the meaning of 'redirecting the orientation' to Magnus's gaze-navigating action.

As may be inferred from a comparison of the two excerpts presented in this section, Magnus engages in different kinds of interactional work through which he redirects the gaze direction of his co-participant: Sometimes he gazes at the co-participant before pointing at the communication board. Through this, he takes action to establish a possible mutual orientation. In other situations, redirecting the gaze of his co-participant and initiating a turn works more smoothly, as in excerpt (2). It seems to be a recurrent pattern that to achieve mutual orientation, more interactional work has to be accomplished by Magnus and his friend, than by Magnus and his assistant.

It may happen that Magnus does not manage to make his co-participant orient towards the communication board despite his use of – as shown above – systematically employed techniques for doing so. An example of this will be shown in the subsequent section. The analysis demonstrates how Magnus

treats his co-participant’s lack of redirecting her gaze as non-relevant actions. Redirecting the gaze is thus treated as the relevant understanding of gaze shift also when the method of gaze shift is not treated as such by Magnus’s co-participant.

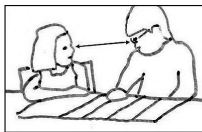
A problem with the pre-beginning – achieving mutual orientation

As mentioned in section 4.1, Magnus may have problems with redirecting the gaze and orientation of his friend. Excerpt (3) below illustrates this. The analysis aims at showing how Magnus, by repeating and thus pursuing the action (redirecting the orientation of his co-participant) achieves mutual orientation. Finally, the co-participant orients towards the methods that the boy is using.

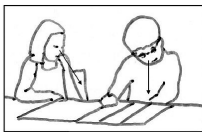
Excerpt (3), below, demonstrates how Magnus, through the pursued use of the same techniques as in excerpt (1), enhanced with other resources such as arm movements and vocalizations, finally manages to redirect the orientation of his friend. Thus, he employs the same method as in excerpt (1) although he uses it four times in order to achieve the expected response, the voicing in line 17 (the second part in the collaborately constructed [symbol pointing+voicing] element (see Sigurd Pilesjö & Rasmussen, 2011).

As mentioned above, excerpt (3) is represented by illustrations and an ELAN transcript. The notations in seconds refer to the time in the ELAN transcript. The excerpt begins at 00:00 seconds.

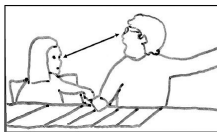
EXCERPT 3:



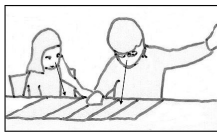
Mutual gaze (3a1 ↓)



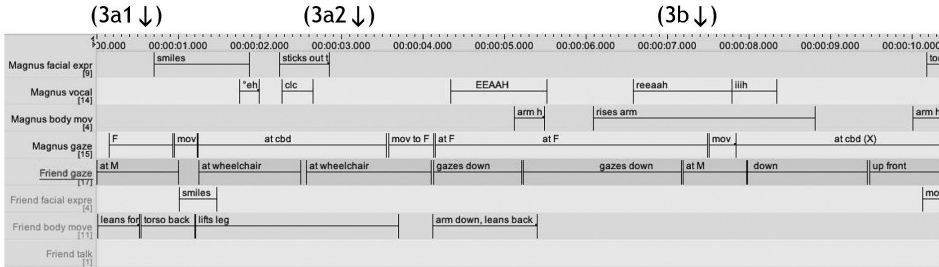
M gazes at cbd
F at wheelchair (3a2 ↓)



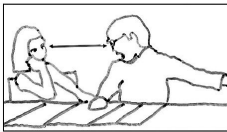
M vocalizes.
Mutual gaze (3b ↓)



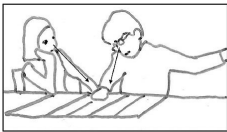
M gazes at cbd
F looks down



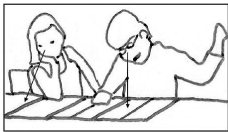
From 00:00 s, there is a mutual gaze between Magnus and his friend (F). At 01:00 – 03:00 s (3a1-2 →), Magnus smiles, sticks out his tongue, vocalizes quietly and gazes at the communication board. During these activities, the friend looks at the wheelchair. At 04:00 s, Magnus gazes at his friend again, vocalizes, and this time hits the table with his arm. At 07:00 s (3b →), after a second mutual gaze between Magnus and his friend, Magnus moves his gaze to the communication board and points at a bliss symbol. In excerpt (1) the mutual gaze followed by Magnus’s move of his gaze at the communication board was treated as a method to achieve the orientation from the co-participant. In this instance however, his friend instead looks down and up in front of her. This is once again treated as a problem by Magnus, who hits the table with his arm and sticks his tongue out. At 07:00 s, as stated above, mutual gaze is achieved between Magnus and his friend for a second time. At 08:00 s then, the friend looks down, looks up and behind her.



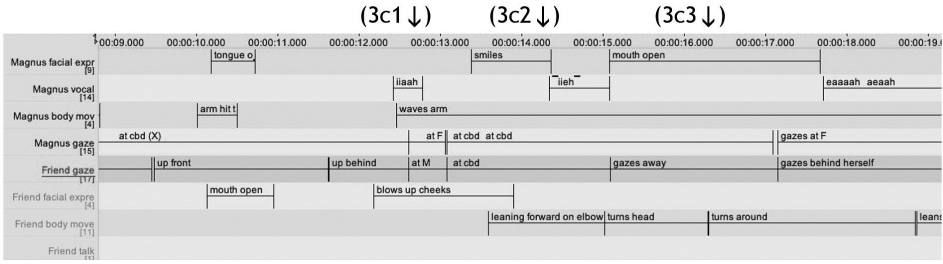
Mutual gaze (3c1 ↓)



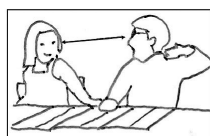
M gazes at cbd,
F quickly at cbd (3c2 ↓)



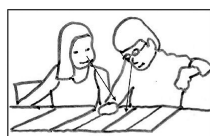
M gazes at cbd, F looks away.
M waves arm and vocalizes (3c3 ↓)



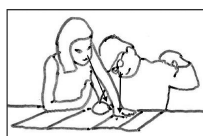
At 12:70 – 16:30 s (3c1-3 →), the participants achieve a mutual gaze for the third time after which Magnus – also for the third time - gazes at the communication board. At this point, the friend quickly gazes at the communication board, but then she turns her eyes away. Magnus smiles, waves his arm and vocalizes at the same time. Now, at 18:00 s, Magnus vocalizes and gazes at his friend. She, however, looks behind her.



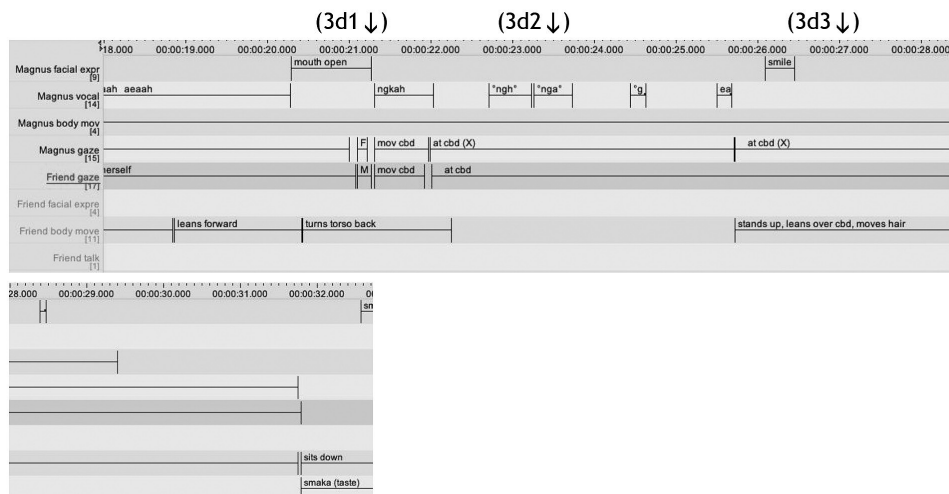
Mutual gaze (3d1 ↓)



M vocalizes and gazes at cbd (3d2 ↓)



F stands up and orients to cbd (3d3 ↓)



At 21:00 – 27:00 s, after the last vocalization, there is, once again, a mutual gaze (3d1-3 →). At this point, after 26 seconds and three repetitions (or three 'restarts' of what in other interactions has been treated as a technique for 'redirection of the orientation', Goodwin, 1981), his friend responds by standing up. She then turns to the communication board and voices *smaka* ('taste'), the word that Magnus is pointing at. Thereby, the friend finally treats Magnus's actions as indicating redirection of her orientation, as she does a corresponding action of orienting to the communication board herself.

Through the repeated use of methods for the 'redirection of orientation' such as gaze at the friend and then at the communication board, vocalizations, smiles, tongue movements and arm 'hittings', Magnus finally manages to redirect the orientation of his friend. The fact that Magnus pursues the use of the methods suggests that he orients to this method as relevant and expects a specific response – the voicing. Magnus does not stop repeating the method until he gets the expected response.

It also seems clear that the method of 'catching the gaze' of the speaking co-participant is a general technique for achieving the redirection of the co-participant's orientation. It is used in excerpt (1) and (3). In this instance however (excerpt 3), the task demands a bit more interactional work than in

the interaction with the assistant. The method is, apart from being repeated, also accompanied by arm movements (Magnus hits the table with his arm) and vocalizations. In this excerpt it takes a large amount of interactional work and quite some time to achieve common orientation.

In sum, the participants use specific methods to achieve mutual orientation in the turn transition space before initiating a turn, and these methods are used as a pre-beginning. The methods comprise the use of mouth-opening and tongue movement by the participant with SSPI, and the use of gaze direction at the co-participant and then to the communication board (excerpt 1), which can also be a smile and gaze at the communication board directly (excerpt 2). The methods seem to be used systematically and recurrently and are thus recognizable methods to the participants. The boy pursues the action by repeating the method and also uses vocalizations and arm movements to redirect the attention of his friend in excerpt (3). And finally, to solve the communicative task of establishing a mutual orientation toward the communication board might entail more or less work for the participants, as has been shown above.

Post-completions in communication board-mediated turns

As the CB-mediated turn may be prefaced by a pre-beginning such as the methods we have seen above, so may it be followed by a post-completion. In and through the use of these methods, the action is framed as a turn unit. Through post-completion methods, the participants treat the main unit as closed and thus as a complete turn unit. These post-completion methods may be similar to the post-completion stance marker mentioned by Schegloff (1996). The excerpts below aim at showing the resources that Magnus may use to give the conversational floor away after the completion of the mutually built segment of the turn that his turn consists of.

The excerpt (4) below is a continuation of excerpt (2). Magnus and the assistant (A) are talking about what food they like and Magnus has just stated *Jag älskar pasta* – 'I love pasta' by pointing at the bliss symbols JAG ÄLSKA PASTA (*I, (TO) LOVE, PASTA*). The excerpt begins with the assistant who is voicing the last word 'pasta'.

EXCERPT 4:



Figure 4a

18 A: pasta?=
19 =((gazes at M))



Figure 4b

20 M: [((smiles and gazes at A))]
21 (1.0)
22 A: [°är det det som du gillar°]
gls: ° is it that that you like°
23 [((gazes at cbd))]

In line 18, the assistant voices the last word, ‘pasta’, in the construction ‘I love pasta’. He gazes immediately at Magnus. As a response to this, in line 20, Magnus smiles and gazes back at the assistant. The assistant responds to this by acknowledging his understanding formulated as a (responsive) question *är det det som du gillar* – ‘is it that that you like’ (‘is that what you like’). The assistant apparently treats the gaze and smile at him as a method for post-completion and takes a turn of his own immediately following the post-completion. He treats the gaze from Magnus as a method of post-completion at a point where there is a projected possible completion of the CB-mediated turn, after the syntactic unit, ‘I love pasta’.

Also in the next excerpt (5), Magnus employs gaze direction and smiling as resources for doing a post-completion. Magnus and the assistant (A) are still talking about what they like to eat. Magnus points at the bliss symbol for ‘candy’.

EXCERPT 5:

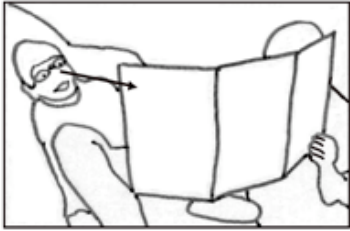


Figure 5a

01 M: [GODIS]
 gls: CANDY
 02 (5.6)
 03 A: godis [(.) vilket godis jag gillar]
 gls: candy (.) which candy I like
 04 | ((gazes at M)) |



Figure 5b

05 a→ M: | ((gazes & smiles at A)) |
 06 (1.4)
 07 A: [jag gillar inte godis]
 gls: | don't like candy
 08 | ((gazes at M)) |

In line 03, the assistant voices the word *godis* 'candy'. Following a micro-pause he expands the voicing to a question to himself from Magnus, *vilket godis jag gillar* ('which candy I like') and then gazes at Magnus. By this expansion the assistant infers from the word 'candy', in the interpretative framework of 'questioning about what you like to eat', that Magnus requests information about what candy he likes. The assistant gazes at Magnus and Magnus gazes back at the assistant, thereby achieving a mutual gaze. After completing the question which he has voiced himself (line 03), the assistant now responds to the question by stating *jag gillar inte godis* ('I don't like candy').

By taking a turn of his own in line 07, the assistant treats the gaze in line 05 (a→) as a method of turn completion by Magnus and as a point relevant for turn transition, a *TRP*, (Sacks et al., 1974). Thus, Magnus's gaze at the assistant signals to him that Magnus accepts the understanding produced by the assistant. The understanding that is produced ('which candy I like') by the assistant is a grammatically complete phrase in Swedish and therefore also

projects a possible completion of the CB-mediated turn. In addition, Magnus's gaze signals that there is no more to come, thereby indicating that the whole turn is complete. The assistant also responds to the turn as complete, thus they seem to agree on this method.

Post-completion methods, as demonstrated above, are oriented to by the participants as mutually accepted ways of achieving turn completion and speaker change. These findings seem to coincide partly with the findings in a study by Buzolich and Wiemann (1988) where they found that speaker state signals were illustrated by a shift of head direction towards the communication board and a postural shift by the person who used AAC modes.

In excerpts (4) and (5), above, Magnus completes his turn by gazing and smiling at the co-participant. The use of gaze direction and smiles seems to be systematic and recurrent and is recognized by the participants as methods for post-completion. Through the resources and methods demonstrated here, the participants are able to manage the completion of a turn. The completion is systematically followed by a speaker shift.

Discussion

The focus of this study is how participants manage turn transition in aided AAC, specifically on the use of pre-beginning and post-completion methods. The findings suggest that both the 'speaker' and the 'listener' systematically deploy and orient to specific bodily action and vocalizations as resources and methods in the 'transition space' (Schegloff, 1996; Clarke & Wilkinson, 2010).

To gain a right to initiate an aided turn, the boy works interactionally to get the attention of the speaking partner, i.e., to get the speaking partner to orient to the communication board. Excerpts (1) and (3) show that, in order to take a turn, Magnus has to make the co-participant orient to the communication board. This seems to be one of the impacts that the construction of actions has in the present data. It is a central feature of actions in bliss aided communication that the speaking co-participant voices the action of the participant with SSPI (Sigurd Pilesjö & Rasmussen, 2011). The participant with SSPI thus needs to draw the attention of his co-participant to the bliss indications that are to be voiced. Pre-beginnings seem to be a method used for such a task. The absence of pre-beginnings would probably require some compensating practice in order to make the turn-taking work smoothly, perhaps a constant orientation to the communication board by the speaking communication partner. Hence, the analyses of the data at hand support the findings

of Higginbotham et al. (1988) in their study of interaction between an adult who uses AAC modes and a speech therapist, and the findings of Clarke and Wilkinson (2010) in their study of interaction between children using VOCAs and their peers. In addition, the findings seem to coincide partly with a study by Buzolich and Wiemann (1988) where they found that speaker state signals were demonstrated by a shift of head direction towards the communication board and a postural shift by the person who used AAC modes.

Furthermore, in one instance (excerpt 2) the assistant follows the gaze of the boy without the boy having made sure that he had the attention of the assistant. In contrast, in excerpt (1), the boy does not change the direction of his gaze to the communication board until after a mutual gaze with his friend. This difference in attunement to the actions of Magnus, which has been shown to be systematic, recurrent and recognizable, could be explained by a difference in placement of the communication board. In excerpt (2), with the boy and the assistant, the communication board is held vertically in front of the participants by the assistant. By holding the communication board vertically, the assistant is displaying an orientation to the communication board prior to action and talk, prior to any CB-mediated turn. In the setting with the friend, where the communication board lies on the table, the friend is not displaying an orientation to the same extent as the assistant. However, such an explanation is not supported in the data at hand. The analysis has shown that the conversational partners' orientation to the communication board is not sufficient for the boy to take a turn in these data. A mutual active orientation is acquired by the participants and this involves interactional work, independently of the initial position of the communication board.

Apart from pre-beginning methods, this study also investigates post-completion methods. These methods, displayed in excerpts (4) and (5), may be crucial to the fact that they can add projectional features to the CB-mediated TCU. A post-completion may, as shown in the analyses above, provide a cue to the possible completion of a turn. Vice versa, if post-completions are not used, the communication partner misses one cue in projecting when the turn is completed. In that sense the post-completions may be compared to completions. Hence, Magnus's gaze at the co-participant when he completes the turn, might be compared to a pitch drop in a spoken turn in ordinary interaction in the sense that it can project turn completion. The use of post-completion methods, as shown in this chapter, is probably similar to those used in ordinary interaction. However, they seem to be of greater importance. The practice of gaze may be regarded as a solution to an interactional problem

(Rhys, 2005), the problem of projecting when the turn is complete, in order to secure a smooth turn transition and organize participation. The project of achieving turn completion in the data at hand does not seem to be organized in the same sequentially detailed way as in ordinary spoken interaction. Hence, completions and post-completions within the turn completion area tend to merge into one action.

The deployment of methods for pre-beginnings and post-completions show a speaker awareness of the co-participants, a recipient design. By using gaze to catch the other's gaze (as in excerpt 1), gaze to direct the other's gaze (as in excerpt 2), and gaze to display that the turn is complete (excerpts 4 and 5), the boy with SSPI displays an awareness of what is needed to manage the turn-taking. The use of these methods and practices are crucial for turn transition and the organization of communicative space.

Previous research has found that persons with SSPI initiate turns less than their interlocutors (Harris, 1982; von Tetzchner & Martinsen, 1996). Clarke and Wilkinson (2008) found that the speaking partner orients to the local sequential position of VOCA-mediated turns (first or second position within a minimal sequence) and suggest that this orientation may restrain an effective use of initiating (first position) VOCA-mediated turns. The present analysis suggests another possible reason why turn initiations are less frequent. The data in this chapter demonstrate that methods for organizing pre-beginnings, used for redirecting the orientation of the co-participant may involve extensive interactional work (such as multiple restarts) by the participants with SSPI to the extent that sometimes they might not think it is worth trying. One should bear in mind that a participant with these impairments has a motor disability, and that the smallest movement can be highly demanding. It is also possible that s/he does not initiate turns less at all, but that many turn initiations may go unnoticed by the speaking co-participants.

It is also important to keep in mind that in the present study the participant with SSPI is a child, interacting with another child. There is a lack of studies of children in aided interaction in naturally occurring settings, except for a few studies (e.g., Clarke, 2005; Clarke & Wilkinson, 2007, 2008, 2009; Ferm, 2006). The interaction may, of course, differ between child dyads, adult dyads, and child-adult dyads. Due to the general lack of studies on children's aided interaction, the findings in this chapter are mainly discussed in comparison with non-aided adult interaction. This may be a weakness of the present study. However, it could be that there is no difference between adult and child interaction in this regard since the focus is on fundamental

interactional phenomena, and they typically tend to develop early in life (Bullock, 1979; Strömqvist, 1984).

Furthermore, the findings also seem to question the idea that a major part of the body movements of the person with SSPI are non-volitional (Kraat, 1985). In these data, many body movements are found not to occur by hazard, but in interactionally relevant places. The gaze direction, smiles, vocalizations, tongue movements, and other body movements seem to be crucial in managing the turn-taking. The findings suggest that everyday communication partners and professionals should be cautious when dismissing body movements as non-volitional. When doing a detailed sequential analysis, as in this chapter, it may turn out that the body movements are more interactionally relevant than first assumed.

Additionally, earlier research and clinical experience suggest that communication aids are not so frequently used (Harris, 1982; Light et al., 1985c). This means that most interaction involving persons with SSPI may be achieved by methods using only bodily action and vocalizations as resources. Consequently, the bodily action and vocalizations must in those cases be employed as turn units. However, in the present data the bodily action and vocalizations are used as methods to manage the turn. This means that, sometimes bodily action and vocalizations are used as methods *to manage* the aid-mediated turn and sometimes bodily action and vocalizations are used as methods *to construct the content* of the turn. The change between these different uses of bodily action and vocalizations (when the communication board is used and when it is not used) demands an awareness and flexibility of all participants.

As demonstrated in the present data, gaze direction is a resource that plays a significant role in turn transition. In ordinary talk between adults, gaze is a resource that can be used separately from the spoken language. In that sense, gaze can do other work, often complementary (Streeck & Hartge, 1992), at the same time as the speaker uses a spoken lexico-syntactic channel (speech). This is however not the case for Magnus in the present study. A visible co-orientation (Goodwin, 2000) can probably not be achieved in an ordinary manner. The boy's gaze is locked to his lexico-syntactic channel due to the fact that he indicates his words (bliss symbols, i.e., his lexico-syntactic channel) with his light pointer attached to his glasses. The fact that the boy points at his communication board with the light pointer should influence the possibilities to initiate and complete a turn compared to, for instance, the possibilities for a person using finger-pointing to indicate a graphic symbol. The gaze of the person in the latter case is not occupied with pointing. Future studies

will have to look into if turn initiation and turn completion are organized differently when the person is pointing with a body part that is not locked to the gaze.

In addition, one may pose the question whether the ability to use pre-beginnings and post-completions may be a prognostic factor for how well a communication board may function for a specific person. It is possible that the more pre-beginnings and post-completions are used, the greater the efficiency of the communication board in everyday interaction.

The excerpts in the present chapter are chosen from interaction with one boy. We have observed, however, that methods for pre-beginnings and post-completions seem to be employed in interactions with another boy in the data set, although not with the same resources. In future research, it is recommended to study other persons using AAC modes, to explore if they also deploy methods for pre-beginnings and post-completions and what resources they employ to accomplish them.

Finally, in the present data the speaking co-participant orients to the actions of the participant with SSPI as meaningful even though in one instance it took more interactional work. The speaking co-participant displays sensitivity to bodily action, such as gaze direction, facial expressions, other body movements and vocalizations by the boy. This was also concluded in a study of pre-beginning methods in VOCA use by Clarke (2005); and Clarke and Wilkinson (2009).

Conclusions

The turn-taking in the data at hand is organized in a way that may be specific to this kind of interaction. The turns are commonly constructed in a pattern of a pre-beginning (achieving mutual orientation) followed by an CB-mediated TCU (see Sigurd Pilesjö & Rasmussen, 2011). This unit is commonly completed with a post-completion gaze. This seems to be an orderly, recurrent and systematic feature of this kind of interaction. Additionally, the findings provide support for the argument (Goodwin, 1981) that speech, linguistic expression such as pointing out bliss symbols and other resources like gaze and body movements, are very much integrated in the total communicative process.

Bodily action and vocalizations are employed together with the pointing at a bliss symbol, in a seen but unnoticed manner. These methods are employed in turn transition, for the person with SSPI to claim the turn and to yield the turn. The task of these methods is to make the turn transition work.

The bodily action and vocalizations may thus be seen as ‘the servant’ (Heath, 1986) of the turn constructional unit (i.e., the CB-mediated TCU).

Furthermore, the findings show that, different resources and practices are deployed to accomplish the pre-beginning and post-completions. The boy may initiate a turn by gazing first at the speaking communication partner and then at the communication board, thereby ‘catching’ the speaking communication partner’s gaze before pointing at the communication board. Sometimes he initiates a turn by redirecting his attention straight to the communication board without having to look at the communication partner first, thus demonstrating a kind of assumed robustness in the use of this method of redirecting the orientation. Apart from gaze direction, other resources that may be employed in pre-beginnings are smiles, tongue movements, vocalizations and arm movements.

As a post-completion, the boy may employ gaze direction and smiles at the co-participant. The post-completion functions in similar ways as completion methods. Furthermore, the data at hand suggest that the communication board is oriented to not only by the person with the impairment but also the co-participant, indicating that it is a shared communication aid.

Finally, this study has shown that a detailed sequential analysis may contribute information on how the participants together deploy and orient to bodily action and vocalizations in turn transition. By employing an approach that takes into account the simultaneous use of multiple resources by the participants (Goodwin, Goodwin & Olsher, 2002; Streeck, 2003), the analysis reveals that these resources are deployed orderly, recurrently and recognizably.

Clinical implications

Turn-taking is fundamental in interaction and therefore essential in intervention as well. This analysis suggests that when assessing children with SSPI and their ability to contribute to turn-taking, it may be useful for the professional to look for the use of pre-beginning and post-completion resources and methods. Intervention can aim at increasing the use of pre-beginning and post-completion methods by the participant with SSPI by actual training in the methods. That includes raising the awareness of what resources and methods that are used to manage turns by both participants. This could increase the possibilities for children with SSPI to establish communicative space and participate in interaction. It is also possible that it might increase the confidence of new communication partners (Bloch, 2010) and their willingness to

interact. Additionally, intervention may aim at raising the awareness of what strategies the person with SSPI uses when s/he tries to take a turn even if s/he is not responded to at first. Furthermore, awareness of the location of the communication board may add to the efficiency of aided AAC.

There seems to be a need for pre-beginning methods and post-completion methods in aided interaction, and this fact should be taken into account when manufacturers construct new communication aids or when existing ones are modified. In addition, what is required by a user of a communication aid is important for professionals to know when they recommend a specific AAC mode or communication aid for a person with SSPI.

In addition, for professionals and everyday communication partners it is useful to know that what at first glance seems to be a 'non-voluntary movement' sometimes is voluntary, and that these movements can be of great importance for the management of the turn-taking.

Finally, the process of AAC may be described as a complex woven tissue of subtle and multiple resources and methods, accomplished in close collaboration by the participants. Aided interaction is so much more than one individual's use of a communication aid. A sensitivity to and an awareness of the ways participants organize their communicative space would probably increase the possibilities to make AAC intervention work.

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APPENDIX

Transcription conventions

Two types of transcripts are used in this study. They are produced with different software, CLAN and ELAN, which are shortly introduced below.

1. The CLAN transcriptions presented in this paper as excerpts (1-5) combine the CA transcription used by Ochs, Schegloff and Thompson (1996) in combination with the transcription conventions in the field of AAC used by von Tetzchner and Hygum Jensen (1996). This is a vertically organized transcript, also combined with drawings of relevant body actions.
2. The ELAN transcriptions are more detailed and are used for specific parts of the whole excerpts. This is a horizontally organized transcript, enabling exact timing of the relevant contributions. Letters and arrows (for example a↓) indicate where the ELAN transcript matches the CLAN transcript. In one instance, in the ELAN transcripts, there is not enough room to write all the spoken words on the selected section of the tier. This is in excerpt (1), where the girl says ‘hon e inte där’ (line 04). In the matching ELAN transcript in the appendix, only the words ‘hon e’ could fit in the section. The CLAN transcript captures all the spoken words and is the one that should be oriented to when reading the analysis.

The conventions for representing phenomena in the data differs between CLAN and ELAN transcripts, and is therefore presented separately as follows.

Conventions for CLAN transcripts

- | | |
|------------|---|
| dog | ordinary writing indicates naturally spoken elements, vocalizations and laughter. |
| CAT | capital letters indicate talk delivered at a louder volume than the surrounding talk. |
| <u>cat</u> | underlining indicates emphasis. |
| . | a full stop indicates a falling, or final intonation contour. |

- °cat° degree signs indicate a passage of talk or a vocalization which is quieter than surrounding talk.
- eeah— indicate a vocalization or spoken element delivered in higher pitch than the surrounding talk.
- >cat< The combination of “more than” and “less than” symbols indicates that the talk between them is compressed or rushed.
- (.) a full stop or number in single brackets indicate an interval in the stream of the previous talk above in the transcript. A dot indicates an interval of one tenth of a second or less. A number in single brackets indicates the length in seconds and tenths of a second of the interval.
- ≈ a ‘wavy’ equal sign marks where there is no interval between adjacent actions.
- [a left hand bracket links ongoing action with overlapping action at the point where the simultaneous action begins.
-] a right hand bracket links ongoing action with overlapping action where the simultaneous action stops.
- cbd represents a communication board.
- SMAKA* capital letters in italics indicate pointing at the bliss symbol for SMAKA (taste) on the communication board.
- (*TASTE*) single brackets mark where target item(s) is/are in doubt.
- ((nods)) double brackets indicate a description of visible bodily action that can be interactionally relevant.
- gls: represents a glossing, translation into English.

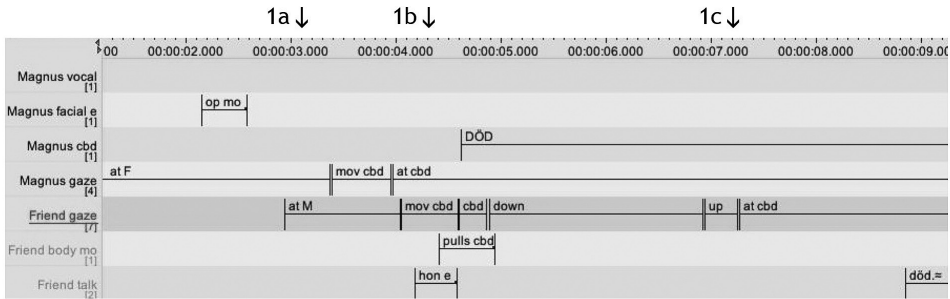
For some indications of bliss words it has been difficult to see clearly what word is pointed out. As seen in the list above, these indications have been put within brackets in the CLAN transcripts. In order to decide for the correct word, the speaking partner’s voicing of the word is used: (i) when this word is accepted by the person that uses bliss, and (ii) when it is apparent that this word is located within the local area of the pointing on the board.

Conventions for ELAN transcripts

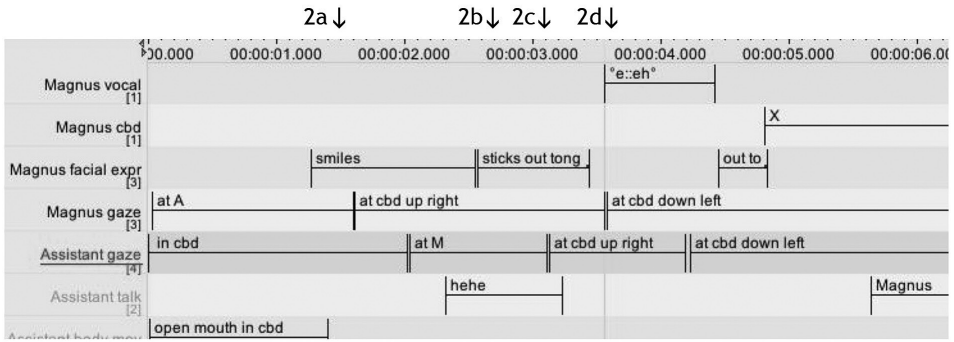
F	friend
M	Magnus
A	assistant
cbd	communication board
in cbd	the assistant has the communication board in his mouth and consequently his eyes and gaze is 'in' the communication board, very close to the communication board but too close to be called looking.
F gaze	at M= the friend gazes at Magnus
mov cbd	moving gaze to the communication board
to cbd	moves gaze to the communication board
moves g to cbd	moves gaze to the communication board
M gaze at F	= Magnus gazes at friend, at cbd= gazes at the communication board
A gaze at M	= the assistant gazes at Magnus
F talk	friend's talk
hon e	hon e inte dār= she is not there
A talk	assistant's talk
M vocal	Magnus's vocalization, for example EEAAH
EEAAH	vocalization in high intensity
°eeaah°	vocalization in low volume
<u>eeaah</u>	vocalization with emphasis
M body movement	Magnus's movements of head, arm/hand and other movements
arm h, arm hit t	arm hits the table

F body movement	friend's movements of head, arm/hand and other movements
leans for	leans forward
A body movement	the assistant's movements of head, arm/hand and other movements
M facial expression	Magnus's facial expression for example smile
sticks out t	sticks out tongue
sticks out tong	sticks out tongue
out to	sticks out tongue
F facial expression	friend's facial expressions
op mo	open mouth
open mouth in cbd	the assistant opens his mouth by the communication board (pretends to eat the communication board?)
M cbd	X, Magnus points at the bliss symbol X on the communication board, (pasta) = Magnus is presumed to point at the bliss symbol for 'pasta'.

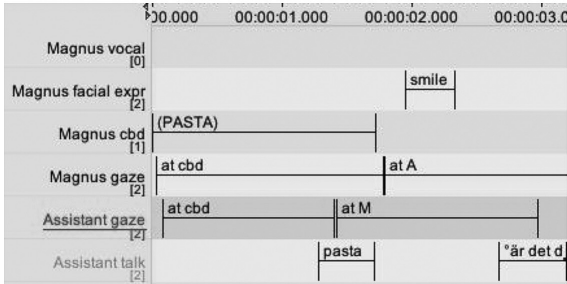
EXCERPT 1



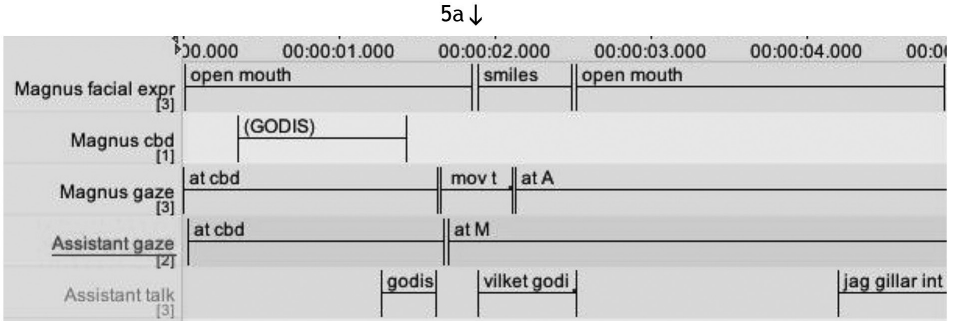
EXCERPT 2



EXCERPT 4



EXCERPT 5



PAPER III

Creating meaning through the coordination of gaze direction and arm/hand movement

MAJA SIGURD PILESJÖ

Abstract

This study is an investigation of the practice of achieving shared understanding in Augmented and Alternative Communication (AAC) using natural modes. The interaction between a girl with severe speech and physical impairment (SSPI) and moderate intellectual disability and her everyday communication partners is explored. The aims are to investigate how the participants create meaning through the girl's coordination of gaze direction and arm/hand movements and vocalisations, as they occur in natural interaction with everyday communication partners. The principles of conversation analysis (CA) were used to record, transcribe and analyse the interaction. The analysis demonstrates that the participants collaboratively create local meaning in and through the coordination of gaze and arm/hand movement. Thus, the speaking co-participants ascribe meaning to the girl's actions of directing gaze and arm/hand movement at the same target. The analysis shows that the ascription of a specific meaning is context-specific. These findings highlight the importance of taking into account all interaction-relevant modalities and the relevance of systematic details in the micro-context of interaction when looking for processes of sense-making. In addition, the role of the communication partner is emphasised. These findings may have implications for clinical intervention.

Keywords: *severe speech and physical impairment, intellectual disability, interaction, gaze direction and arm/hand movement, ascribed intention*

1 Introduction

The overarching aim of this study is to investigate communication between a girl with severe speech and physical impairment (SSPI) and an intellectual disability and her everyday communication partners in everyday settings. It explores how the communication partners treat the girl's coordination of gaze and arm/hand movement as a method of creating meaning. The girl has cerebral palsy. She is unable to speak. Previous researchers have stated that, when a person cannot speak, an inevitable consequence is that other resources play a more important role (Kraat, 1985; Collins and Marková, 1995; von Tetzchner, Grove, Loncke, Barnett, Woll and Clibbens, 1996; Olsson, 2004; Streeck, 2009). In addition, a motor disability prevents the usual production of gestures and other movements (Tucker & Kretschmer, 1999, Clarke, 2004). Usually, gestures are produced to accompany speech (Streeck, 2009); however this is not the case in the present study.

The study scrutinises the following issues: How do the participants achieve meaning? What actions do they accomplish? What does it look like when the participants ascribe meaning to the actions? The coordination of gaze direction and arm/hand movement will be shown to be a method that the participants employ to achieve shared understanding. I will demonstrate and discuss how the participants (with and without impairment) create meaning of the action accomplished by the coordination described in specific contexts.

The present study is carried out taking a dialogical/interactionist perspective. From this approach, the interaction is seen as being collaboratively achieved by the participants. Hence, communication partners are considered to create meaning together. Meaning is created *between* people and emerges dynamically over time and is therefore never fixed in advance.

The principles and practices of conversation analysis (CA) (Heritage, 1984; Hutchby & Wooffitt, 2008) are applied to record, transcribe and analyse the data. In CA the aim is to explore how the participants' actions influence the process of communication as manifested within the sequential context of the ongoing interaction. CA is a qualitative, inductive approach; thus it does not use predefined analytic categories. Instead, CA examines how the participants themselves define and create meaning in natural settings. By a detailed sequential analysis, conversation analysts aim to gain insight into how participants' actions are organised, arranged and systematised in interaction. The analysis is made from a detailed transcription of recordings of naturally occurring interaction and results in a description of methods and practices, showing the recurrent, orderly and thus sense-making patterns in the interaction (Hutchby & Wooffitt, 2008).

There are several reasons for using CA to study these materials. One reason is that CA does not consider communication disorders as being the problem of one participant only but as a problem to which all participants relate. In challenged interaction the ecology of the interaction is regarded as changed (Goodwin, 2002). Further, the qualitative analyses conducted in CA describe the competences of the participants. The validity in CA studies is considered to be high since interaction is studied in natural settings and the findings are often easy to adapt to intervention recommendations. In addition, sequential analysis is recommended in order to gather knowledge on the relative effectiveness of different resources and methods in accomplishing meaning (Hostyn, Neerinx, Maes, 2011).

Although the dialogical perspective seems highly motivated when we explore interaction with people with severe impairments, studies reporting on dialogue are rare (Hostyn, Daelman, Janssen, Maes, 2010). However, the last decade has shown a growth in disability research using Ethnomethodology and CA (Robillard, 1999; Rasmussen, 2010), the latter being applied to communication disorders to an increasing degree (e.g. Brouwer, Day, Ferm, Hougaard, Rasmussen, Thunberg, 2011; Higginbotham, 2009; Bloch & Beeke, 2008; Perkins, 2007; Clarke, 2004; Goodwin, 2000a, Laakso & Klippi, 1999; Collins, 1996).

This study focuses on arm/hand movement and gaze as resources that are employed by the girl with SSPI and intellectual disability in sense-making. Although several researchers have been investigating multiple resources for a long time (e.g. Heath, 1986; Streeck, 2003; Mondada, 2006; Goodwin, 1986, 2002; Rasmussen, 2010), until now conversation analysts have mainly focused on talk, and the field of gesture studies in ordinary interaction is rather new (Streeck, 2009).

In order to shed light on the phenomena that are the focus of the present article, we will now briefly look at previous research in some closely related areas.

1.1 Gesture and gaze in ordinary interaction

Studies on gesture have been undertaken by several researchers (e.g. Kendon, 2004; Goodwin, 1981; Streeck & Hartge, 1992). From an interactional perspective, gestures are a form of human practice and can be defined as communicative action of the hands (Streeck, 2009). Some researchers also include other body parts in the definition of gesture (Kendon, 2004). In the present study the term bodily action is used when referring to communicative ac-

tion by the hands, gestures, and other communicative body movement. The term gesture is used when referring to previous studies. In ordinary spoken interaction, gestures are elusive phenomena and normally operate quietly in the background (Streeck, 2009). Gestures can have many functions. Streeck (2009) divides the meaning-making and understanding of gestures into the following six different ecologies (Streeck, 2009:8-11): a) making sense of the world at hand; b) disclosing the world within sight; c) depiction; d) thinking by hand; e) displaying communicative action, and f) ordering and mediating transactions. For example, there are gestures that aid the co-participants in achieving a shared orientation, so-called gestures of orientation (Goodwin, 1986; Streeck, 2009). The study will also address gaze. In addition to gestures, gaze has many functions in talk-in-interaction (Kendon, 1967; Goodwin, 1981; Streeck, 2009). The gaze, or lack of gaze, at the listener or speaker are important resources related to turn beginning or turn completion. Gaze can also point out an area or object which is relevant to the ongoing interaction (Streeck, 1993). Gesture and gaze are also employed together. For example, pointing gestures that select a target out of the surroundings often require a visual orientation towards the target (Streeck, 2009).

1.2 Previous research on individuals with severe speech and physical impairment and intellectual disability

In previous studies of people using Augmentative and Alternative Communication (AAC) systems, researchers have stated that these individuals form a heterogeneous group in terms of etiologies, impairments, severity of impairments and AAC modalities used (Pennington, Marshall, Goldbart, 2007; Granlund & Olsson, 1999). Research has shown that the interaction is asymmetric, in the sense that the speaking communication partner often dominates the interaction by, for example, asking many questions and taking many turns (Light, Collier and Parnes, 1985a, Björck-Åkesson, 1992). Iacono et al. (1998) found that expressions of communication in individuals with severe and multiple disabilities are highly non-conventional and individual (Iacono et al., 1998). In addition, children with severe cognitive and physical disabilities often have a restricted repertoire of movements and vocalisations to use in communication (Tucker & Kretschmer, 1999).

In the present study, actions that are accomplished when employing the coordination of gaze direction and arm/hand movement will be investigated. In the aforementioned study, Iacono et al. (1998) investigated functions and modalities of communication in a group of students with severe and multiple

disabilities. They found that the most common modalities were vocalisations, gestures, eye gaze and smiles, among others (Iacono et al., 1998). The most frequent functions were requests for an object/action and comments. Vocalisations and smiles were found to dominate as comments. Gestures and gaze were often employed to make requests. Gestures were also predominantly used as requests and were sometimes accompanied by smiles (Iacono et al., 1998). Grove, Bunning, Porter & Olsson (1999) state that the level of inference and interpretation is high in interactions with people with severe intellectual disability.

It can be questioned if the arm/hand movements in these materials are produced as communicative action or if they are solely nonvolitional movement. What is, however, clear, is that the arm/hand movements which the girl produces in our study, in coordination with gaze direction, are treated by the participants as being understandable in specific ways. Hence, as will be demonstrated, they form contributions to the ongoing interaction.

1.2.1 The concept of 'intention'

In order to interact, we have to ascribe meaning to the behaviour of everybody, including individuals with severe impairments. Parents and other everyday communication partners make sense of their child's behaviour but may not be aware of how they do this (Grove et al., 1999). In the materials which are investigated in this paper, as well as in all interaction, it is difficult to know the true 'intention', in the cognitive/intrapersonal sense of the word. However, the ascribed intention can be observed, analysed and discussed.

Researchers in the field of severe speech, physical and cognitive impairment show a deep interest in the concept of intent (Iacono et al.1998; Grove et al., 1999). The present study is an investigation, from an interactionist perspective, of how the actions of a person with SSPI and intellectual disability are treated. This perspective is rare in studies of disability. In theory, there are two main approaches to intentionality. On the one hand, intention is looked upon as a set of personal behaviours or skills on an intrapersonal level (the speaker or the listener). On the other, intention is considered to refer to a co-created outcome of interpersonal interaction (Olsson, 2004). Although the term 'intention' is commonly used, the meaning of the notion is widely debated (for an analysis of the discussion, see Stamp & Knapp, 1999). Several studies in the vein of intrapersonal skills have defined intentional communication in different ways (Iacono et al., 1998; Grove et al., 1999; Snell, 2002; Bruce & Vargas, 2007). These definitions frequently include coordinated at-

tention as a variable. In addition, there are several other behavioural factors that are typically considered as criteria. These are: persistence until the goal is reached, modification of the signal until the goal is met, using a signal which is ritualised, awaiting a response, terminating the signal when the goal is achieved and indicating satisfaction if the goal is reached or dissatisfaction if it is not reached (Iacono et al., 1998; Coupe & Goldbart, 1998). Stamp & Knapp (1999), who represent a dynamic approach, define intent as the product of interactions. Iacono et al. (1998) argue that it may be possible that in interaction including people with severe communication impairment, expressions other than alternating eye gaze may be used to achieve intent (Iacono et al., 1998). Additionally, Iacono et al. (1998) found that persistence, rate and modality-specific functions might be indicators of emerging intentionality (Iacono et al., 1998).

As mentioned above, the approach taken in the present paper is framed by CA. Hence, a sequential micro-analysis is produced and the focus of the study lies exclusively on what is observable and what the participants themselves treat as interactionally relevant. Intention is not regarded as a cognitive (intrapersonal) phenomenon, but as a social and inter-subjective one. Intention is not considered an individual inherent mental act but as something co-created by the participants and that emerges in the interaction, in a sequence of several actions (Coulter, 1979). Hence, the focus of the analysis is on what the participants treat as either intentional or as a display of intention. Henceforth, the terms *ascribe meaning/create meaning or display of intention will be used*.

2 Informants and settings

The data consists of two and a half hours of video recordings in total. Spoken and non-spoken contributions were transcribed using the CLAN programme (MacWhinney, 2000) in accordance with the conventions of CA (Ochs, Schegloff and Thompson, 1996). In order to capture all interactionally relevant actions, time-based transcriptions in ELAN¹ were also made for all demonstrated instances (see appendix). The latter included non-spoken, presumably interactionally relevant action (see appendix). The data were viewed several times and instances were transcribed where the girl did something that was responded to or where the girl responded to something that was said by the speaking co-participant. A total of 17 minutes were transcribed. The participants in the interaction were native speakers of Swedish, apart from the special education teacher, who was Icelandic but spoke Swedish fluently.

Interactions were recorded in three different settings: at home, at the girl's

grandparents' home and at school. The mother and grandparents had known the girl all her life and the special education teacher had known the girl for four years. The mother had attended a two-day course in bliss communication and, apart from her special education teacher's certificate, the special education teacher had several years of experience in teaching children with SSPI and intellectual disability, and a university course in AAC. The grandparents had received no formal training.

The girl, here called Maria, was 10;4 years old at the time of the recording. She has a severe speech, physical impairment and moderate intellectual disability due to cerebral palsy; dyskinetic syndrome. The physical disability affects her four limbs and she uses a wheelchair and acquires assistance for mobility. Maria has no reported visual or hearing difficulties, although she sometimes has hearing difficulties due to fluid behind the ear drum. Maria's language comprehension was assessed when she was 11;1 years old. The speech and language therapist stated that it was difficult to assess. The assessment was done in a structured play situation. At the time, no proven word comprehension was found. Maria's intellectual level was tested at age 10;9¹¹ and showed that she has a moderate intellectual disability. Maria attends a mainstream school where there is a special unit for pupils with severe physical impairments in combination with other impairments. Maria spends most of her time at school in the special classroom.

Maria has had a communication board with Blissymbolics (McNaughton, 1985) for four years. There are 209 symbols (size 3x3 cm) on the board. Maria indicates the symbols by direct selection, using her fist. According to Maria's mother and the speech and language therapist, the communication board is rarely used at home but sometimes at school. Some instances in the data show the use of the communication board. However, the excerpts demonstrated below do not show any use of the communication board, although it was accessible in two of the settings.

The interactions were filmed simultaneously by three video cameras mounted on tripods. A digital sound recorder was also used to capture audio data. The setting at home was in the kitchen, when the mother and Maria were baking a cake and when the mother, Maria, and the researcher were having afternoon tea. The setting at the grandparents' house took place when Maria was having her hair cut by grandmother, was looking at photos with her grandmother and listening to her grandfather singing songs from a song book. At school, the setting was a classroom where the girl and her special education teacher were playing a children's game called 'Ett skepp kommer

lastat' ('a ship comes loaded with ...' – direct translation to English). All interactions were naturally-occurring. The participants were told to do what they normally do, for example an activity in which they felt they had good contact with Maria.

Informed consent was attained from all participants. The research project was approved by the Swedish Ethics Committee (nr:2009-61) and is registered at the Danish Data Inspection Board.

3 Creating meaning with the coordination of gaze direction and movement

The aim of the following analyses is to demonstrate that gaze direction in coordination with movement is a practice that is employed to create meaning by the participants. Firstly, an analysis of three occurrences of gaze direction in coordination with arm and hand movement (out of five in the data) will demonstrate that the participants ascribe a context-specific sense-making action to this kind of coordination. Secondly, the analysis will focus on a specific instance which is also ascribed meaning, when Maria's gaze is coordinated with a vocalisation and movement, in contrast to the coordination with an arm/hand movement solely. Thirdly, the analysis will demonstrate an occurrence of the same phenomenon where the interaction seems to be influenced by competing agendas of the mother and her daughter, which have consequences for the practice. The practice of the gaze and movement coordination is pursued and upgraded with vocalisations by the girl and is eventually treated as a method to create meaning.

3.1 Coordination of gaze direction and movement as a method to ascribe meaning

As mentioned above, Maria's communication partners ascribed meaning to the coordination of gaze direction and arm/hand movement. The participants were found to do this recurrently, systematically and, thus, recognisably. In the transcribed data, five instances of interaction organised in this manner were found. In the excerpt (1) below, Maria (MAR), her mother (MOT) and the researcher (RES) (behind the camera) are going to have afternoon tea. Maria's mother has just taken three cartons of drinks out of the cupboard. (The glossing (gls), English translation is indicated below the spoken Swedish.)

EXCERPT 1:

- 93 MOT: vad vill du ↓ha
 gls: what do you want
- 94 ((walks toward MAR with drinks in hands))
- 95 MAR: ((slightly open mouth, gaze follows mother and drinks))
- 96 MAR: ((smiles))
- 97 (1.6)
- 98 MOT: päron?
 gls: pear
- 99 ((puts pear drink on table in front of MAR))
- 100 (0.9)
- 101 MOT: apelsin,
 gls: orange
- 102 ((puts orange drink to the left of pear drink))
- 103 (.)
- 104 MOT: eller jordgubb.
 gls: or strawberry
- 105 ((puts strawberry drink to the right of pear drink and puts mug in front of drinks))

figure a



- 106→a MAR: ((smiles, gazes towards strawberry drink and hand touches strawberry drink))
- 107 (4.8)
- 108 MOT: ↓jordgubb (.) ↑mm
 gls: strawberry (.)mm
- 109 MOT: ((takes pear drink and orange drink away))
- 110 MAR: ((stops smiling when MOT says jordgubb))
- 111 (3.6)
- 112 RES: mmm
- 113 MOT: det var ju tur vi köpte många sådana ↓idag då
 gls: lucky we bought so many of those today then

In line 93–94, Maria’s mother walks towards Maria, who is sitting at the table. The mother, carrying three fruit drinks, does a first pair part in a request for information, a question: *vad vill du ha* – ‘what do you want’. This is an open-ended question to which there are possibilities to answer for example by indicating a specific drink. However, the drinks in her hands limit the possibilities of a relevant answer. Maria follows her mother and the drinks with her gaze with her mouth slightly open. Maria smiles (line 96). Then, quite rapidly (line 98–105), after a pause of 1.6 seconds, the mother initiates a new turn, thus treating Maria’s conduct, the smile (in line 96) as an insufficient response, if any at all. Therefore, the mother takes a turn, by nominating ver-

bally each of three items that Maria can choose from, in the shape of a three-part list, as she simultaneously puts each of them in front of Maria: *päron* ('pear') – *apelsin* – ('orange') – *eller jordgubb* ('or strawberry') (line 98-105). The rising pitch of the word *päron* ('pear') indicates a continuation of the turn constructional unit (TCU) and the still intonation/prosody of the word *apelsin* also indicates an upcoming continuation of that TCU. The slightly falling pitch of the word *strawberry* is used to close the list of items to choose from as well as the TCU. The overall function of the turn seems to be to narrow down the open-ended question to a question with three possible answers.

The rapidity with which the mother initiates the second turn may indicate that the mother does not expect a response from Maria at that point and that she knows that there has to be some specification (i.e. a list of alternatives) for it to be possible for Maria to answer. The second turn is recipient-designed by the mother – produced in a way which makes it possible for the recipient to respond. The mother constructs a list of alternatives, each alternative creating a possible response represented by an object that can be indicated by Maria through gaze or an arm/hand movement. Additionally, the objects are put on the table, thereby presented in such a manner that Maria has a possibility to indicate an answer, making it relevant for the girl to touch an object or point at it.

Upon completion of the list (line 105), Maria responds (line 106) by continuing to smile and, at the same time, by gazing directly at the strawberry drink. Furthermore, she moves her arm and touches the strawberry drink, hence coordinating her gaze direction with her arm/hand movement. In line 108 then, the mother responds to this, by confirming and presenting an understanding of *jordgubb* ('strawberry') with a falling pitch. The falling pitch contributes to closing the activity of choosing drinks. By confirming Maria's response with a closing pitch, the mother thus treats Maria's gaze direction and arm movement towards the strawberry drink as an action that is positioned as a second pair part to her request for information. She treats it as a response, a response which is ended. The completion of the question-response sequence is finalised when the mother takes away the other two candidate drinks. This action can be regarded as a 'sequence closing third' (Schegloff, 1996; 1998).

At the point where the mother starts to voice *jordgubb* ('strawberry') (line 108), as a response, Maria stops smiling and stops the movement of the arm/hand. This conduct can be understood as a confirmation of her mother's voicing as correct. Therefore, Maria closes the list-sequence by stopping the smile and the movement. If the response from the mother had not been accepted by Maria, she could have persisted in her action or expanded it (as will be shown

in excerpt 5). This was apparently not the case, which indicates that the interpretation by the mother was the desired one.

Hence, Maria's smile and coordination of gaze direction towards the strawberry drink and an arm/hand movement touching the strawberry drink is treated by her mother as a response to the request for information. This indicates that Maria wants *jordgubb* ('strawberry'). Maria's action is thus ascribed a meaning by her mother, the meaning that Maria responds by picking the drink she wants. Maria's coordination of smile, gaze direction at an object and the arm/hand movement and touching of the object in this specific sequential position in the interaction is thus treated by her mother as a method of creating meaning in this context. The expected action from Maria in this local context makes the relevant response an expression of a choice. When the mother has confirmed *jordgubb* ('strawberry'), Maria stops her action. Thus, Maria orients to the method as accomplished when the acceptable response, the confirmation of *jordgubb* ('strawberry'), is produced.

The next excerpt (2) will show the employment of the same practice. The practice of coordination of gaze direction and movement by Maria is ascribed meaning by the speaking co-participant. This excerpt differs from excerpt (1) in that Maria is using the gaze-movement coordination in the production of an action that is treated as a first pair part of a request-answer sequence. Thus, the action is produced and positioned in a different sequential context, which makes the ascription of another meaning than in excerpt (1) relevant, although the same components and coordination are employed. The participants in the analysed sequence, Maria (MAR) and her special education teacher (PED) are in a classroom at school. Maria and her special education teacher are playing a children's game called 'Ett skepp kommer lastat' ('A ship comes loaded with...'). They have a toy boat which they send to each other. On the boat they put objects that are selected by the participants. The participants take turns in selecting an object that gets 'loaded' (placed) on the toy ship. At first, one participant says *Ett skepp kommer lastat* ('A ship comes loaded'). Then, the other participant says *med vadå* ('with what'). Now, the first participant says *med x* ('with x'), the object she has chosen. The object is placed on the 'ship' and is moved to the other participant's side of the table. The teacher has moved the 'ship' and has produced sounds which imitate a boat, every time one of the participants has chosen an object. In this instance, the boat has a doll's dress on it and the special education teacher is moving the boat from Maria's side of the table to her own side. The teacher is making, again, a sound of a boat.

EXCERPT (2):

251 PED: [ʃʃ tu:tutututututu ʃʃ
 252 ((tries to move boat))

figure b



253 b MAR: ((gazes towards boat))
 254 [((touches boat twice))
 255 (1.2)
 256 PED: du vill skicka iväg den (.) ja
 gls: you want to send it away (.) yeah
 ((moves MARs hand to other side of boat))
 257 (1.0)
 258 PED: [ʃʃ u:tutututututu ʃʃ
 259 [((PEDs hand moves MARs hand and boat to right))

In line 251 the teacher says *tututututu* in a whispering voice while she moves the boat to the left on the table, i.e. to the teacher's side, illustrating the boat in movement and in sound. The teacher has repeatedly done this action after the participant has chosen an object that has been placed on the 'ship'. The teacher is thus, again, doing this action as part of moving the game forward. At the same time, Maria gazes towards the boat while she moves her hand and touches the boat twice (line 254). In line 255, as a response to Maria's gaze direction and hand movement, the teacher says: *du vill skicka iväg den (.) ja* ('you want to send it away (.) yeah'). The teacher moves Maria's hand by the boat and supports Maria's hand to 'send' the boat while she combines the movement with the production of *u:tututututu* in a whispering voice. By saying *du vill skicka iväg den ja* ('you want to send it away (.) yeah' the teacher presents an understanding of Maria's action as a request sequence. The teacher, in line 256-257, then treats the request as a first pair part by producing a response to Maria's action in the shape of a second pair part. The teacher's response to Maria's action consists of a movement of her own, namely, she takes Maria's hand, puts it by the boat, and pushes it to the side (line 256-257). In and through her actions, the teacher attends to and grants the request of Maria which they then accomplish collaboratively. In this instance again, as in excerpt (1), Maria's coordination of gaze direction and movement and the touching of an object is treated as a method of accomplishing meaning, here

a request for an action. By contrast, in excerpt (1) the action was a second pair part to a request for information.

In these data, by visibly orienting (gazing) towards an object, the girl makes that object relevant to the talk - she 'points' with the gaze. In parallel to this, Streeck (1993) argues that by visibly orienting to hand-gestures you can make these overtly relevant to the talk (Streeck, 1993). In the materials at hand, the gaze is accompanied by a movement by the arm/hand to that object, which increases the relevancy of the object.

Excerpt (2) is another instance of where Maria's coordination of gaze direction and movement by the arm is employed as a method, a method to create meaning in a particular sequential context. The instance is similar to excerpt (1), apart from the fact that the facial expression, the smile, was not employed. The context was also different from excerpt (1) in that excerpt (1) was an instantiation of Maria doing a second pair part, a response to a question. In excerpt (2), Maria's action is treated as a request, a first pair part in an adjacency pair. This is responded to by the teacher, who first presents understanding of Maria's action and then attends to the request by responding, with a second pair part. The teacher's response is accomplished by gazing at the object and, moreover, by supporting Maria to do the requested action by a movement. The teacher, for her part, is supporting the movement of Maria's hand.

In excerpt (3) below, Maria (MAR) and her grandmother (GRM) are in the grandparents' living room, looking at photos in a photo album. This excerpt, as with the excerpts above, shows once again, that the coordination of gaze direction and movement is used as a practice to accomplish an action to which the participants ascribe meaning, although in yet another context. Previously, Maria has gazed at the left side of the photo album and moved her arm slightly. The grandmother has asked if Maria can point at Dodo (a relative), thereby giving Maria a task to perform. The grandmother has just said: *ser du var han är* ('can you see where he is'), *ja (.) var är Dodo* ('yeah where is Dodo') (not in the transcript). Maria has changed her gaze direction to the right side. The sequence continues as follows:

EXCERPT 3:

- 80 MAR: ((gazes at right side, puts down arm))
 81 GRM: ff kan du se det ff
 gls: can you see it
 82 MAR: ((still gazes at right side, starts moving arm))
 83 GRM: ff var är han ff
 gls: where is he

figure c



- 84 c MAR: ((puts fist/arm on photo right))
 85 (1.0)
 86 GRM: där är han ja
 gls: there he is yeah

In line 81, grandmother says *kan du se det* ('can you see it') in a whispering voice. The whispering voice can be understood as the grandmother encouraging or trying to make the task more interesting for Maria. By saying *kan du se det* ('can you see it'), the grandmother continues her request for an action, i.e. for Maria to point out Dodo, but she formulates it into a yes/no question. The preferred response to such a question is 'yes' or 'no', but Maria does not respond in such a way. Instead, Maria goes on with her business, which eventually is treated as a response to the previous question *var är Dodo* ('where is Dodo').

In line 82, Maria is gazing at the right side of the photo album and continues to gaze at the right side as she starts to move her arm. Maria's action in this participation framework (Goodwin, 2002) and in the direct juxtaposition to the request indicates that it is a response to it. While Maria is moving her arm, the grandmother continues the request for the action with the same whispering voice: *var är han* – ('where is he'). The grandmother's turn is a first pair part in a request for an action sequence. It makes a specific response relevant, namely a deictic word like 'there' or a pointing action. In line 84, Maria keeps on moving her closed fist and places it on the lower edge of the photo of two people (Dodo and Maria (?)). In line 86, the grandmother presents an understanding, a confirmation, *där är han ja* ('there he is yeah'), indicating that she has received a response and that it is the relevant response. Additionally, by saying *där är han ja* ('there he is yeah'), she indicates that Maria's response is terminated. Hence, she treats Maria's gaze direction and movement of the arm as a response. The *där är han ja* ('there he is yeah'), indicates recognition

and functions as a receipt (Mehan, 1979) of Maria's action. As a third turn in the question-response sequence which closes the sequence, it has the function of a sequence closing third (Schegloff, 1996). The *ja* ('yeah') in *där är han ja* ('there he is yeah'), emphasises the recognition. Hence, the meaning that is ascribed to Maria's action is a pointing and thus, it is ascribed a deictic meaning in this context. It is notable that, in this instance, the pointing is executed with the fist coordinated with gaze direction. Hands, legs or head are the commonly employed resources in pointing (Streeck, 2009), but in these materials the use of the fist seems to be a resource the participants agree on, when coordinated with gaze direction.

To sum up, in excerpt (3) as well as in excerpts (1) and (2), the participants use the participant with impairments' coordination of gaze direction and arm movement as a method to create meaning. In excerpt (3), similarly to excerpt (1), Maria's action occurs as a second pair part in a question-answer sequence. In excerpt (2) it occurs as a first pair part in a request-answer sequence. The ascribed meanings were: 1) a response that Maria wanted a strawberry drink, 2) a request to move the 'ship' and 3) a response to point out where Dodo was in the photo album. The positioning of the action accomplished in and through the mentioned coordination of gaze and arm/hand movement make the actions understandable as actions.

3.2 The coordination of gaze direction, vocalisation and movement as a method to ascribe meaning

Excerpt (4) is presented to demonstrate a method that has similarities to the one demonstrated above; although, in this instance, the speaking co-participant ascribes meaning to Maria's coordination of vocalisation, movement and gaze direction. The action is positioned as a second pair part in a question-answer sequence, a request for information. It is ascribed the meaning of a desire of Maria's.

Maria (MAR) and her teacher (PED) have just finished playing a game. The ordinary communication board (cbd) and another small communication board lie in front of them.

EXCERPT 4

276 PED: [vad tycker du vi ska göra nu]
 gls: what do you think we should do now
 277 PED: ((pushes MARs head, gazes at cbd, lips pressed))
 278 MAR: ((head orienting down))
 279 ((right arm/hand lying in front, on cbd, left arm folded))
 []
 280 (2.4)
 281 MAR: uh ((gazes down, head moves))
 282 PED: ((still gazes at cbd))
 283 MAR: ((right arm turns and moves to right side))
 284 (0.1)
 285 PED: mm ((still gazes at cbd))
 286 PED: ((moves head up))
 287 (2.5)
 288 MAR: u:u:h ((wiggles head, right arm moves to right side))
 289 PED: ((bends down head and orients gaze to MAR's gaze))
 290 (1.0)

figure d



291 MAR: E:E:h
 292 MAR: ((head moves up))
 293 MAR: ((gazes a bit further in front of cbd where small board is lying))
 294 (0.8)
 295 PED: [det är den du vill ha]
 gls: that 's the one you want
 296 ((takes up board, holds on right side of MAR))
 []
 297 PED: ((gazes at MAR and shows board))
 298 (1.6)
 293 MAR: [e:eng]
 294 [((raises torso & head, arm moves to right))]

In line 276, the teacher says *vad tycker du vi ska göra nu* ('what do you think we should do now'), thereby making a request for information. At the same time, the teacher pushes Maria's head upwards and orients her own gaze to the communication board, thereby making the communication board relevant for the next move(s) (Streeck, 1993).

In line 279-280, Maria turns her right arm and moves it to the right and says *uh*, as a response to the teacher's request for information. Maria's fist, which she sometimes uses to indicate a bliss symbol on the communication

board, is now placed outside the communication board. By this action, Maria is not indicating anything on the communication board, thus, not responding to the teacher's action of making the communication board relevant. Instead, Maria vocalises. The *uh* follows the request for information and in this context it can be treated as a response to the request – a response that alone is too broad to be sufficient as a response to what Maria wants to do. In line 285, the teacher responds by saying *mm*. As a response to the *uh*, it seems to function as a continuer, a minimal response (Schegloff, 1996).

In line 286, the teacher raises her head and gaze. This action signals that the communication board is no longer relevant for the ongoing interaction. In line 288, after a pause of 2.5 seconds, Maria says *u:u:h* while slightly moving her arm to the right and wiggling her head. This second vocalisation is prolonged and has a slightly different quality than the first vocalisation. In line 289, the teacher responds to the second vocalisation by bending down, orienting to Maria's gaze. In line 291-93, following a pause of 1.0 seconds, Maria vocalises a third time, says *E:E:h* while gazing in front of her in the direction of the small communication board, moving her arm to the right. The third vocalisation has a changed quality and is louder than the second vocalisation.

In line 295-296, following a pause of 0.8 seconds, the teacher responds by saying *det är den du vill ha* ('that's the one you want'), while she takes the small board and holds it diagonally in front of Maria. The teacher thereby presents an understanding of Maria's action. Maria's action was not treated as a response to the request but as a desire for an object. Thus, through gazing at something else than the communication board, Maria made that 'something else' relevant for the interaction instead. Another contextual configuration was made relevant (Goodwin, 2000). The simultaneous action of holding the board in front of the participants indicates that *den* ('it') refers to the small board. Notice that it is not until Maria coordinates the vocalisation with the gaze direction that the teacher treats Maria's conduct as a relevant action.

In response to the teacher's understanding, Maria raises her torso and head and vocalizes *e:eng*. Thus, Maria ends her action, coordinating vocalisation, gaze direction and movement, when the teacher presents her understanding and takes the small communication board, thus indicating that the teacher's action was the desired one. In addition, the following vocalisation by Maria, which has yet a different quality, and the raising of the torso can be understood as a confirmation of the teacher's understanding.

In this excerpt (4), the first pair part question makes the pointing at the

communication board a relevant next action. However, the girl does not perform the relevant action. After having ruled out that the large communication board will not be employed as a resource, the participants employ another method of creating meaning, namely, a method of coordinating different resources in order to do the action of ‘wanting’. However, resources other than those in excerpts (1), (2) and (3) are employed, namely, vocalisation, movement and gaze direction. Maria’s second vocalisation (line 288) attracts the teacher’s gaze to Maria’s gaze. Maria’s third vocalisation is coordinated with a gaze towards an object, the small board. This action is treated as creating meaning by the teacher, the meaning that Maria wants something in this specific context.¹¹¹

Excerpt (4) demonstrates another, but similar, method of creating meaning, where Maria coordinates her gaze towards an object with a vocalisation and an arm movement positioned in the specific context. Maria’s action is treated by the speaking co-participant as a first pair part act of ‘wanting’. Thus, excerpt (4) demonstrates that the coordination of different resources is once again treated as a sense-making method for achieving a common understanding by the co-participants.

3.2.1 Coordination of gaze direction, arm-/hand movement and vocalisation – a problematic instance caused by competing agendas

Excerpt (5) is presented to demonstrate an instance where there are competing agendas between what Maria is doing and what her mother is doing. On the one hand, the mother is occupied with showing a routine of what you are supposed to say before you start a meal. On the other, Maria makes a request, telling her mother that she wants a bun. The request is made through employing the method of coordinating gaze direction and arm/hand movement. This method is used systematically, recurrently and is thus recognisable (as demonstrated above in excerpts 1-4). The competing agendas lead to some difficulties but are resolved in the end. Maria, her mother and the researcher (RES) are sitting by the table, ready to have afternoon coffee. There are buns on a plate.

Due to the length of the excerpt, it is divided into two parts.

EXCERPT 5A:

119 com: MAR is looking at plate with buns from line 120-line 155
 120 MOT: [va säger man, Maria]
 gls: what do you say, Maria
 121 gazes at MAR
 []

figure e



122 MAR: ((starts moving arm from under the table tow mug on table, touches it and mug falls))
 123 (7.8)
 124 MOT: [va säger man]
 gls: what do you say
 125 | gazes at MAR |
 126 |((arm stretches at mug))|
 127 RES: [°muggen°]
 gls: the mug
 128 MOT: ((raises mug))
 129 MAR: ((touches red plate, still gazing in direction of buns))
 130 (1.7)
 131 MOT: []
 ja jag vet att du vill ha bulle men vad säger man först
 gls: yeah I know that you want a bun but what do you say first
 132 [((gazes at MAR))]
 133 (2.2)
 134 MAR: ngu:ung
 135 ((raises head, gazes at buns))
 136 (0.1)
 137 MOT: varsågoda ja
 gls: here you are yeah
 138 ((gazes at table and RES and raises torso and smiles at RES))
 139 RES: []
 mmm (0.8) tack
 gls: mmm (0.8) thanks
 140 [((rises torso))]

In line 120, her mother says *vad säger man, Maria* ('what do you say, Maria'), clearly allocating the turn to Maria by gazing at her and addressing Maria verbally (*Maria*) at the end of the turn. In producing that action in this position (a first pair part in a request for an action), the mother establishes the trajectory for a specific response, namely a phrase that is part of a custom in many Swedish families, to say *varsågoda* ('here you are') before you start a meal. Simultaneously, in line 122, when Maria is gazing at the table, she

moves her arm from under the table up to the mug on the table in front of her. Maria's arm reaches the mug, pushes it and it tips over. In line 124, after a pause of 7.8 seconds, the mother lifts the mug and repeats *vad säger man* ('what do you say') and gazes closely at Maria. Thus, the mother produces a partial repeat and thereby pursues (and by shortening it also clarifies) the action of requesting Maria to perform a specific response while apparently not attending to and responding to Maria's action. In excerpts (1), (2) and (3), the same action (the coordination of gaze and arm/hand movement) is treated as a method of creating meaning in different contexts, e.g. an answer to a request for information, a request and a pointing as a response to a request for an action. By repeating *vad säger man* ('what do you say'), the mother, apart from pursuing and clarifying her action, does not respond to Maria's action. At this point, the researcher says *muggen* ('the mug') in a quiet voice, apparently attending to Maria's actions using the same practice as we have demonstrated above, presenting an understanding of Maria's actions. At this point, in line 129, Maria moves her arm again, but this time towards the red plate while gazing at it. Maria is, thereby, once more using the coordination of gaze direction and movement as a practice to achieve shared understanding, but now she moves her arm towards the red plate. This action (line 129) can be understood as a repair (or reformulation) of the previous action.

Hence, instead of producing the relevant response pursued by her mother, Maria continues with her own business, making a request for an object, the bun. In line 131, in response to Maria's action, her mother says *ja jag vet att du vill ha en bulle men vad säger man först* ('yeah I know you want a bun but what do you say first'). With this response the mother indicates that she acknowledges and ascribes meaning to the practice of coordinating gaze direction and movement, but that something else is a relevant next, namely to say *varsågod* ('here you are'). Hence, the mother shows that the practice of coordinating gaze and movement is still a methodically produced action that they share an understanding of, but that it is something else, namely saying the word *varsågod* ('here you are') that is more relevant in the local interaction. As a response to that, Maria finally raises her head and does the pursued action as she vocalizes *ngu:ung*, in line 134. Mother says *varsågod ja* ('here you are yeah'), thereby presenting an understanding together with a *ja* ('yeah'). The *ja* ('yeah') functions as a receipt of Maria's action (see excerpt 3). The mother's response indicates that she treats Maria's response, the vocalization *ngu:ung*, as the relevant one. Additionally, the mother now smiles and gazes at the researcher and raises her torso, indicating that the relevant response has been

received. The researcher gazes at the mother and raises her torso, indicating alignment to the mother’s actions. The researcher also responds to *varsågod* (‘here you are’) by doing a second pair part, *mmm* and after 0.8 seconds, a tack (‘mmm (0.8) thanks’).

The sequence continues as follows.

EXCERPT 5B

141 MAR: ((arm touches red plate))
 142 (1.6)
 143 MAR: ruuuh
 144 ((pulls red plate tow herself, still gazing at table, red plate?))
 145 MOT: ((gazes at MAR and at plate))
 146 (0.9)
 147 RES: mmm ↗ (0.6)
 148 du [vill ha den]
 gls: you want that
 149 MAR: [l:l: l:H=
 150 ((moves red plate tow MOT))
 151 MOT: = ja du ska |jamen lilla maria
 gls: yeah you will|yeah but little maria
 152 ((moves MARs hand from plate))
 []
 153 (0.7)
 154 MOT: du- [(0.8)]
 gls: you-
 ((gazes at MAR))
 []
 155 MOT: (ska) du [ta den]
 gls: (shall) you have that
 puts bun on red plate in front
 [of MAR]
 156 (0.9)

After having accomplished the task that Maria was allocated by her mother, Maria again gazes in the direction of the bun and moves her hand/arm towards the red plate, thereby continuing the same action as before (line 144). Additionally, it is accompanied by a vocalisation *ruuuh* (line 143-144).

In line 145, as a response to Maria’s gaze and arm/hand movement, mother now finally follows Maria’s gaze and movement with her gaze and the researcher says *mmm* with a rising intonation. After a pause of 0.6 seconds, the researcher continues *du vill ha den* (‘you want that’), voicing and doing a can-

didate understanding of Maria's action. This indicates that she treats Maria's gaze direction, movement and vocalisation as signalling that she wants den ('that'), inferring the bun. In overlap with *du vill ha den* ('you want it'), Maria makes another vocalisation *I:I: I:H*, that has a change of quality and a higher volume, similar to a scream. Upon the completion of the vocalisation, in line 151, as a response to the second vocalisation, the mother says *ja du ska* ('yeah you shall'). She apparently treats the gaze direction, movement and vocalisation as if Maria wants something and acknowledges it. The mother responds by saying *jamen lilla Maria* ('but little Maria'). This can be understood as if she treats Maria's vocalisation as an impatient reaction. She continues to say *du* ('you') followed by a 0.8 second pause and then *ska du ta den* ('shall you have that'), simultaneously as she takes a bun and puts it on the red plate. This turn is designed linguistically as a question but the wording accompanied by the movement indicates an action of a response to Maria, a fulfillment of her request.

In this excerpt, there are two competing agendas at play; one is a request from Maria and the other is the mother's insistence on manners by saying *varsågod* ('here you are') before you start a meal. In line 138, after the mother's voicing of *varsågod* ('here you are'), the mother gazes at the table and the researcher, raises her torso and smiles at the researcher. Additionally, this indicates that the action of Maria was a display to the researcher that Maria can produce the expected action. The researcher aligns in line 140. It is apparent that the mother knows the practice of coordination of gaze direction and movement, in that she says *ja jag vet att du vill ha bulle* ('yes I know that you want a bun'), in line 131. By embedding an understanding of Maria's action in, at first: *ja jag vet att...* ('yes I know that...') and then adding a next TCU, *men vad säger man först*, ('but what do you say first'), the mother treats Maria's action as a side sequence (Jefferson, 1972). By treating it as a side sequence, she shows Maria that another response is a relevant next, at the same time as she acknowledges Maria's action.

In line, 142, after completing the mission of showing manners, a pause of 1.6 seconds occurs. Then Maria vocalises *ruuh*. Hence, after twice using the practice of coordinating gaze direction and movement, the relevant response is still lacking. In lines 143-144, Maria repeats the coordination of gaze direction and arm/hand movement that she produced in lines 122 and 129. This is upgraded by adding a vocalisation. This action is ascribed meaning by the researcher in her action *mmm du vill ha den* ('yeah you want that'), confirming an understanding of Maria's action. Maria's request is, however, not respond-

ed to by the mother or researcher. Then Maria vocalises I:I:I:H and moves the red plate towards her mother. Thus, after another upgrading, (line 149-150), by changing the quality and increasing the volume of the vocalisation, in line 151, the mother responds immediately and fulfills the request. It is notable that it is not until after the request has been granted that Maria breaks off her action. This indicates that the gaze direction in coordination with arm/hand movement was treated as it was meant to be: both the co-participants oriented to it and it worked, even if it had to be upgraded with vocalisations of a different quality and even if it took some extra interactional work.^{IV}

Hence, excerpt (5) demonstrated an instantiation of when the method of coordinating gaze direction and arm/hand movement was employed together with vocalisations to create a shared understanding. Maria made a request in the specific context but her action competed with her mother's action.

4 Discussion

This paper is an investigation of how everyday interaction is accomplished between a girl with SSPI and moderate intellectual disability and some of her everyday communication partners: her mother, grandmother and teacher. The researcher is also present in excerpts (1) and (5).

A question that communication partners and professionals deal with on an everyday basis is – When can we determine that Maria ‘says’ something? The present analysis gives one answer to that question. To create meaning, the participants systematically and recurrently employ the method demonstrated here. It consists, firstly, of the girl coordinating gaze direction and arm/hand movement and the speaking co-participant ascribing meaning to it in the specific context. Secondly, the girl can also coordinate gaze direction, vocalisation and movement and it is also ascribed meaning by the speaking co-participant.

In addition, the analysis showed that the context is used by the participants to specify the meaning.^V The analysis demonstrated several different exchanges: when asked about what drink she wanted, Maria showed that she wanted a strawberry drink, excerpt (1); when playing a game with a boat, Maria wanted to move the boat excerpt (2), when asked ‘where is Dodo’, Maria pointed to where Dodo was excerpt (3). Maria showed that she wanted a small board in excerpt (4), and in the last exchange, when starting afternoon coffee, Maria showed that she wanted a bun excerpt (5). Hence, the analysis demonstrates that, through employing the sequential organisation of the ongoing interaction and the relevant participation framework (Goodwin, 2002),

the participants create meaning from one participant's coordination of gaze direction and arm/hand movement.

In four excerpts out of five in the present paper, the meaning that is ascribed is 'wants'. In one excerpt, it was ascribed a deictic meaning (exc. 3). In Excerpts (1) and (3), the ascribed meaning occurs as a second, in a question-answer request sequence. In excerpts (2), (4) and (5), the meaning ascribed is a request by Maria.

In excerpts (1) and (3), Maria does a second pair part in a question-answer sequence, and in excerpts (2), (4) and (5) she does a first pair part request. In excerpts (2) and (4), the request is treated as the main sequence and in excerpt (5) the request is at first treated as a side sequence. In excerpts (4) and (5) another method is employed; namely, the coordination between gaze, vocalisation and movement.

The meaning that is ascribed in the instances is, as mentioned, highly context-dependent. When the action occurs after a first pair part in a question sequence, the contextual cues should make it easier to ascribe a meaning to the following actions. This may be one reason why interaction with people with severely challenged communication capacities is known to be dominated by questions from the speaking communication partner (Light, Collier & Parnes, 1985b; Björck-Åkesson, 1992). It is probably easier to make sense of a person's actions in a sequence where the first part is provided. This finding is supported by the findings of Clarke and Wilkinson (2007).

However, it is notable that the excerpts also demonstrate three instances where the girl does first pair parts in a sequence, i.e. where the girl makes three requests.

How can we know that Maria 'says' something? As mentioned in section 1.4.1, it is always difficult to know someone's communicative intention. In these materials, it is even more difficult, due to the non-conventional and individual communicative expressions (Iacono et al., 1998). The unconventional and subtle signals used by Maria can raise doubts as to whether they are to be ascribed meaning or not. However, the data at hand show that intention/meaning is collaboratively achieved in the interaction process using the method demonstrated in the analysis. I have demonstrated that Maria's conduct is ascribed meaning by the speaking co-participant and that Maria's conduct is ascribed intentionality, as a contribution to the ongoing local interaction. One method that is employed to achieve a shared understanding is the use of coordination of gaze and arm/hand movement by Maria. Another method is the coordination of gaze, vocalisation and movement. Maria ends

the action of coordinating the gaze with the arm/hand movement when it is treated in the way it is treated. This indicates that Maria's action and method was an action for interaction. Additionally, it indicates that both the girl with impairments and the co-participant orient to the method of coordinating gaze direction and arm/hand movement. Sometimes Maria's action is not treated in a way that she accepts, see exc (5). Then she pursues and upgrades the action until it is treated and responded to in what is for her an acceptable manner. Nobody can be sure if it was the girl's initial intention. Still, in the end she accepted the way it was treated by her mother. These findings support several frequently used behavioural criteria of intention (Iacono et al., 1998); the persistence, the modification of the behaviour if the goal is not reached and the termination if the goal is reached.

The coordination of gaze direction and movement is used as a method of indexing a target by the girl that has the effect of establishing a joint focus for the participants. This target is then fitted into the unfolding interaction and the local sense-making. Among the ecologies of gestures, suggested by Streeck (2009), this method may pertain to the ecology of 'disclosing the world within sight' in that it enables the participants to mutually orient to something in their physical surroundings. However, it has greater import than that, since it also contributes to the main content of the girl's contribution in the interaction and could maybe be seen as a 'depiction' of the world.

It is noteworthy that the participants in these materials create meaning solely through the coordination of natural, non-spoken resources. They do not create meaning through employing a formal AAC system, i.e. the pointing at graphic symbols (linguistic building blocks) and non-spoken resources and methods in combination with this (see Sigurd Pilesjö, *forth.*). Hence, the turns are organised differently. They are not organised in the step-by-step, collaborative building up of one or several [symbol pointing+voicing] elements in a TCU-based turn, as was found in another study by Sigurd Pilesjö and Rasmussen (2011). The participants taking turns in the present data do not orient to language and talk as a constitutive feature of the actions. The turns lack pre-beginnings and post-completions as well as the projectional cues of grammar and prosody (Sigurd Pilesjö and Rasmussen, 2011).

In these data, the girl does not use mutual or alternating gaze as a resource to create meaning. Mutual gaze is a common resource employed in creating meaning. This finding is supported by Iacono et al. (1998), who question whether or not mutual gaze has to be a prerequisite, when creating meaning in interactions with people with multiple disabilities.

Other researchers mention that the collaborative construction of meaning in interactions with people with severe communication impairments can be rather difficult (Finlay, Antaki & Walton, 2007). There is often no way of resolving ambiguity by asking the person with severe disabilities what he/she really meant. There is always a risk of infringing the rights of the person with disabilities by invalid ascription of meaning (Grove et al., 1999). Thus, it is essential to be careful with interpretations in the data at hand (Björck-Åkesson, 1992). A detailed sequential analysis, such as the present one, can help parents and professionals to find out what actions are accomplished between the person with impairments and her/his communication partners.

In ordinary interaction we talk about recipient design (Sacks, Schegloff & Jefferson, 1974); that is, tailoring one's actions to the circumstances of a given interlocutor. It is not evident to talk about this in the data at hand (Finlay, Antaki & Walton, 2007). We can, however, observe that the actions of the person with SSPI and moderate intellectual disability are responded to and ascribed intention and meaning by the speaking co-participant. They are sequentially fitted into the ongoing interaction. The co-participant is responsive to the orientation of the person with SSPI and moderate intellectual disability. In excerpt (1), the co-participant also adjusts her request in such a manner that the girl has the opportunity to answer. The co-participant is sensitive to the actions of the person with impairments' display of attention and actions within the local 'contextual configuration' (Goodwin, 2000). The term 'contextual configuration', proposed by Goodwin (2000), is suitable when describing interaction in these materials. It refers to several semiotic fields that the participants orient to in the locally unfolding interaction. In this case it is the modalities that are used (e.g. talk, coordination of gaze direction and arm and hand movement), the artefacts (e.g. a drink, a boat) and the sequential organisation (what comes before or after her behaviour). As the interaction develops, new semiotic fields can be added. This means that the contextual configuration undergoes a constant change. All these features are related to locally by the participants and are of vital importance when creating meaning.

The findings show that the speaking co-participants are consistent and systematic in their interpretation of Maria's systematic coordination of gaze direction and arm/hand movement or gaze direction and vocalisation. This is of major importance when it comes to developing the communicative competence of a person (Brodin, 1991; Björck-Åkesson, 1992). To foster competencies in more complex communication, teams must thoroughly understand the

system of communication a person with multiple disabilities employs (Tucker & Kretschmer, 1999). This system includes not only the person's individual repertoire for non-symbolic communication but also the characteristics of her/his communication partners. The key to advancing communication and social interaction is through the system of meaningful interaction with others that already exists for the person with multiple disabilities (Snell, 2002). A growing number of assessment and intervention programmes view communication as a collaboratively accomplished construct (Olsson, 2004). The present study supports this view.

Those in the social surroundings in which Maria is embedded adapt to the challenges caused by the impairment and shape a framework for the organisation of interaction so that Maria is able to function as an active participant. Resources and tasks are distributed differently than in ordinary interaction and other practices emerge. This is also found in other challenged interaction (Brouwer, Day, Ferm, Hougaard, Rasmussen, Thunberg, 2011; Sigurd Pilesjö and Rasmussen, 2011; Goodwin, 2002).

In analysing interaction between a person with aphasia and his communication partners, Goodwin (2002) argued for a new dynamic unit of analysis, a 'multiparty participation unit'. It is suggested that this unit includes all participants' bodies and the talk that explicates the gesture. This unit would be well suited to analysing the interaction in the present study, where the action of coordinating gaze and movement does not stand alone but operates together with the participants' bodies and the co-participant's explicating talk in the sequential organisation and specific participation framework.

Finally, this study illustrates that meaning in the data at hand is co-constructed. Awareness of this can help to overcome concerns at not being able to make the 'correct' interpretations depending on the weak signals from the person with communication impairments. The process of co-constructing meaning can be a rewarding process in itself (Olsson, 2004).

Almost everyone lives in a context made up of other people, and as people are social creatures, communication emerges (Grove et al., 1999). In other words, no matter what resources are available, people organise interaction in sense-making practices. Hence, although the interaction can be heavily challenged, when analysed sequentially, including all modalities, the interaction is found to be orderly, systematic and thus recognisable to the participants.

Additionally, in order to undertake clinical intervention, it is essential to know how the interaction is accomplished (Snell, 2002). The characteristics of how interaction with people with disabilities is achieved should be inves-

tigated in its own right and not as something that differs from interaction between people who do not have disabilities (Kraat, 1985).

There is a need to look into what resources and methods other people with SSPI and intellectual disability employ when they create meaning with their everyday communication partners.

5 Conclusion

The present study is an investigation of methods and resources that are employed in interaction between a girl with SSPI and moderate intellectual disability and her communication partners in order to create meaning. One of the participants has several impairments and is not able to use speech as a resource in interaction.

The findings show that the interaction depends on visual/non-spoken resources to a high degree. Resources such as gaze direction, arm/hand movement and vocalisation play an important role.

It is argued that, by conducting a detailed sequential analysis with an interactionist perspective and examining in detail the naturally occurring interactions between a girl with SSPI and moderate intellectual disability and her everyday communication partners, it is possible to extract a method that is used recurrently, systematically and thus recognisably when accomplishing shared understanding.

The method, observed in the present study, consists of the girl doing an arm/hand movement in the direction of an object, and simultaneously gazing towards it. She selects one target from several others in the environment, thus indicating the theme of her action. In creating meaning, the child coordinates different resources: directs her gaze and arm/hand movement (and sometimes vocalises) in the same direction.

The meaning that is ascribed to these coordinated moves is highly context dependent. In the excerpts, the actions of 'wanting' and 'pointing' were accomplished. The artefacts in the surroundings, the sequential organisation and the participation framework (Goodwin, 2002) are crucial factors involved when the participants create meaning. These features are salient in analyses taking into account the simultaneous use of several resources. By using CA as a research method on this kind of interaction, important features appear and the interaction can be better elucidated.

Furthermore, the study highlights the role of the communication partner. Due to the impairments of one of the participants, the tasks in the interaction are distributed differently from ordinary interaction. The speaking co-partic-

ipant has to be more active and do more work and s/he has a great responsibility. S/he is sensitive to the display of attention and the visual actions of the participant with impairments within the local 'contextual configuration' (Goodwin, 2000). Had it not been for this sensitivity in the present study, the method would not have been successful.

6 Clinical implications

Video recordings of naturally occurring interaction with everyday communication partners are recommended in assessment and intervention. By conducting a detailed sequential analysis and taking into account all visible action, we can find out how interaction with the person with SSPI and moderate intellectual disability is organised and what resources and methods are employed to make it work.

The present study supports Olsson & Granlund's (2003) recommendations for best practice for people at a pre-symbolic level, where they stated that, in four out of ten variables, intervention (including assessment) should focus on: 1) interpersonal problems rather than performance and skill problems, 2) careful and detailed descriptions of the context in which the interaction is studied, 3) unique features for functional communication in unique dyads rather than preset variables as the focus of intervention, and 4) assessment containing descriptions of what is actually going on rather than restricted options set by the researcher (Olsson & Granlund, 2003).

A detailed analysis can disclose the subtle multiple resources that are used. The findings illustrate what the everyday communication partners actually do in interaction with a child with severe disabilities. It is important to give verbal expression to what the participants accomplish. Everyday communication partners achieve many things that make the interaction work smoothly, but they may not be aware of how this is organised. It is essential to affirm the participants' behaviours (Hostyn et al., 2010). Findings of this kind can add to the confidence of the child's communication partners and can be the starting point to further communicative development. Increased knowledge of what is going on in the communication process can raise the awareness of the role of the communication partner and increase the interest and motivation to continue improving their interactions with people with impairments of this kind.

Raised awareness of the resources and methods that are employed can make the interaction work better. In addition, knowledge about other essential features, such as artefacts and the sequential organisation, can contribute

to ameliorated intervention. Information about the practices and resources to communication partners that are not acquainted with the person with impairment can make the interaction work better with other people than everyday communication partners.

There may not be enough time to do a detailed sequential analysis in everyday intervention. Nevertheless, case descriptions like the one in the present study can heighten the awareness of everyday communication partners and professionals as regards interaction with people with SSPI and moderate intellectual disability.

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APPENDIX

Transcription Notations

Two transcripts are demonstrated in the article. Transcript (1) is in the text.

1. The transcriptions presented in this paper combine the CA transcription proposed by Ochs, Schegloff and Thompson (1996) in combination with the proposed transcription conventions in AAC by von Tetzchner and Hygum Jensen (1996).

The time-based transcription (2) is in this appendix.

2. ELAN transcription is also used for specific parts of the whole excerpts. Letters and an arrow (for example a →) indicate where the ELAN transcript matches the other transcript.

Transcript 1:

dog ordinary writing indicates naturally spoken elements, vocalisations and laughter.

CAT capital letters indicate talk delivered at a louder volume than the surrounding talk.

cat underlining indicates emphasis.

. a full stop indicates a falling, or final intonation contour.

°cat° degree signs indicate a passage of talk or a vocalisation which is quieter than surrounding talk.

ˉeeahˉ indicate a vocalisation or spoken element delivered in higher pitch than the surrounding talk.

>cat< The combination of “more than” and “less than” symbols indicates that the talk between them is compressed or rushed.

(.) a full stop or number in single brackets indicate an interval in the stream of the previous talk above in the transcript. A dot indicates an interval of one tenth of a second or less. A number in single brackets indicates the length, of the interval in tenths of a second.

≈ a ‘wavy’ equal sign marks where there is no interval between adjacent actions.

- [a left-hand bracket links ongoing action with overlapping action at the point where the simultaneous action begins.
-] a right-hand bracket links ongoing action with overlapping action where the simultaneous action stops.
- cbd represents a communication board.
- SMAKA* capital letters in italics indicate pointing at the bliss symbol for SMAKA (taste) on the communication board.
- (*TASTE*) single brackets mark where target item(s) is/are in doubt.
- ((nods)) double brackets indicate a description of non-spoken elements/ actions that can be interactionally relevant.
- gls: represents a glossing, translation into English.

Time-based ELAN transcription

Transcription notations

M	Maria
M gaze	indicates Maria's gaze direction
MOT	mother
GRM	grandmother
GRF	grandfather
PED	special education teacher
X talk	talk of X
hon e	hon e inte där= she is not there
MAR vocal	Maria's vocalisation, for example EEAAH
EEAAH	vocalisation in high intensity
°eeah°	vocalisation in low volume
<u>eeah</u>	vocalisation with emphasis
arm h, arm hit t	arm hits the table
X body movement	X's movements of head, arm/hand and other movements

Ped gaze [17]	00:00:03.000	00:00:04.000	00:00:05.000	00:00:06.000	00:00:07.000	00:00:08.000	00:00:09.000	00:00:10.000	00:00:11.000	00:00:19.000
	at cbd	at cbd	searching on cbd						at Martha	
Ped talk [4]		vad bycker du v ska góra nu			inn					
Ped movement [1]		raises Ms head	head closer cb	head moving around oriented to cbd	head up				head to Ms sl	bending c
Ped facial express [11]			lips pressed t							
Martha voc [4]		down		uh					u:uh	
Martha gaze [3]		down diagonal. at cbd?								
Martha arm movem [4]		arm lies on cbd, on table		arm turns ove	lifts arm, list outside cbd					moves r arm to right, low
Martha facial expre [6]										
Martha head [5]		lifted by Ped							wiggles	

Ped gaze [17]	00:00:08.000	00:00:09.000	00:00:10.000	00:00:11.000	00:00:12.000	00:00:13.000	00:00:14.000	00:00:15.000	00:00:16.000	00:00:17.000	00:00:18.000	00:00:19.000
	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha	at Martha
Ped talk [4]		head up		head to Ms sl	bending down head	takes chart	shows chart					
Ped movement [1]												
Ped facial express [11]												
Martha voc [4]		u:uh		EEh					e:eng			
Martha gaze [3]		at plastic chart										
Martha arm movem [4]		ove lifts arm, fist outside cbd		moves r arm to right, towards chart and l arm moves dow								
Martha facial expre [6]				wiggles								
Martha head [5]				rears up				up				head up

EXCERPT 4 (In this excerpt Maria is called Martha)

00:51:53.000	00:51:54.000	00:51:55.000	00:51:56.000	00:51:57.000	00:51:58.000	00:51:59.000	00:52:00.000	00:52:01.000	00:52:02.000	00:52:03.000	00:52:04.000
M vocalization [3]											
M gaze [4]	in front at red plate										
M body movement [6]		moves hand low mug w	hand on table, moving				pushes red plate			risers head	
M facial expression [2]										smile	
MOT talk [7]			vad säger								
MOT gaze [13]								at M			
MOT body movement [8]						moves hand low mug and rises mug			lifts red plate		

00:52:04.000	00:52:05.000	00:52:06.000	00:52:07.000	00:52:08.000	00:52:09.000	00:52:10.000	00:52:11.000	00:52:12.000	00:52:13.000	00:52:14.000	00:52:15.000
M vocalization [3]	ngung										
M gaze [4]		gaze direction low table, red plate									
M body movement [9]	sad						pushes red plate with hand				risers head
M facial expression [2]											
MOT talk [7]	varslagods ja									ja du ska	jamen lilla Martha
MOT gaze [13]		turns to table					at M	at red plate	at M	at Ms hand	at buns
MOT body movement [8]											at M

00:52:14.000	00:52:15.000	00:52:16.000	00:52:17.000	00:52:18.000	00:52:19.000
M vocalization [3]					
M gaze [4]	at bun				at bun
M body movement [6]		risers head			
M facial expression [2]					lips a
MOT talk [7]	men lilla Martha	du	(ska) du ta	så får RES välla där	
MOT gaze [13]		at M	at plate with buns		a
MOT body movement [8]				puts bun on red	pushes plate to
MOT facial express					

EXCERPT 5

- I) ELAN <http://www.mpi.nl/tools/elan.html>
- II) The assessment of intellectual abilities was made with WISC-IV (Wechsler, 2003), Leiter-R VL (Roid & Miller, 2004), Merrill Palmer (Roid & Sampers, 2004) and discussion with mother and staff. It was made by the psychologist in the team.
- III) It is noticeable that it is not until the prolonged second vocalisation by Maria occurs that the teacher orients her gaze to Maria's gaze direction.
- IV) In line 145, the mother can be awaiting the relevant action in the ritual by the researcher - to serve herself a bun. This can be the reason why the mother does not grant Maria's request in line 145. Instead, after Maria's vocalisation, the researcher gazes at Maria and says: *Du vill ha den* ('You want that'), apparently focusing on Maria's action instead of on the ritual.
- V) This finding is supported by other studies as well (Brodin, 1991).

