

AUTISM, COMMUNICATION, LEARNING



Caption of the World by a Child with ASD

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Autism, Communication, and Learning:
Reaching mutual understanding in a learning situation

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Abstract

Societal issues of children with diagnoses not attending school, as well as recent literature, have highlighted the need for revising the perspective of deficits in children with ASD, to a new perspective of atypical interaction as having communicative functions. This study explores how mutual understanding is achieved through interaction in a learning situation between a mother and her child. The sample includes a six-year-old boy, diagnosed with autism, and his mother during home training of cognitively enhancing tasks. Using Conversation Analysis, this study researched the underlying components of the interaction in home videos of learning situations. Results showed that the mother maintained and controlled the setting and structure of the learning situation, using institutional sequence structure and attention repairs, which positively influenced the child's engagement. However, a rigid preference organization and self-talk, resulted in a loss of attention. Furthermore, the results showed that the boy exhibited atypical actions, such as repetitive gestures, which served as a communicative purpose, and atypical conversational practices served as information seeking abilities. The results highlight the importance of mutual understanding in a learning situation, as this can be reached by understanding atypical conversation actions, rather than overcoming deficiencies.

Autism, Communication and Learning: Reaching mutual understanding in a
learning situation

Difficulties with social competences and impairments regarding verbal interaction are characteristics for autism spectrum diagnoses (ASD), thus many children with ASD struggle with language and communication (Irvin, Boyd & Odom, 2015; Mucchetti, 2013). Children with ASD often struggle with novel instructions and assigned tasks in school settings because of said difficulties and difficulties with cognitive processing (Young, Hudry, Trembath & Vivanti, 2016). Multiple intervention forms are designed to teach language skills to children with ASD (Barbera & Rasmussen, 2007; Greer & Ross, 2008; Petursdottir & Carr, 2011; Sundberg & Partington, 1998 as cited in Delfs, Connie, Frampton, Shillingsburg & Robinson, 2014). In addition, children with ASD have difficulties interpreting socio-cultural identities, dispositions and institutions (Ochs & Solomon, 2004). Teaching children with ASD how to interact in the social world is intervention that applies clear, structured rules to aid them in interactions, including how to read body language, facial expressions, and interpreting jokes (Taylor, 2011). Both authors have been working with such intervention form as a part of the Center for Applied Behavioral Analysis (CAA), located in Denmark. This intervention form is based on the behavioristic approach, Applied Behavioral Analysis (ABA), focusing on the children's developmental competency level. ABA is implemented as interventions for children with ASD to develop or enhance social and cognitive abilities through different tasks in home or school settings, with a goal of reaching as much independence as possible in later life. While working with such intervention forms with children with ASD both authors of this study, have become aware of difficulties and issues related to communication and school settings. We have observed that it

can be a challenge for children with ASD to manage him- or herself in a crowded environment, which includes structures and expectations that seem beyond their abilities to process.

In Denmark non-neurotypical children often attend special classes or are attending inclusive neurotypical schools, as these two options are part of the offered school programs. Inclusion in neurotypical classrooms can be observed to refine some of the social difficulties that children with autism experience (Irvin et al., 2015), as the opportunity to interact and observe other children with competent social skills can promote social interaction (Bailey, McWilliam, Buysse, & Wesley, 1998; Brown, Odom, McConnell, & Rathel, 2008 as cited in Irvin et al., 2015). Even though inclusion seems to result in positive outcomes, there are also downsides. Danish television news program called *21Søndag* aired a feature concerning the inclusion of children in neurotypical schools (DR1, 2018, March 4). The feature implies that it is impossible to find a suited school program for children with psychological diagnoses within a reachable transportation distance. Furthermore, it is mentioned that fewer children with diagnoses attend school, since they often stay at home. During the previous two school years, 150 schools experienced that one or more students have been absent for three or more coherent months. Several teachers have expressed that characteristics for these students are that they come from vulnerable homes or are ill. The limited offers and student absence opens up for questions concerning diversity of school programs and structures within them, since the absence can be interpreted as a lack of school programs suited for children with diagnoses. This seems problematic, as the children drop out of school, which has consequences for the child in question and the society.

A Cultural Perspective on the Meaning-Making of Children with ASD

Another perspective on how children with ASD differ from neurotypical children in relation to mutual understanding in communication and learning is how the children make sense of the surrounding world. When understanding the variety of the global diversity, we often refer to someone's culture. But the word, culture, in itself is a diverse concept. Culture as a term is described as the process of modifying material objects (Cole, 1996) into tools, symbols and meaning emerging in the relationship between active minds and their environment (Valsiner, 2014). Thus, culture is created interrelatedly. Furthermore, in order to interact and understand our environment, we as humans, create rules of interpretation through which we give meaning in a cultural context of practice, which we then act on. These actions are additionally influenced by shared negotiations and interpretations (Bruner, 1990). Thus, culture is the shared creation of rules of meaning-making, which our actions are based on, and interpreting these actions in turn, is to create meaning (Bruner, 1990). Therefore, culture and meaning-making are reciprocal processes, guiding our actions and interaction with the environment.

As our actions are guided by our meaning-making and cultural understanding, it is relevant to look at language, as this is also seen as action (Brockmeier, 2012). Cultural context surrounds us in webs of significance, which spins fabrics of meaning, we employ to interpret experience and guide action. This fabric is expressed through the use of language, and by using language we weave ourselves into the cultural world as well as the cultural world into ourselves (Brockmeier, 2012).

We thus shape our culture through language, and when communicating we translate this culture into semiotic form (Zittoun, 2012). Semiotic form refers to how

we relate signs to objects (Innis, 2012), and Pierce's triangle considers these two as reciprocally influencing each other. However, by implementing an interpreter as reading a sign and then interprets the object, in example a situation or utterance, the triangle suggests, that the meaning created for the object is in constant changing (Valsiner, 2014). This means, that as meaning-making is highly context dependent and is created in irreversible time, it is in constant ongoing development, making the meaning-making process entirely unique and thus build on context, thought processes and past experience. Therefore, actions, such as language, is situated and uniquely interpreted, and should be understood as personal cultures, reciprocally shaped by societal cultures.

If meaning-making is dependent on thought processes, then having deviating thought-processes, will result in a noticeable differing meaning-making. Children with ASD have been observed to have deviating thought patterns than their peers. These are often described as deficiencies, and are found to be patterns of tendencies, used to diagnose and categorize children into having a disorder. In this case, deficiencies or symptoms are described as qualitative pervasive abnormalities in social interactions and communicative patterns, as well as repetitive activities and interests (World Health Organization, 1994/2015), which can all be considered cognitively related, and thus deemed thought processes.

Therefore, it can be argued, that children with ASD have different meaning-making processes based on their related deficiencies or thought patterns, and as meaning-making is reciprocally intertwined with the frame of culture, then these children are engaged in shaping culture noticeably different from culture formed in their immediate society. This alternative culture then has deviating thought-processes from their neurotypical peers, indicating that their meaning-making processes are

different, and therefore might result in interpretations, utterances and expectations that should be understood from a different perspective differing from normativity and neurotypicality, thus entailing alternative meaning-making and not deficiencies.

Lastly, in conversations, intersubjectivity is key to a mutual understanding. This is exhibited in conversations, as the ability to keep a sequence going in a conversation. Intersubjectivity is the result of shared understanding as well as the structure of the interaction (Sterponi & Fasulo, 2010). When deviating from a neurotypical interpretation and meaning-making, both parties involved may suffer a loss of intersubjectivity as it might result in alternative utterances and structures in the interaction, which would then facilitate attempts to transform the utterances into a sense-making of each participant. These attempts and alterations are relevant, as they can be shedding light on how to interpret both what differs and what achieves a mutual understanding resulting in a successful intersubjectivity or the risk of losing it.

Existing Research

The above-mentioned information and wonderings led to explore what other studies have been conducted about the way children with ASD communicate. This exploration shows that only few studies have researched how children with autism communicate in a learning situation such as in classrooms. In previous work, we conducted a literature review on IQ-testing in children with ASD (Henriksen & Leer, 2017). Most of the studies identified, revealed a focus on the competencies of children with ASD, mainly the non-verbal competencies, and how these can be measured in order to classify children, according to their capacity or degree of capacity, into specific learning environments. Furthermore, focus have also been on

how specific capacities and competencies in relation to IQ-measurement can further an optimal learning outcome for children with ASD. None of the studies focused on the interrelated communication during the IQ-testing (Henriksen & Leer, 2017).

Since testing is often used to decide the institutional placement of the children with ASD, the communication during learning situations seems equally important, as this might have implications on the outcome and evaluation of the children's competencies, as previously or later measured.

Though a lot of children with diagnoses struggle to attend school, there appears to be limited research examining the learning situations where the children participate. Related to difficulties with social competences, meaning-making and impairments regarding verbal interaction, research is needed to examine the verbal interaction during learning situations in the classroom. This research can be one step away of finding intervention forms, that could foster a better learning environment for children with diagnoses.

Barker, Akaba, Brady and Thiemann-Bourque (2013) investigated the use of augmentative and alternative communication (AAC) in preschool classrooms, that is a communication method used for people with complex communication needs and developmental disabilities. The purpose of this method is to facilitate modalities to increase opportunities for communication (Barker et al., 2013). They developed two surveys to study; a) how children use ACC in preschool class settings, and b) how teacher's train, experience and perceive support while using AAC. Results show that teachers' use of prompting and asking questions was related to weaker language growth, while the use of AAC for peers enhance inputs related to stronger growth in language. In relation to classroom communication another study conducted by Strain (2017) investigated early intervention for children with ASD through use of Learning

Experiences and Alternative Program for Preschoolers and Their Parents (LEAP) in a 4-year follow-up study. Results showed that children in LEAP classes were marginally superior in relations to adaptive behavior, communication and skills in areas of cognitive functions, and socially based and academic accomplishments, even though both groups of children were doing well four years after the intervention (Strain, 2017).

In relation to communication during a learning situation a study was conducted regarding types of adult speech impacting on social competences (Irvin et al., 2015). The authors argue that adult speech can be operationalized in ways to affect social competences, while it includes behavioral management, personal/practical assistance, supporting object play and peer relations, which can provide helpful guidance for children with ASD. The aim of the study was to investigate the connection between adult speech and competent behavior in children by videotaping real-time interaction with adults in the classroom, as children with ASD experience core deficits regarding competent social behavior. Two research questions were addressed in the study; a) how many and what kind of adult speech, do children with ASD experience when attending an inclusive preschool classroom, and b) how is adult speech related to social competent behavior in children with ASD. They found that management talk had tendencies to worsening social competences, while high amounts of supporting object play talk had a positive influence on children's social competences over time (Irvin et al., 2015).

Having communicative deficits during interaction, some research has examined verbal and cognitive skills, which are relevant regarding children with ASD's communication during a learning situation. Young et al. (2016) investigated information seeking in children with ASD and children with developmental delays

(DD) in a pedagogical setting simulated by teachers. According to this research children with ASD are likely to be given tasks and instructions beyond their capacities, related to cognitive functioning and language skills, during a learning situation, where new tasks appear. When this situation occurs, it is expected of the child to seek further information through contact with others, e.g. peers and teachers. The authors argue that if children with ASD does not achieve information seeking behavior, it is difficult for them to fully participate in educational settings, e.g. classroom learning. The results showed that children with DD used information seeking behavior, when given instructions beneath their level of understanding, and this behavior was not found in the group of children with ASD. According to the authors, these findings might indicate that children with DD use the behavior to compensate for language and cognitive difficulties, while this was not found regarding the behavior children with ASD displayed (Young et al., 2016).

Additionally, Delfs et al. (2014) investigated the relation between listener training and tact emergence for children with ASD, regarding language skills. They also attempted to evaluate if collateral responding influence the emergence of bidirectional relations. They found that tact training is equally or more effective, than listener training, though further research is needed, while patterns of emergent responding varied across participants. Also, they found collateral behaviors not to be predictive of emergence, when investigating collateral responding.

Furthermore, children with ASD's joint attention skills are delayed and atypical, which can be critical, since the ability to share focus on events and objects are central for developing social communication (Kaale, Fagerland, Martinsen & Smith, 2014). Kaale et al. (2014) studied preschool-based social communication treatment for children with ASD through a 12 months follow-up. Their results

showed that children achieved significantly large improvements in joint engagement and joint attention, when baseline was compared to the 12 months follow-up.

Another study by Jarrold et al. (2013) examined social attention through a public speaking task to view its moderators and relation to learning in elementary and secondary students with high functioning autism. They found, that when having to speak simultaneously while attending to avatar peers in a virtual classroom, the participants in this study showed evidence for atypical social orientation, however when not required to regulate attention while speaking, the participants showed no evidence of atypical attention.

Engagement is another cognitive skill being documented as a core deficit when having ASD (Bruinsma et al., 2004; Mundy et al., 1990, as cited in Mucchetti, 2013). Engagement has influence on learning (Mucchetti, 2013), thus having an impact on a learning situation. Mucchetti (2013) investigated the influence of guided teacher readings activities in story comprehension and engagement, which is argued to be well suited for examining educational needs for minimal verbal children with ASD. The study showed that all participants had improved engagement and story comprehension, thus through early literacy tasks, children with ASD and minimally verbal skills can be engaged.

Lastly, studies have been conducted regarding parent's contribution and impact on the prosperity of acquiring language in relation to verbal deficits that children with ASD experience (Haebig, McDuffie & Weismera, 2013). Kashinath, Woods and Goldstein (2006) examined possible effects of parent's use of teacher strategies in daily routines when interacting with children with ASD. Their results showed positive outcomes regarding communication, and the intervention was rated as beneficial by the parents included in the study. Parallel to this a study by Haebig et

al. (2013) researched the longitudinal relations between two different forms of parental language comprehension and verbal responsiveness. They found that linguistic inputs of the parent, followed by focused attention of the child with minimalistic language skills, was beneficial, while more advanced inputs might be needed for children who are verbally fluent. Thus, linguistic learning is facilitated by different linguistic inputs, depending on the verbal communication level that the child has.

Summarizing, children with ASD have different needs when participating in educational settings than their peers. Children with ASD need modalities to increase opportunities for communication, they need adult communication to impact social competences positively, they need help to develop abilities to information seeking and joint/social attention, they need the environment to support development of adaptive behavior, cognitive functioning and to foster tact emergency. Lastly children with ASD rely on parent's contribution in relation to language acquirement. All this information leads to the conclusion, that children with ASD need an educational setting, that have knowledge about their deficits, so as to be able to support the children's development of interaction and communication.

These studies have been focusing on what children with ASD need based in their deficiencies, and there seems to be a gap in the research of the possible intentions behind the communicatively expressed actions within the learning situation. In this regard, different aspects in communication appear to have an impact on understanding the expectations and intentions during a learning situation. It relates to what Gardner (2013) describes regarding, when in a learning environment, the institutional structure of sentences is often shaped as an initiation by the teacher, followed by a response by the student and closed by an evaluating reply from the

teacher. The sequence is called initiation-response-evaluation (IRE). This is a structure practiced in almost all learning environments, such as classrooms (Gardner, 2013), and is based on the premise, that the question, the teacher asks, has an answer which is already known to the teacher. This however, is contrary to ordinary conversations, where questions asked, are based on unknown or uncertain information, for which the questioner seeks an answer to (Hayano, 2013). As such, this institutional sequence in a learning environment, makes the conversation firmly structured, and when the knowledge that the teacher seek is already known, this person asking the question thus has a specific answer in mind, of which he or she is aiming for. This on one hand, enables the teacher to control the trajectory of the conversation, maintain attention of the students, break the question in to componential parts the student struggles with and provide clues for the desired answer (Gardner, 2013). However, on the other hand, this might be inhibiting the creativity and learning process of the student, as the answer wanted from the teacher might entail a specific organization preference or syntax, leaving little or no room for alternative, but correctly applied answers. Thus, the specific expectations from the teacher might lead to a strict and rigid learning environment. Furthermore, the rigidity that therefore might be a result of the IRE sequence, can lead to weaker language growth (Barker et al., 2013) or a hamper of language development (Sterponi & Kirby, 2015). Through this understanding of learning environment and language development, it is therefore relevant to relay studies on communication in relation to children with ASD.

Sterponi, Kirby and Shankey (2015) conducted a literature review, including research using Conversation Analysis and linguistic anthropology, to rethink the characteristics about communication regarding children with ASD. The authors

imply that a new multidimensional view on communication offers a different and more complex view on how children with ASD experience, interact and interpret social relations to others (Sterponi et al. 2015). This review shows, that when understanding language as an interactional accomplishment, it provides knowledge of ways in which the child is engaged in the interaction, thus how the recipient facilitates or confines mutual understood interaction (Sterponi et al., 2015). Also, when understanding talk as an action, it provides an opportunity to understand the direction of which the child is pursuing, even when action appears atypical. Furthermore, it leads to the ability to change the view of stereotypical features, which enables an understanding of these providing a communicational meaning, so that the child does not need to suppress and replace them (Sterponi et al., 2015). The authors therefore argue, that this kind of multidimensional view provides new implications and an improved understanding of the developmental trajectory and core features of ASD.

In relation to providing a new understanding of communication, Sterponi and Kirby (2015) investigated verbal behavior in children with ASD related to prototypical behavior in language, such as pronoun avoidance/reversal, pragmatic deficits and echolalia. Children with ASD were video-recorded in home settings, and data were analyzed using Conversation Analysis (Sterponi & Kirby, 2015). They found that the use of pronoun is dependent on recipient and context, as it is modified by the frame of ways being spoken to. They also found that viewing communication as a social action provides comprehensibility to the understanding of the way children with ASD interact. In relation to this, atypical responding that seem inappropriate might have relevance to the course of action the child is trying to display (Sterponi & Kirby, 2015). Furthermore, the authors suggest, that echolalia

can be a way for the child to relate to, and experience, the other in the interaction, when having difficulty creating a relatedness to the interlocutor. So even though some talk and utterances may seem atypical, they are meaningful related to the events in the interaction (Sterponi & Kirby, 2015).

In a literature review on cooperation and communication, Fantasia, Jaegher and Fasulo (2014) presented a study by Dickerson, Stribling and Rae (2007), who investigated how children with ASD used tapping as a way to interact with teachers in a learning environment. Through conversation analysis they found, that a seemingly unrelated gesture of tapping was a means implemented when a verbal response was delayed, thus signaling ongoing engagement (Dickerson et al., 2007). Fantasia et al. (2014) argues that in interaction the cooperation of an autistic child is observable in non-verbal activities, but on the premises that the interaction and autism should be considered from a different perspective, and not that of their deficiencies. The perspective should be attempting to understand the children's spontaneous interactional behavior in studies of verbal behavior. Both Fantasia et al. (2014) and Sterponi et al. (2015) thus argue, that future studies should not focus the starting point on the children's deficiencies, but rather explore the subtle variations in the communication.

Further research has been conducted by Sterponi and Fasulo (2010), analyzing speech exchanges between a child with autism, and the adults around him in the home setting. They found a connection of progressivity and intersubjectivity, using conversation analysis. While the child was not able to provide many original contributions to the conversations, he was able to maintain progressivity by repeating the interlocutor's utterances (Sterponi & Fasulo, 2010). This sometimes resulted in a loss of intersubjectivity, as the turns addressed to him might change pragmatic

trajectories. However, when the interlocutors engaged in the elaborating replies, the child was able to show humor and abstract knowledge projected in all participants. It was also found, that when the conversational frame was oriented towards sharing instead of controlling, the child and mother were able to incorporate narratives and joint remembering (Sterponi & Fasulo, 2010). This indicates that the control in rigid orientation in conversations with this child might result in the loss of intersubjectivity, if there is no room for elaborations, both in response or narratives oriented towards the child. This supports the findings from Sterponi and Kirby (2015), as the framing of personal references also indicates control instead of sharing, thus rendering the children to a progressivity of the utterances of the interlocutor.

Additionally, Ochs and Solomon (2004) introduce a study from 2004 by Tamar Kremer-Sadlik, who examines the perspective taking and joint-attention in children with ASD, when they engage with family members during question-answer sequences. Results showed that the majority of the time, the children were able to understand the communicative intentions of their interlocutors and answer accordingly as expected by the interlocutors (Ochs & Solomon, 2004). This suggests that children with ASD are indeed able to engage in a learning situation, however, they might implement alternative verbal or non-verbal activities in order to show their engagement.

The change of perspective is supported by Taylor (2011), who refers to the relevance of interpretation of expectations in communication during educational interaction. Children with ASD experience trouble interpreting talk and expectations of others (Taylor, 2011), and it is therefore relevant in relation to a learning situation. According to Taylor it is possible to change attitudes regarding what expectations are

present in learning environments by acknowledging attitudinal barriers and by creating more awareness of the disabilities through relevant literature, which would create better suited learning environments for children with ASD (Taylor, 2011).

These studies show, that children with ASD are able to understand communicative intentions, thus being able to participate in a learning situation, though they have alternative ways of showing their engagement. Furthermore, they suggest that even though interaction might be atypical, it serves a related and specific purpose in the interaction, that are meaningful to related events and context.

Rethinking the communication regarding children with ASD, can therefore provide a new knowledge about the way the child is engaged in communication. It is an opportunity to stop focusing on deficiencies children with ASD might have during interaction and change the view on stereotypical communicative behavior. In classroom settings it provides an opportunity to change attitudes regarding expectations in learning environments, as it might create better suited learning environments for children with ASD. The included studies also indicate, that the communication of children with diagnoses is a relevant topic to examine in relation to learning. Among the diagnoses, the examination of children with ASD in particular, is imperative due to their difficulties as well as the argumentation, that children with ASD holds a different meaning making process than neurotypical children, and the expectations insinuated in the school programs. The perspective of conversation analysis entails verbal interaction as action, and therefore this method withholds a way to examine what happens during the conversation between a child with ASD and interlocutors. This kind of analysis can provide a new perspective regarding an understanding of children with autism, which can relate to displayed problematics and provide a starting point for fostering potential solutions. As

presented by 21Søndag many children with diagnoses are not attending school.

Therefore, it is rather pressing to research the topic of communication and learning in Denmark. Furthermore, as the ABA approach often frames a one-on-one learning situation targeting problematics experienced with children with ASD, a research setting is avoidable, as the learning often is a part of a home setting with a parent acting as teacher. This setting is therefore relevant in relation to studying communication in a learning situation, as family interaction has presumably been practiced since birth, which might provide a more comprehensive perspective on communicative elements, than that of a school setting. This leads to the research question:

How is mutual understanding achieved through interaction in learning situations with a child with ASD? – The case of a Danish six-year-old boy and his mother.

Method

The methodological approach used in this study is Conversation Analysis (CA), which has been developed within the field of Ethnomethodology. Thus, the following section includes a methodological description of CA and how present study was conducted.

Ethnomethodology

Ethnomethodology is an area within sociology (Maynard & Weathersbee, 2007), which studies how individuals use different methods to interpret and produce social interaction (Sullivan & Forrester, in press). The focus of this approach is to

procure rational analysis of how individuals make sense of his or her everyday world, and interactions within it, by the use of structures, strategies and procedures (Sullivan & Forrester, in press). These methods are accessible in the concrete activities of people, and therefore available for scientific analysis (Maynard & Weathersbee, 2007). Ethnomethodology originated from the work of Harold Garfinkel, an American sociologist (Maynard & Weathersbee, 2007). Garfinkel understood everyday activities of individuals as orderly, and that the methods used in these are produced to look normal and ordinary to the surrounding environment (Sullivan & Forrester, in press).

In 1959 Garfinkel met Harvey Sacks, and due to this and later encounters they influenced each other (Maynard & Weathersbee, 2007). Through this and other inspiration of ethnomethodology, Sacks started developing CA.

Theory of CA

Influenced by ethnomethodology, CA originated within the field of research from a concern revolving the study of naturalistic everyday interaction of individuals (Sullivan & Forrester, in press). This way of studying conversation was an opportunity to examine what is being said and how people speak (Sullivan & Forrester, in press).

Sacks (1935-1975), who is originally trained in law, started to develop CA (Drew, 2008). He performed investigations for the Center for Scientific Study of Suicide, where counselling telephone calls were recorded to get a better understanding of problems connected to suicide and to make counselling calls more efficient (Drew, 2008). From these investigations CA emerged. Through the investigations Sacks began to study structures behind conversation, such as turn-

taking, sequential patterns and management of activities within conversation (Drew, 2008). Sacks derived talk as an action and not communication, due to the fact of talk being examined as an object having its own rights and that people actually do things while talking (Drew, 2008).

CA, as a method, entails how people engage in actions during verbal interaction (Drew, 2008). CA research is based on observation of naturalistic data, where actual behavior (both verbal and non-verbal) is studied through audio and video recordings. The goal is to document and capture the character of interaction to examine how people understand and respond to each other during verbal interaction (Drew, 2008). The methodology is based on analyzing sequences in talk, where actions are produced and embedded, which makes it possible to investigate how people accomplish social interaction (Drew, 2008). It is a way to unveil how people come to understand each other's actions during interaction as well as how they create turns at talk, so that they match with prior turns and make it possible to uncover socially organized practices, that people use to accomplish mutual understanding and also for the use of managing social activities (Drew, 2008).

Rationale for choice of method.

CA as a method makes it possible to uncover how people come to understand each other's actions during interaction (Drew, 2008). This is relevant in every type of communication, but particularly when researching children with autism, since children with autism are socially challenged, which in turn might appear to have an impact in communication, and through this, a learning situation. Also, CA makes it possible to analyze any difficulties arising in a learning situation, such as to interpret socially organized practices, intentions and expectations of others, which can make

challenging for children with ASD to understand others, and to be understood while communicating.

Furthermore, CA makes it possible to uncover socially organized practices, that people use to accomplish mutual understanding and to manage social activities (Drew, 2008). CA is able to reveal how children with ASD use socially organized practices to manage the social activities occurring in a learning situation, and how the children use these practices to accomplish an understanding of others participating in this particular situation. Adjacency pairs, a component of CA, are among other things about expectations occurring while interacting. When one participant performs an action, it is expected what the next performance holds (Drew, 2008). If the child struggles with understanding these expectations, trouble can occur during the interaction, making it difficult to obtain any progressivity, thus making it difficult to obtain knowledge and achieve learning. CA is therefore a way to look at different fundamental structures of verbal interaction and can shed a light on how children with autism learn with the best outcome.

In closing, CA is a method with multiple tools, that make it possible to obtain knowledge, regarding the verbal interaction occurring in a learning situation, and which fundamental structures that are essential when children with autism are included.

Sampling Procedures

We discussed the framework of our data selection and decided to include two cases from the supervisory teams at CAA. A case was defined as a neurotypical mother or father and their child with autism, engaged in learning related interaction, participating in the ABA program at CAA. Our focus was on the uniqueness of the

individual cases, seeing that all families interact and communicate differently, on the premises of the dynamic relation of their personal cultures (Valsiner, 2014). Thus, this kind of data provides a good basis for working with a CA approach, researching children with ASD and mutual understanding achieved in a learning situation, while it is video material including learning related situations.

Demographically, the age of the children in question should be the age of around a minimum of five years old and maximum 16 years old, in order to secure a minimum of language skills, as well as an upper age limit of the municipal school age. We also wanted the participating children to be enrolled in neurotypical school settings, because this would make it possible to relate the research to problems that are related to inclusive school settings. We preferred the child to have only one clinical diagnosis of autism, so as to acquire a cleaner analysis of the interaction of a child with autism, however a more realistic presentation would have included several comorbid diagnoses, therefore this requirement was kept rather loose.

Since the rearing of children is a sensitive topic for most families, we could not presume to be able to get unlimited amounts of videos. Being familiar with the work conducted at the CAA, we knew that the families make video recordings of the training, which would provide naturalistic videos, that entails learning situations of cognitive training, namely ABA. Thus, we decided to contact the center in order to ask for help to bring our research proposal to the families participating in their program. We decided to use these already recorded home videos from the families if possible, since gave us a more authentic view of the particular learning situations in the home as well as the frames in which most ABA practicing families work.

Prior to collecting the data, we reflected on how to represent the study to the participants, as well as how to interact with them, following the suggestions of

Brinkmann (2012). As we contacted the families through the CAA and the already attached supervisor to the respective families, we wrote a description of the study for the potential participating families (see Appendix A for complete description). The description of our study included a description of the purpose of the study, the methodology, the intended target group, safety precautions regarding anonymity, and our backgrounds.

Because our study involved sensitive data of a diagnosed children, we needed to know about regulations handling the video data (Langdridge, 2007). We contacted the Danish Data Supervision in order to confirm the safety regulations for data safety. Furthermore, we contacted the Northern Jutland's Scientific Ethics Committee to inquire whether our study needed to be reported to this committee, who responded, that the study did not need to be reported as a scientific health research project. The guidelines ensured an optimal and suitable safe and ethical handling of our videos and data.

Three families out of five approached, volunteered to participate, however one was located too far away, and we were therefore not able to gather the videos within the safety regulations provided by the Danish Data Supervision. In order to follow the safety regulations, we send encryptable USB sticks to CAA, and the supervisors then brought the USB sticks to the two remaining families. They then transferred their videos to the sticks and signed a consent form (see Appendix B for a blank consent form), as well as filled out four describing questions. The questions are displayed in Table 1.

Table 1

Descriptive Information

Age of child
Diagnosis
If possible which school and what kind of school
Remarks on atypical development, e.g. delayed language onset

The questions aimed at focusing the study on the communication expressed by a child with autism, so as to refer back to the development of communicative competencies as well as a possible impact of school placement. Once uploaded to the USB sticks, we went ourselves to get the data at the Center. Unfortunately, the families were not able to encrypt the USB stick, due to the model of the computers, which left this assignment to us. However, as a result of the encryption of the USB sticks withholding our data we lost the data from one of the families. We were then left with only one participating family, however because of the amount of data and limitations, this data provided enough information to conduct the study.

When meeting the mother of the case at hand, we tried to answer every and all questions, as well as offer our contact information, in case any questions might arise later. The intention was to be as transparent as possible, since we are aware of the sensitivity related to home videos of parents and children. Additionally, since the videos were pre-recorded it was not necessary to withhold any detail, that could influence the home procedure of teaching the child and render them biased toward the opinion of the researcher or the goal of the study. Furthermore, the mother was informed that should she want to withdraw from the study, she could do so at any time during the length of the study. We also informed her, that the intention of the

study, was not to criticize her rearing, but rather an exploration of the tendencies in the unique interaction and context.

As the videos were pre-recorded for home use and for supervisory purposes within frames of home settings, they were naturalistic and would exist regardless of our study, and therefore they were considered suitable for a qualitative study (Brinkmann, 2012). We thus explored the communication between a mother and a child in a home setting, which required ethical consideration of the invasion of privacy (Brinkmann, 2012; Langdridge, 2007). We kept consideration of the ethics behind how to portrait this communication, if the family asked to see the project as well as the publication of the study (Brinkmann, 2012). In this regard, we considered if we would be able to remain true to our study, while keeping in mind that the mother might be affected by our portrait of her interaction with her child, should she choose to read it. However ethically speaking, as the focus of this study was to explore the communicative interaction between the mother and child, and therefore not present the result as a critique of deficiencies or rearing, but rather an exploration of the tendencies in the unique communication and context, we argue that we can remain true to the study, without affecting the mother.

Case description.

Our sample includes a six-year-old boy, whom we have given the pseudonym Carl, in order to keep his identity anonymized. He was clinically diagnosed with childhood autism at the age of three. This autism diagnosis is a pervasive developmental disorder that manifests before the age of three years old by presence of impaired or/and abnormal development. This is his primary and only diagnosis, and he is additionally categorized as high functioning based on a previous

psychological evaluation. Gathered from the descriptive information in Table 1, comments about specific characteristics on the diagnosis of Carl was, that he early on had a rigid way of thinking, language problems delayed by one to one and a half year and his perception of time was lacking. Carl was attending kindergarten when the videos were recorded but was to start in a neurotypical school the following summer, as he is. The mother performed different exercises with Carl at home, which were often specific tasks designed to develop or enhance basic social comprehension and language skills. These tasks and the respective goals are elaborated in the result section.

Data processing.

First, we gave each video a number, to make referring easier later, and noted the given titles by the mother to each video, which referred to the purpose of the videos. The 14 videos received, amounted to a total time of 59 minutes and 16 seconds. They entailed learning situations, where the child was given and instructed in different tasks. The tasks each targeted various executive skills, such as categorizing, working memory, shift between detailed and overview perspective, and storytelling. In most of the videos the mother, which we gave the pseudonym, Mom, and Carl were positioned at a table either beside or across from each other. The length of the different recordings varied between approximately one minute and eighteen minutes recording time. The videos were recorded across a span of a year and a half, starting when the child was five years and three months old.

The videos showed mostly just Carl. Mom was positioned behind or at the side of the camera. Four of the videos included Carl's little sister and in seven of the videos the camera position was handheld. However, in the majority of the videos the

camera angle framed Carl and in a few cases Mom's hands and half her face.

Therefore, the perspective of Mom during the conversation, is exhibited through the utterances and the pointing of her hands.

Method of Analysis

The analytical components of CA do not have one distinct method of procedure. We implemented procedural theory from three different sources, namely *The Handbook of Conversation Analysis* by Sidnell & Stivers (2013), *Applied Conversation Analysis* by Lester and O'Reilly (in press) and *Qualitative Psychology* by Smith (2008). These different sources varied in small ways, mostly in the extent of symbols portrayed, but also the initial procedure of organizing and approaching the videos disposed for analysis. We therefore implemented the procedures, which we estimated as best suited for this study and the perspective it carried. The analytic CA components were all implemented during the result section. Additionally, we have taken the necessary steps, as provided by the Danish Data Supervision, in order to ensure safety and anonymity for the participants, so as to not expose the participants and their privacy. In this sense we have given the participants pseudonyms, and photographs from the videos have been rendered into cartoon portraits.

CA develops through identifying a phenomenon, collecting this phenomenon from different places in the material and distinguishing sequential patterns that are associated with the phenomenon (Drew, 2008). To implement this method, there are basic principles of CA, which are tools for carrying out the analysis (Lester & O'Reilly, in press). These tools are considered the fundamental structures within verbal interaction and will be described in the following.

Viewings of videos.

We watched the videos multiple times and discussed what sequential patterns were consistent and relevant to achieve mutual understanding when viewing the interaction between Carl and Mom. Additionally, we watched all the videos separately one by one to avoid any mutual influence and to maintain a proper consensus validity, when we in the process compared notes and codes in order to confirm or dismiss if the same behaviors were observed from both researchers. From this, eight different themes were established. Because of time restrictions we decided to settle on three themes, which we deemed the most relevant to our research question. These are as follows:

Table 2

Themes Selected from Viewing Videos

Theme	Categorization
Attention deficiencies	Categorized as such, when Carl showed a seemingly lack of attention on the task at hand, by looking away, not replying, fiddling with toys or otherwise seemed preoccupied.
Miscommunications	Categorized as such, when Carl asked wondering questions seemingly out of context from the task at hand or when he provided an explanation of a task solution, not immediately recognized as such.
Repetitive gestures	Categorized as such, when Carl started tapping or flicking his hands repetitively and seemingly unrelated to the conversation.

The three chosen themes were relevant in relation to discussing communication during learning situations, because concentration and repeated behavior, such as hand flipping, are included in the diagnostic descriptive features of autism. Miscommunication is relevant in order to gain perspective and negotiation during inter-relational communication. The themes therefore showed a broad and autism related perspective to why it could be difficult for children with ASD to communicate with others, and difficult for others to understand the children. Thus, these themes could also be related to communication with peers and teachers, while the children interact and learn in school.

We then went systematically through the videos again, while focusing on the three themes. We noted the theme, the number of the video, the specific time sequence, the time amount of each sequence, and a few notes on what is seen. This left us with video material of 31 minutes and 26 seconds data.

Transcriptions.

First, the transcriptions were anonymized, and therefore the names were changed. Besides Carl, other participants are represented in the videos, yet Carl was mostly interacting with Mom. We have chosen to represent Carl's little sister with the pseudonym, Rita, as she was referred to by name by Carl and Mom.

Secondly, in order for the analysis to be transparent every decision about what to include and what not to include in the transcription were considered and described. To make the analysis obtainable the transcriptions of the videos were as detailed as possible, to visualize what was being said, since this was relevant to the analysis of interaction (Drew, 2008). For this purpose, we used the transcription system of CA, which contained a variety of different symbols and has been referred

to as the Jefferson System (Lester & O'Reilly, in press). The aim of this system was to display as much of the vocal, multimodal and verbal details as the data contained (Lester & O'Reilly, in press). This made it possible to show pacing, intonation, emphasis in talk, overlapping talk, pitch changes and so on, providing a clear image of *how* things were said.

We did three transcriptions in order to achieve a maximum amount of details within the limits of this study, since the Jefferson method requires a comprehensive amount of fine print. The first transcription contained basic drafts of what was being said in the verbal interaction between Mom and Carl. The second transcription included using the Jefferson method and counts of pauses within the speech. The third transcription were a refining of the transcriptions and examining the prosody of the features. Below, the three levels of transcription are elaborated.

First transcription.

The first transcription was a basic transcription, that worked like a draft indicating, what was being said in the videos, in order to gain an overview of the video sections chosen. Focus for this transcription were to write down, what was being said and the general interaction exhibited. The basic drafts therefore included gestures, so as to represent repetitive tapping; words, to understand what was being said; laughter, long pauses, overlapping speech and active noising, to identify attention deficits or interruptions. In this way, the chosen elements in the basic transcriptions, made the interactional patterns more transparent in the overviews. Talk was represented as it was produced, and not as it should have been or was intended to be (Hepburn & Bolden, 2013). This meant, that the sounding dialect of this particular region of Denmark caused some of the words to be portrayed with

retractions and missing endings. Each line was numbered for easy reference to specific points during analysis (Hepburn & Bolden, 2013).

The majority of the videos only included Carl in the picture. Because the lack of perspective, seeing exactly what was going on between parent and child, were compromised, transcriptions of eye gaze and bodily contact are therefore not described in particular. This lack of transcription was not seen as compromising the analysis, because of the chosen themes, which was based on the observation of Carl. The topics were overall relevant for what observed in the communication and interaction between the participants.

Second transcription.

The second transcription was used to both review the material again, but also to make a more detailed transcription of the data. This transcription included counting breaks and pauses, in what was being said, and viewing multimodal gestures. The multimodal gestures were described and composed with pauses, words, or stands on their own depending on when they occurred. These different compositions were helpful when analyzing the meaning of actions in verbal interaction. These transcriptions were done with the Jefferson method, which therefore included pitches, intonation, stress, and speed of speech. The symbols included in the transcription were chosen on the premise of what occurred in viewings of the videos, but also possible within the time constrictions for this study. This meant that the symbols chosen, were deemed more common, as well as easier to detect with limited research resources at our disposal.

Third transcription.

The third transcription was a refinery of the second transcription as well as the final examination of the prosody features. In these, we reexamined already noted pitch and intonation, in order to reassure that these were correctly noted earlier. Additionally, we noted any further instances of pitch and intonation previously not noted. We made the last corrections for the fine print and aligned the related overlapping clams above or beneath each other. Furthermore, when a proper turn was not taken, or nonverbal gestures were exhibited in place of a turn, these were marked by transcribing the gestures after the name of the turn.

The Jefferson method is based on the English language, which differs from the Danish language in multiple ways. The Danish language sound different in pronunciation, where volume and intonation rise and falls a lot when speaking. Related to this, it became clear that we as researchers having different dialects interrelated all together, focused on different prosodic peaks. In order to avoid such bias and keep a proper consensus validity of the peaks in the transcripts, we focused on the intonation and pitch, where it was unquestionably clear and seemingly unrelated to the singing of the dialect. The peaks chosen were distinctively clear, as we chose to implement symbols only, when the two authors coding was similar.

We watched the videos multiple times before working on the transcriptions. We therefore became very familiar with the data and in what way Carl and Mom verbally interact together. On this ground we elected the symbols most relevant for transcribing the collected data. Only a few symbols were discarded, since they would not be relevant, or would be described when using another symbol.

The following table shows the meaning and use of the symbols included in this study. These are derived from different approaches to using the Jefferson

method, where we as earlier mentioned picked out the ones suited for our transcriptions. Following the selected symbols will be a description of how they are used.

Table 3

Transcription Symbols for Timing and Sequential Position

Symbol	Description
[]	Overlapping talk or activity. Is aligned above each other from beginning to end. When activity overlaps with already overlapping talk, an extra pair of clams will surround this talk. It then pairs up with both the surrounded overlapping talk as well as the overlapping talk of the next turn.
=	Latching. Marks the lack of discernible silence. When between two turns, it is marked at the start of next turn.
(0.x)	Silence relative to speech rhythm. Can be determined by adapting to speech rhythm and counting “none one thousand, one one thousand etc”. Ex. if speech is broken after “none” then (0.2). If it is broken after “none one” then (0.5). If after “none one thou-” then (0.7). If after “none one thousand” then (1.0)
(.)	Micropause. Less than two tenth of a second.
.	Strongly/clearly falling intonation (the fall of voice when speaking). Positioned at the start, middle or end of words, depending on where the rising intonation appears.

?	Strongly/clearly rising intonation (the rise of voice when speaking). Positioned at the start and end of words, depending on where the rising intonation appears.
Why	Stress. Underlining. Used to indicate stress like increased amplitude and/or higher pitch. Not entailing mild natural stress on syllables.
WHY	Shouting. Indicated by upper-case letters
° °	Soft/quiet voice. Degree signs for soft or quiet voice.
oo oo	Whisper or mouthing
:	Sound stretching. Prolonging the sound just preceding the colon. The more colons, the longer stretching.
↑ or	Sharper rise in pitch. When across a string of words, the arrows are put
↑ ↑	on each side of the string.
↓ or	Sharper fall in pitch. When across a string of words, the arrows are put
↓ ↓	on each side of the string.
↑↑ or ↓↓	Particularly sharp pitch resets
> <	rushed speech. Often marking superfluous talk.
< >	slowed speech. Often marking emphasis
-	Cut-off words. Marked by a hyphen at the cut-off point. Marking self-repair
£ £	Smiley voice or suppressed laughter.
~ ~ or	Tremulous voice. Signals upset.
~	
(())	Transcriptionists description of events
()	Possible hearing. Used when the transcriptionist is uncertain about a hearing.

h	Aspiration. The greater the number of h-es, the longer the aspiration. Often conveying a range of emotions like extreme upset or hysteria (crying, panting or sobbing). Often combined with inhalation.
.h	Inhalation. Marked by a period before the letter. E.g. .hh The greater the number of h-es, the longer the inhalation. Often conveying a range of emotions like extreme upset or hysteria (crying, panting or sobbing). Often combined with aspiration.
Laughter	Indicated by a variety of consonants within an aspiration. E.g. huh/hah/heh/hih. Sometimes also containing g's. May be part of words or may be plosive (stop consonant) which is indicated by parentheses - e.g. "thi(h)nk".

(Lester & O'Reilly, in press; Hepburn & Bolden, 2013)

In the analysis the parts of transcriptions included are marked by transcription title in parenthesis, e.g. (T1), which in this example refers to Transcription 1. The part of the transcription displayed appears in ongoing, numbered excerpts, ex. Excerpt 1. When referenced in the analysis, it was indicated what lines and excerpts were referred to, e.g. Excerpt 1, l. 4-10. Every excerpt has a descriptive title of what the excerpt entails.

As the videos were collected from a Danish family, the spoken language is therefore Danish. In order to remain authentic to our study, the transcriptions have therefore been kept in Danish, but included examples in the paper have been translated into English. Thus, the translations only contain the words spoken and rough paralinguistic features such as gestures, coughs, or laughter. Furthermore, the endurance to the Danish transcriptions rendered the transcriptions as sensitive as

possible to the detail and nuance of the material (Hepburn & Bolden, 2013).

However, when translating into English, we kept the translation as close as possible to the Danish syntax, in order to promote this sensitivity as much as possible, within the established frames. This was structured with the first line written in Danish and the following line was the translation into English. The translation did not include Jefferson symbols, since these would not be placed and used in the same way in the English language. However, the translation was a direct translation, in order to understand the prosodic variations on the specific words, but since syntax was not the same in both languages, the syntax of the English sentences might seem incorrect in regard to understanding the meaning of the utterance. However, if the syntax was out of order in the Danish language, it was noted in the analysis. Provided in Figure 1 is an example of a translation, exhibited further down in Excerpt 1 in the results section.

15 Carl: (0.3) Øh (1.0) hvad ka man så [te:gn me:d]
(0.3) Uh (1.0) what can one then draw with

Figure 1. Example of translation of transcription.

Terms of conversation analysis.

In line with the general procedures of CA, we particularly looked at the following features of talk-in-interaction. *Sequence organization* entails, that the current action should be responsive to the prior turn in the conversation. The conversation is therefore divided into contingent sequences, where one turn leads to the next turn. These are used by interlocutors to handle verbal interaction (Lester & O'Reilly, in press).

Turn-design is how people perform a specific action by constructing their turns within sequences of verbal interaction (Lester & O'Reilly, in press). This includes the placement of the turn in a sequence, what sort of action, the person speaking, is performing and lastly, who the turn is being addressed to in the conversation (Drew, 2013). Associated with turn-design is *the principle of contiguity*, that relates to the association between turns; if the current turn fits the prior turn, which relates to the understanding between the interlocutors, when they talk (Lester & O'Reilly, in press). This is in terms of CA, considered as *intersubjectivity*, which refers to the idea, that meanings are shared and co-constructed through the interaction between interlocutors (Lester & O'Reilly, in press). Furthermore, *next turn proof procedure* is related to turn-design, which concerns the understanding of the prior turn and through this understanding making it possible to construct a relevant next turn (Sidnell, 2013).

Within verbal interaction lies difficulties in determining, when the current turn is ended by the person, who is speaking (Lester & O'Reilly, in press). The *turn construction unit* (TCU) is a segment of talk, that completes a turn. These can contain a whole sentence, a single word or clauses (Lester & O'Reilly, in press). The TCU leads to a *transition relevant place* (TRP), which refers to the point in the interaction, when the speaker finishes his/her turn, and makes room for the next person to take a turn (Lester & O'Reilly, in press).

CA focuses on turn-taking within verbal interaction. Turn taking is normative and includes rules for, when to speak, and when not to speak, and indicates a speaking order for the participants in the interaction (Lester & O'Reilly, in press). There are three ways, which indicates a new turn. First, the person speaking selects who speaks next, e.g. by saying their name. Secondly, the recipient makes a self-

selection to speak the next turn, and thirdly, if more people want the next turn and start to speak, the one, who spoke first, gets the turn. The latter is called *turn-initial* (Lester & O'Reilly, in press). When shifting turns, overlapping may occur, which is when two speakers speak at the same time, such as in turn-initial. *Turn-terminal* is a term for when the self-selected next speaker slightly interrupts the speaker's turn before the completion, and *mid-turn* overlapping suggests, that an interlocutor finds the speaker's content lacking or otherwise unfulfilling (Lester & O'Reilly, in press).

In organization and design of turns, a characteristic feature is, that talk is organized in *adjacency pairs*. This refers to the speaker making an utterance, that the recipient in the next turn responds to (Lester & O'Reilly, in press). These have multiple characteristics; they contain two turns and they are spoken by two different people; they are closely related (one before the other); they are ordered, so the first part precedes the second part; and lastly, the pairs are of specific types, so that a particular first part are preceded by a suited second part (Lester & O'Reilly, in press).

A *practice* is described as a component of the turn, which has a distinctive character, and includes specific locations, which refers to the placement in the turn, e.g. in front. A practice has a unique role in proportion to the meaning of the turn, which is implemented by the turn (Sidnell, 2013).

Repair is an attempt to handle difficulties during a conversation. These difficulties can be of different characteristics but are all considered as hampering the conversation (Lester & O'Reilly, in press). Repair is therefore integrated to maintain progressivity during verbal interaction (Lester & O'Reilly, in press). There are four different types of repair:

- Self-initiated repair: this happens when the repair is initiated and carried out by the same person who created the trouble.
- Other-initiated self-repair: this happens when the repair is initiated by the recipient, but the repair is still carried out by the person who created the trouble.
- Self-initiated other-repair: this happens when the person, who created the trouble, initiate the repair and requests the recipient to repair.
- Other-initiated other-repair: this happens, when the recipient initiates and carries out the repair (Lester & O'Reilly, in press).

Additionally, these repairs are categorized into a variety of components, some of which have significance for this study, and will therefore be mentioned. A *frame* is a repair that by repeating part of the trouble-source, frames the repair solution. *Silences* and *delays* are repairs that helps the speaker maintain a turn, by indicating a willingness to resume the turn. These are often displayed as “uhm” or “uh”. A repair preface often occurs at a TRP, and act as a preface to a repair (Lester & O'Reilly, in press). A parenthesizing repair, is an aside turn to check something out with the recipient. Lastly, self-talk is when the speaker pauses and begins orienting their talk towards themselves introspectively (Kitzinger, 2013; Lester & O'Reilly, in press).

Finally, when participating in verbal interaction, participants tend to follow a variety of implicit and explicit principles. This is referred to as *preference organization*, and builds on the assumption, that people respond to prior turns based on what is preferred (Lester & O'Reilly, in press). There are two different kinds of preference organization. The first is *the general rule*, which refers to, when one of the participants have special information about something distinctive and relevant to the interlocutor, and therefore mentions it (Lester & O'Reilly, in press). The second

is *type R* which refers to, when a certain context indicates a preferred action, and if not present this would be noticeable.

Criteria of validity applied to the study.

Before continuing with the result section, it is worth mentioning a few steps towards validating the study. Firstly, in order to improve our skills and gain knowledge of this specific analytical approach, we participated in a data session with eight experienced scientists, who researched different areas of communication by means of conversation validity. In these data sessions, the goal was to gain perspective on the data presented, by having other researchers look through a small amount of preselected data and analysis and discuss their viewings interrelatedly. By learning from others and improving our skills, we indirectly contributed to the validity of the study. However, to actually further the validity of the study, we aimed for a consensus validation of our findings, thus seeking out an interrater comparison to achieve this (Yardley, 2008).

Furthermore, we discussed the analysis with each other, and we were able to hold a few smaller data sessions with our supervisor, who was interested in a similar research area of communication and autism using CA. For this study, a few excerpts of the videos and the respective transcripts were viewed, and then discussed analytically. Our supervisor was presented with our analysis, which in turn were validated by her, as she confirmed seeing the sense in the analytic outcome of practices and repairs.

The use of the data sessions as validating value, are exhibited through the discussions and comments, as they portrait the perspective of other researchers, which can then be compared to the analysis done in the study, thus gaining insight

into our views as researchers of this study, but also gaining perspective on other analytic views. In this sense, the coding and analysis were interraterly compared. This is an important consensus validation, as the method of CA are a subject of critique of lacking objectivity (Yardley, 2008).

Appendix C contains the full in-depth transcriptions produced for this study, in order for other scientists to be able to inspect the data and analysis. In order to carry out the analysis, a few considerations of the settings and structure of a learning situation are presented below in the next section.

Results

Analysis of a Learning Situation

A learning situation is an institutional setting based on the structure of the interaction. It is a system involving both turn allocation and pre-allocation (Lester & O'Reilly, in press). The sequences and adjacency pairs are structured around question and replies with an end goal of developing knowledge and learning new skills. In this sense, the turn designs differ from ordinary conversation. Turn taking and turn design are thus influenced by the institutional structure of the interaction, which often is set as an adjacency pair involving direction and following or as an adjacency pair involving question and answer. This is because the mother, as both a mother and a teacher, has the power of setting environmental frames as well as interactional frames aiming for the optimal learning outcome for Carl as a student. This kind of setting and communication have a pedagogical frame that Mom exhibits, and Carl adjust his answers to. They are both communicating their turns and responses in a way, that forms the setting into a beneficial setting for learning, which is expected during a learning situation. As argued by Harré (2012), in the

student/teacher positioning, there is a storyline positioning the teacher as one with the duty to teach and the student as having the rights to learn, meaning that power given to Mom should be with Carl's best interest of learning outcome in mind, as it is her duty as a teacher. In this sense, a learning situation is framed as settings fostering new information processing and gaining competence or new skills.

Additionally, part of the learning setting in the videos presented is a camera, either handheld or stationary positioned, which might influence the learning situation. However, as Carl does not interact with the camera nor orient towards it, it is arguably not an invasive object in the interaction, making it an integrated part of the setting, thus rendering the situation natural in spite of the presence of the camera (Forrester, 2011). Evidence of this is found in the opposite, when Carl is able to see himself in the camera in two of the videos. The recording smartphone then becomes an interactive object, similar to a mirror and treated as having a presence (Forrester, 2011).

The radical change in orientation and behavior, when Carl is able to see himself on the smartphone screen, stands in sharp contrast to when he is not. Therefore, the camera is arguably not invasive nor a point of orientation during the learning situations, apart from the few instances of mirroring. It thus stands to reason that the perspective of the camera, when focusing on Carl, is a vantage point of Mom's perspective during the conversation, as she is the one determining the focus of the camera, thus keeping herself behind or at the side of the camera, out of focus. Thus, the present study has not discussed further, the position and orientation of the camera, in the settings of a learning situation.

General Fundamental Structures of the Interaction

In the following paragraph general fundamental structures of Carl and Mom's communication will be analyzed in relation to what is relevant during a learning situation. Topics discussed includes preference organization, next turn proof procedure, practices and repairs implemented by Carl. These structures are all relevant since they are all included in patterns throughout the sequences of turns in communication, and they can be related to having an influence towards if and how learning occurs during a learning situation. Focal points will be marked by an arrow in the excerpts.

The preference organization of Mom.

An imperative part of the analysis due to the environment of the learning situation is the structure of *preference organization*. This structure concerns people tending to respond based on what is preferred from the recipient's prior turns. In a learning situation *type R of preference organization* is present, since it relates to a preferred specific action, which is to answer questions in order to promote learning (Lester & O'Reilly, in press). In the transcripts Mom has expectations that are both implicit and explicit expressed during the interaction. For the interaction not to be disturbed by trouble Carl has to know and read what is preferred by Mom, while performing the task to achieve a good verbal interaction and to accomplish learning. It is often noted when analyzing, that dispreferred actions begin with markers such as *Øh (Eh)* or *Nå (Well)*, and tend to follow a delay, whereas preferred actions are without delays, but are delivered quickly (Lester & O'Reilly, in press).

In some cases, Mom is rigid in her preference organization, causing her to miss, when Carl answers her questions correctly, yet she indicates to him that they

are incorrect. This often results in Carl losing interest or understanding of the intersubjectivity in the action she wants to mediate to him.

Consider the excerpt below. In this, Mom and Carl are positioned on the same side of a table, with a paper in front of them, with drawn pictures on it (See Figure 2 for a presentation of the task). They are solving a picture task, where Carl should identify, what is wrong in the picture. The skill to gain from this, is the ability to maintain an overview, by zooming out and focusing on the whole of the picture. This is based on the tendency for children with autism, to over focus on details, thus missing the overview of the situation or in this case, the pictured characters.

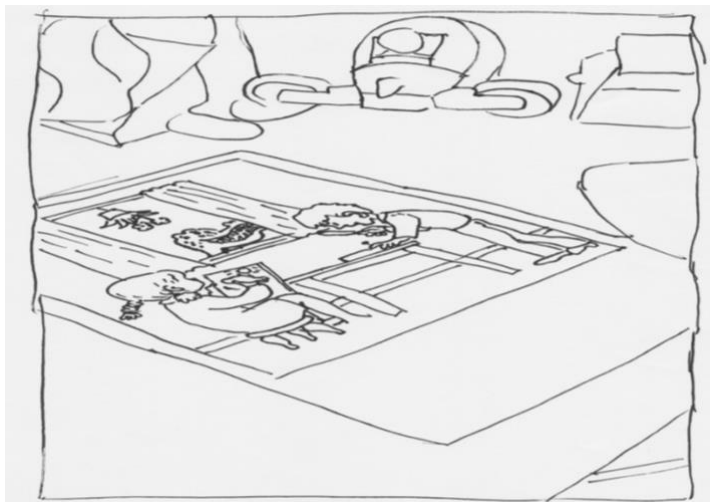


Figure 2. The picture task. The task of identifying what is wrong and how to make it right. This figure entails a girl drawing with a fish, a crocodile in the window, a flower hanging upside down and a boy hammering a nail with a knife.

Excerpt 1 (T20)

Carl and Mom are Looking at Printed Cartoons of a Girl Drawing with a Fish

- 14 Mor: (0.3) °Hva' ka' man så teg:n mæ°
 (0.3) What can one then draw with
- 15 Carl: (0.3) Øh (1.0) hvad ka man så [te:gn me:d]
 (0.3) Uh (1.0) what can one then draw with
- 16 [((*Carl Banker*
Carl knocks
i bordet))]
on the table
- 18 Mor: (0.2) Det du? (0.2) hva plejer i at te:gn med
 (0.2) What you (0.2) what usually you draw with
- 19 °dig og Rita°
 you and Rita
- 20 →Carl: (0.5) Øh (1.7) øh (1.4) øhhh
 (0.5) Uh (1.7) uh (1.4) uhhh
- 21 →Mor: (0.6) En kuglepen eller [en tusch.]
 (0.6) A pen or a marker
- 22 Carl: [Jahh]
 yeshh
- 23 Mor: Mmhmh?
 Mmhmh

24 Carl: Kuglepen [el-]

Pen o-

25 →Mor: [Jeg] tror du ska prøv at fortælle

I think you should try to tell

26 pign hva hun ik ska gøre

the girl what she not should do

27 →Carl: (0.3) Øh (0.3) .hh duss (0.5) <du ska ikke ta

(0.3)Uh (0.3).hh youss(0.5)you should not take

28 en tusch o' skri:v den.>

a marker and write it

29 Mor: (0.4) Nej

(0.4) No

30 Carl: (0.4) °°Skrive den°°

(0.4) Write it

31 Mor: (0.8) Jo (0.2) undskyld du ska ikke te:gn med

(0.8) yes (0.2) sorry you should not draw with

32 en ↑fisk (.) °du° ska' tegn med en ↑tusch

a fish (.) you should draw with a marker

33 (0.7) °prøv° at fortæll: hende det

(0.7) try to tell her that

34 →Carl: (0.3) og en bly:ant [du ska ik te:gn med en

(0.3) and a pencil you should not draw with a

35 fisk (0.4) du ska te:gn med en ↑flusch (1.1)

fish (0.4)you should draw with a flarker (1.1)

36 tus:ch]

marker

37 [((Carl begynder at banke
Carls starts to tap

38 *i bordet med flad hånd og skifter til knyttet*
the table with a flat palm and shifts to

39 *i slutningen af sætningen))]*
knuckle in the end of the sentence

Before Excerpt 1 begins, Carl has just identified that a girl is drawing with a fish and that this is not realistic. In l. 14 Mom asks Carl, what to draw with instead. Carl replies with a repeating repair, asking Mom, the same first-pair part question that she asked him, indicating that he has lost the intersubjective understanding. This indicates to Mom that he is giving the turn back to her, as he is not able to provide the second-pair part. Mom initiates the repair, by asking a new first-pair part question, linking it to something he is familiar with. In this case, she asks what he and Carl's little sister, Rita, usually draw with themselves. Carl initiates an other-repair in l. 20, which indicates to Mom, that he is still not able to understand, what is expected of him, in order to provide the second-pair part. This repair is indicated by long pauses and the intersubjective delaying word *øh* (*eh*). Mom then provides the second-pair part herself in l. 21: *En kuglepen eller [en tusch.]* (*A pen or a marker*). He then initiates a confirming turn-terminal, which he indicates that the intersubjectivity between Carl and Mom is reestablished. As Mom picks up on this, and by rising the intonation at the end of her *Mmhmh?*, she indicates to him in l. 23,

that he can take another turn, urging him to confirm the intersubjective understanding. Carl starts to repeat Mom's already provided second-pair part, which displays that he understands this action, as him having to provide the second-pair part that Mom just gave. However, by starting to speak mid-turn, Mom indicates that she wants him to provide the next preference organization turn, causing Carl to cut off his turn in the of the word *el-ler* (*or*; Excerpt 1, l. 24). She initiates an other-repair directing Carl to say to the girl, what she is doing wrong. This indicates that she has a specific preferred action in mind, which Carl does not perform leaving it noticeably absent, thus indicating that Mom's preference organization is a type R preference. Carl then takes his turn, providing a second-pair part that directs the girl on what not to do. This shows a withholding of contiguity, meaning that Carl understands what Mom wants him to do, however his answer is incorrect, since he implements a negatively indication of *ikke* (*not*) in l. 25. In this regard, he shows that he understands what action Mom wants him to perform, but he does not understand which information he needs to relay. Thus, he implements Mom's earlier second-pair part, that he was about to repeat in l. 24, into the action Mom indicates she wants him to perform in l. 25-26. This results in him implementing 'marker' as part of his reply, as well as the negative action of what not to do. Thus, making his answer incorrect. Mom firstly dismisses his reply as wrong, which is followed by Carl whispering a self-repair of repeating *skrive den* (*write it*; Excerpt 1, l. 30). This indicates that he does not understand what was wrong in his former turn, though it might have something to do with write, as the action wanted earlier was to reply what one can *draw* with. Mom gives a second-pair part direction in her next turn in l. 31-33, which displays the understanding that Carl does not know, what is expected of him. In order for him to understand her preference organization, she directs him, to repeat this new

second-pair part she provided. When Carl then provides a third utensil for drawing as well as repeating Mom's second-pair part, it indicates that he now understands the expectation.

This shows that Mom has a specific type R preference that she wants him to perform in the interaction. However, it is not all sequences that ends with Carl fulfilling and understanding the expectations. Consider the next few excerpts:

Excerpt 2 (T3)

Carl and Mom are Identifying Objects, and Carl Does Not Provide the Wanted

Answer

15 →Carl: (0.5) Møbler

(0.5) Furniture

16 ((Carl går rundt i køkkenet med sin bamse))

Carl walks around the kitchen with his teddy bear

17 →Mor: (0.6) Nej (.) hva er det=de:t' ik

(0.6) No (.) what is it=it's not

18 kategorien=>nu ska du si:g de:t' en ovn?< og

the category= now should you say it's an oven

19 hva er kategorien (.) ↑køkken

and what is the category (.) kitchen

20 ((Carl sætter sig på gulvet med bamsen))

Carl sits down on the floor with the teddy bear

21 Carl: (0.9) °Ja:° ((Vender sig på gulvet om til mor
(0.9)Yes Turns around on the floor to face Mom
22 og svinger bamse rundt))
and swings the bear around

In Excerpt 2 l. 17-19, Mom's type R preference organization is transparent, as she explicitly provides the preference directing Carl on how he should express it, as his answer was incorrect in l. 15. This causes Carl to lose interest, positioning himself on the floor with a teddy bear, and takes a turn performing his practice of yes quietly (Excerpt 2, l. 21), thus giving the turn back to Mom, as well as indicating with a quiet volume of voice, that he gives up and does not care anymore. The practice of yes will be elaborated at a later section.

Excerpt 3 (T4)

Carl has Named the Chicken as the Odd One Out, and is Explaining Why

34 →Carl: (0.3) Ja (0.4) [Fordi] at kylling den °ka°
 (0.3)Yes (0.4)Because that the chicken it does
 35 (0.5) de ka' jo (0.7) .hh kun svømm: ↑ovenpå
 (0.5)they do just(0.7) .hh only swim on top of
 36 vandet.
 the water

37 Mor: [Men]
 But

38 → (2.0) ↓_A:rh de:t vist- det var vist den her
 (0.2)Naah that's just- that was just this here
 39 var det ik?_↓ ((*Mor peger på forhenværende*
 was it not *Mom points to the previous*
 40 opgave))
task

Excerpt 4 (T12)

*Carl and Mom are Looking at a Task with the Pictures of a Mouse, a Cheese, a
 Mouse Trap and a Bumblebee*

13 Carl: =Og: (0.2) >°Hva er det?°< ((*Peger på et af*
 =And (0.2) What is this *Points to one of*
 14 *billederne*))
the pictures
 15 Mor: (0.7) Det er en musefælde?
 (0.7) It is a mouse trap
 16 →Carl: (0.4) En musefælde (.) og? (0.5) et ost (0.4)
 (0.4) A mouse trap (.)and (0.5)an cheese (0.4)
 17 men bien passer ik' den bo.hher ikke i et
 but the bee fits not it li.hhves not in an
 18 mu:sefæl:d (.) og spiser (0.2) ((*Peger med*
 mouse trap (.) and eats (0.2) *Points with*

[illegible]

Mom hits the table (0.3) then

31 fanger fæ:lden: (0.4) °den fanger musen° (0.6)

catches the trap(0.4)it catches the mouse(0.6)

32 [men (0.7) bien den går ik i °musefælden°

but (0.7)the bee it goes not in the mouse trap

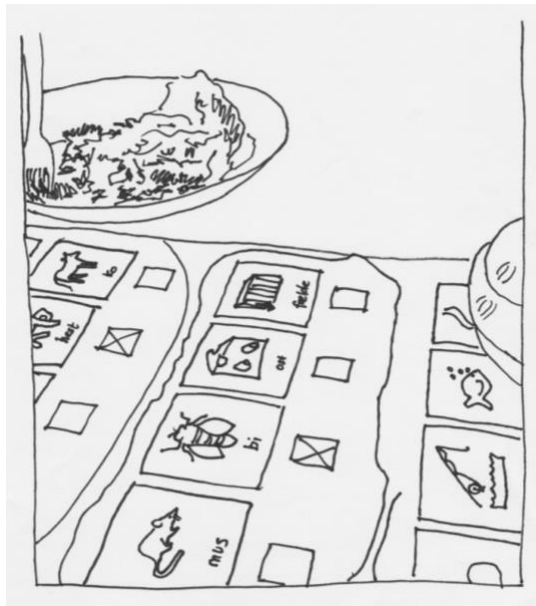


Figure 3. The odd one out. A picture task, where one out of four pictures needs to be pointed out, since it does not fit the rest of the pictures. The task is to exercise categorization. This figure shows a paper with the pictures of a mouse, a bee, a piece of cheese and a mousetrap.

In Excerpt 3 and Excerpt 4, Carl and Mom are solving a task of identifying the odd one out, out of four pictures (See Figure 3 for a picture of The Odd One Out). Mom initiates an adjacency pair with a question of, why the picture, previously identified by Carl, is the odd one out. The second-pair part Carl provides, would be correct, if understood from his point of view. The chicken is indeed the only one

swimming on top of the water (Excerpt 3, l. 34-36) out of the choices chicken, sheep, goat and rabbit. The bumblebee is indeed not eating cheese nor living in a mousetrap, as would the mouse (Excerpt 4, l. 16-19). However, Mom is not happy with these responses, as she corrects him in Excerpt 3, l. 37-40 and Excerpt 4, l. 20-21. She then proceeds to give him the answer she would have preferred, indicating to Carl what was absent in his own explanation. In four out of eleven instances, where Mom indicates that she has a specific preference organization in mind, she succeeds in getting Carl to implement her expected preference, as shown in Excerpt 1, however in the remaining seven instances, this preference is not understood by Carl, and Mom ends up having to provide the preferred information herself. Notably, in five of the instances, Carl provides a correct answer to Mom's question, however due to her type R preference, she notes what information is absent, and thus exposes this information by providing the answer she would prefer, he had given. These instances often either result in Carl either giving a third answer that makes sense to him or losing interest in the task altogether.

The missing next turn proof procedure.

An essential structure to focus on in light of the institutional setting is the next turn proof procedure. This fundamental structure concerns the receiver's understanding of the prior turn and through this understanding making it possible to construct a relevant next turn (Lester & O'Reilly, in press). It is crucial to look at both interlocutors' fulfillment of the next turn proof procedure during the verbal interaction, since it is equally important that Carl understands the questions and requirements, as Mom understands the answers and meaning Carl produces.

Carl implements two ways of responding in order to contribute to the progressivity in the interaction, when next turn proof procedure is missing in the sequences. Either Carl performs an other-initiated self-repair, indicating Mom to repair the trouble caused by missing understanding, or Carl allocates the turn by using a TCU with the interjectional word, *øh* (*uh/eh*).

Carl performs an other-initiated self-repair.

When the next turn proof procedure is missing, it is indicated in Carl's turn, as marked by a question, which appears through syntax referring back to Mom's prior turn. These patterns are found seven places in the transcripts. All examples show that Carl starts a new adjacency pair by asking a question, which indicates a lack of understanding for Mom's prior turn. The questions display an other-initiated self-repair, where Carl indicates Mom to do a repair, thus restoring the progressivity in the interaction. All examples play out during an assignment or conversation, where Carl starts a new adjacency pair by asking related questions, which indicates that Carl does not understand Mom's prior turn or knows what action to do. The action being how to answer the question Mom assigned. This can indicate one of two things; either Carl does not understand the meaning of Mom's questions or he does not know the answer. Every time Carl initiates the repair, Mom follows his initiative and either leads to the answer by giving a clue or provides the answer herself, thus removing the trouble from the conversation.

When Mom provides the correct answer.

Consider the following excerpt. Carl and Mom are doing an assignment, where Mom covers some objects with a blanket, and removes a few. When revealing

what objects are left on the table, Carl needs to point out which ones are missing.

This assignment exercises the ability to obtain an overview and to exercise the working memory of Carl.

Excerpt 5 (T22)

Carl has to Guess the Last Item Missing, which is a Black Spider

- 17 Mor: °.Toma:t og låg det ?rigtig (0.2) og e:n? mere
The tomato and lid that's right(0.2)and one
- 18 mangler°
more is missing
- 19 →Carl: (0.5) °Hvad mang::ler? (0.2) en mere°
(0.5) What's missing (0.2) one more
- 20 →Mor: (0.2) °it:sy bit:sy ↑_spi::der_↑° ((Syngende))
(0.2) itsy bitsy spider *Singing*
- 21 Carl: (0.2) [°↑Ja:°]
(0.2) Yes
- 22 [((Kigger på mor og nikker, inden han
Looks to Mom and nods, before he
- 23 *glider helt ned i stolen*))] (1.7) Ja
slides down in the chair (1.7) Yes
- 24 Mor: (0.8) £Hvad mangle:d mere?£
(0.8) What else was missing
- 25 Carl: (0.5) Ja (.) den var °sort°
(0.5) yes (.) it was black

- 26 → Mor: (1.1) Ka du husk hva der mangled?
 (1.1) Do you remember what was missing
- 27 [(5.4)]
- 28 [((Det høres, at mor tapper neglen i bordet
It is heard that Mom taps her nail on the
 29 *otte hurtige gange*))] *table eight fast times*
- 30 Carl: ↑_Den var soort_↑ (0.2) moar? .hh ((Carl
 It was black (0.2) mommy .hh Carl
 31 → sætter sig op igen)) det var ↑_ITSY BITSY
sits back up again It was ITSY BITSY
- 32 SPI:DE:R:↑
 SPIDER
- 33 Mor: (0.4) ↑↑Jaahahahaha ((Griner)) (0.6) ↑_Wee::↑
 (0.4) Yeshahahahaha *Laughs* (0.6) Wee
- 34 så:dan
 Good

Prior to the sequence Carl answered correctly on two of the missing objects, and Mom asks what the last missing object is in the first-pair part (Excerpt 5, l. 17). Carl replies by starting a new adjacency pair asking °*Hvad mang::ler? (0.2) en mere*° (*What's missing (0.2) one more*; Excerpt 5, l. 19), which displays an other-initiated self-repair and gives back the turn to Mom. Mom then follows his initiative and executes the repair singing °*It:sy bit:sy ↑_spi::der_↑*° (Excerpt 5, l. 20),

providing a second-pair part, telling Carl that the spider is missing. In his next turn Carl answers confirmatory by saying °↑*Ja*:° (*Yes*; Excerpt 5, l. 21), indicating an acceptance of the repair and an understanding of Mom's prior turn. This understanding becomes clear in the following turns. Mom asks again what was missing to get Carl to explicitly say the name of the object, where to Carl responds that it was black. In l. 26 Mom asks *Ka du husk hva der mangled?* (*Do you remember what was missing*), indicating a preferred organization again, which is to get Carl to say the name of the object. In his next turn Carl repeats that it was black, then providing the correct answer by repeating *det var ↑ITSY BITSY SPI:DE:R↑* (*it was ITSY BITSY SPIDER*; Excerpt 5, l. 31), fulfilling Mom's preferred organization.

In this example the answer leads to confirmatory reactions from Carl, indicating that the new information is understood. Mom then responds with multiple questions in her following turns indicating a preferred organization. In the end of the sequence Carl provides the correct answer and manages to fulfill the preferred organization that Mom indicated.

When Mom leads to the correct answer.

In Excerpt 6 Carl and Mom are doing social stories with dolls creating different scenarios to train Carl's social skills. Carl needs to give reasoning for what happens during the stories, which exercises theory of mind and coherence between happenings and situation. The aim is to train executive functions where Carl needs to be able to use his knowledge in multiple different scenarios.

Excerpt 6 (T23)

Carl Suggested that Doll Mathilde Hit Doll Lisi

62 Mor: ↓_Nej det må hun ik_↓ for hvad sker? der så?

No that can she not for what happens there
then

63 →Carl: (0.4) Hva [sker? der]

(0.4) What happens then

64 Mor: [Hvis Mathildi] slår (.) dukke

If Mathildi hits (.) doll

65 → Lisi=hva blir dukke Lisi °så?°

Lisi what becomes doll Lisi then

66 →Carl: (0.3) °Ked af det°

(0.3) sad by it

67 Mor: Hun blir rigtig ked af det (0.5) og hva er det

She becomes really sad by it (0.5) and what is
it

68 så Mathilde hun ska si? til dukke °Lise?°

then Mathilde she shall say to doll Lise

During the assignment one of the dolls hits the other and Mom asks Carl what happens to the doll when it is hit, which is the first-part pair of the adjacency pair (Excerpt 6, l. 62). Carl responds by starting a new adjacency pair with the question *Hva sker? der* (*What happens then*; Excerpt 6, l. 63), displaying an other-initiated self-repair, indicating that he does not understand and gives back the turn to Mom.

Mom is interrupting Carl's prior turn with a turn-terminal, giving an elaboration of her prior turn, which indicates that she knew he did not understand her question. Her elaboration ends with the TRP *Hva blir dukke Lisi °så?°* (*What becomes Doll Lisi then*; Excerpt 6, l. 65), which indicates to Carl that he should explain what emotion the doll has, when she gets hit. Carl answers in his next turn, that the doll becomes sad (Excerpt 6, l. 66), which is accepted by Mom, when she repeats his answer in her next turn.

In the next Excerpt, Carl and Mom are doing an assignment where they look at pictures with multiple objects and settings, and Carl needs to point out what is wrong and how to correct it. In the picture the assignment revolves around a cow swimming in water. Carl has just stated that the cow should not swim, but that sharks and fish should.

Excerpt 7 (T18)

Carl is Explaining that the Cow I Positioned Wrong in the Picture, as It Does Not Belong in the Water

- 17 →Mor: (0.5) Ja det er rigtig ↑hajer og fis:k (0.4)
 (0.5) Yes that is right sharks and fish (0.4)
- 18 [.hhja hvor] ska koen hen
 .hhyes where does the cow go
- 19 →Carl: [°Hajer og fisk°]
 Sharks and fish
- 20 (1.1) Ø:h (0.9) hvor ska' den hen ((Carl
 (1.1) Uh (0.9) where does it go Carl

- 21 *kigger på mor*))
 looks at Mom
- 22 →Mor: Hvor skal koen stå hen:? (0.2) og tyg græs
 Where should the cow be standing (0.2) and
 chew grass
- 23 Carl: (1.1) Øh på (0.3) bo:nde?gå::rden
 (1.1) uh on (0.3) the farm
- 24 →Mor: På bo:ndegården og på ma:rken ik os? (0.7)
 On the farm and on the field right (0.7)
- 25 .hhjah
 .hhyesh

Mom is telling him, that it is correct, and provides a first-part pair of the adjacency pair asking where the cow should be (Excerpt 7, l. 17-18). Carl repeats sharks and fish and responds *Øh (0.9) hvor ska' den hen (Eh (0.9) where does it go;* Excerpt 7, l. 20), starting a new adjacency pair, displaying an other-initiated self-repair, that indicates he does not understand and he therefore gives back the turn to Mom. Mom follows the initiative by responding *Hvor skal koen stå hen:? (0.2) og tyg græs (Where should the cow be standing (0.2) and chew grass;* Excerpt 7, l. 22), which is a clear indication of the cow having to be somewhere, where there is grass. In Carl's next turn he responds that the cow should be on a farm, answering the first questions Mom asked. Mom accepts this answer in her next turn by saying *På bo:ndegården og på ma:rken ik os? (On the farm and on the field right;* Excerpt 7, l.

24) stressing on the first part of both possible answers, indicating that Carl was right, but that there were two options.

In these two examples both clues are very precise, which makes a clear indication of Mom's expectation for what Carl needs to answer, and therefore the clues help Carl, in order for him to be able to answer the questions.

The previous three examples show that Mom has a crucial role in the sequences, which indicates that the next turn proof procedure only becomes restored by her clues or answers, and that she therefore is essential for Carl's learning process.

Carl allocates the turn.

Carl uses the interjectional word *øh* (*uh/eh*) as a full TCU eight times as a second-pair part to Mom's first-pair part in an adjacency pair indicating that the next turn proof procedure is missing. The function and meaning of this allocation for the verbal interaction between Mom and Carl will be analyzed as a part of the following sections, since it is related to Carl's use of *øh* as a full TCU.

The interjectional word *øh*.

The interjectional word, *øh* (*uh/eh*), is used multiple times by Carl, and it is relevant to analyze, what purpose it serves for Carl in order to understand his way of communicating in relation to a learning situation. Carl expresses *øh* in different relations in his verbal interaction with Mom, and it appears it has multiple functions when analysed. Carl is using the interjectional word as two different kinds of repair, when delaying his own turn and when indicating Mom to repair trouble caused by her turn. Additionally, it appears as a full TCU, when it follows Moms questions.

Delaying repair.

One function of the word *øh* is a repair in the same TCU, where the action component is a silence or delay. He applies these repairs in the beginning of the TCUs, followed by the second-pair part reply to Mom's first-pair part question. This indicates to Mom, an intention of keeping the turn, thus allowing him room for reaching the proper beginning or word in his turn-initiation. Consider Excerpt 8. Mom and Carl sit beside each other, with Rita sitting on the opposite side of Mom. They are doing the pictures task, where Carl needs to point out what is wrong and how to correct it.

Excerpt 8 (T20)

They Are Looking at Cartoons, Where a Crocodile Has Its Head Through the Window and a Girl is Drawing With a Fish in Her Hand

- 1 Mor: Ja i Afrika der har der os (0.2) °krogodiller°
 Yes in Africa there has there too (0.2)
 corodiles
- 2 → (0.3) ↑hva' med ↑pigen:=hva' tegner=hva' hun
 (0.3) what with the girl what draws what's she
- 3 ved at te:gn med?
 about to draw with
- 4 → Carl: (0.2) Øh (0.2) .hh en fisk der
 (0.2) Uh (0.2) .hh a fish that

5 → Mor: £Ehhjjj£

Nhho

6 Carl: =Der fly:ver

That flies

7 Mor: £Jaha£ hun er ved at tegn: med en fisk=ka' man

Yehes she is about to draw with a fish can one

8 tegn: med en fis:k?

draw with a fish

9 → Carl: (0.7) Der [flyv:er]

(0.7) That flies

10 [((Carl banker i bordet med flad

Carl knocks on the table with a

11 → hånd))] ja [nej]

flat hand Yes no

12 [((Carl ryster let

Carl shakes his

13 på hovedet en gang))]

head lightly once

14 → Mor: (0.3) °Hva' ka' man så teg:n mæ°

(0.3) What can one then draw with

15 →Carl: (0.3) Øh (1.0) hvad ka man så [te:gn me:d]

(0.3) Uh (1.0) what can one then draw with

16 [((Carl Banker

Carl knocks

17 *i bordet))*]

knocks on the table

18 →Mor: (0.2) Det du? (0.2) hva plejer i at te:gn med

(0.2) What you (0.2)what usually you draw with

19 °dig og Rita°

you and Rita

20 →Carl: (0.5) Øh (1.7) øh (1.4) øhhh

(0.5) Uh (1.7) uh (1.4) uhhh

21 →Mor: (0.6) En kuglepen eller [en tusch.]

(0.6) A pen or a marker

22 Carl: [Jahh]

yeshh

23 Mor: Mmhmh?

Mmhmh

24 Carl: Kuglepen [el-]

Pen o-

25 Mor: [Jeg] tror du ska prøv at fortælle

I think you should try to tell

26 pign hva hun ik ska gøre

- the girl what she not should do
- 27 Carl: (0.3) Øh (0.3) .hh duss (0.5) <du ska ikke ta
 (0.3)Uh (0.3).hh youss(0.5)you should not take
- 28 en tusch o' skri:v den.>
 a marker and write it
- 29 Mor: (0.4) Nej
 (0.4) No

Mom initiates an adjacency pair in l. 2, asking what the girl is drawing with. Carl leads, in l. 4, with an *Øh* a pause and a short breath indicating that he knows this and can answer, which he then does. But he does not get to finish the sentence until his next turn, as Mom laughingly confirms that the girl should not be drawing with a fish. She interrupts him, which indicates to Carl that he already provided the answer she wants, and he does not need to further elaborate.

The pauses often arising before or after Carl's delaying repair are all between 0.2-0.8 seconds and are followed by the second-pair part to Mom's first-pair part questions. All the delaying repairs appear in the beginning of his turns and end with the second-pair part reply. Since Carl and Mom's conversations normatively contains several pauses in their TCU's of between 0.2-0.6, the pauses before or after Carl's delay repair, are not intersubjectively indicative of a TRP between him and Mom. Here are a few more examples of Carl's repairing *Øh*.

Excerpt 9 (16)

Carl and Mom are Looking at a Cartoon of a Cat, Riding a Skateboard

6 → Mor: [Hva med ka-katten]

What about the ca-cat

7 → Carl: [Øh den ↑løber på]

Uh it rides on

8 skatebo:ardet [mo:a:r]

the skateboard mommy

9 Mor: [>Den har vi da ik' snakket om<]

It has we surely not talked about

10 ((*Carl er oppe og stå på stolen og læner sig*

Carl is standing up on the chair and leans

11 *ind over bordet*))

over the table

12 Mor: (0.2) [Mmhu?]

(0.2) Mmhu

13 → (0.3) Ska' den det?

(0.3) Should it that

14 → Carl: (0.5) Neji?

(0.5) No

15 → Mor: (0.2) Hvem er det der ska' lø:b på

(0.2) Who is it that should ride on

16 skateboardet?

the skateboard

17 Carl: =Nogen dre:nge

Some boys

18 Mor: (0.2) Er det dren:g?ne

(0.2) Is it the boys

19 Carl: (0.2) Ja

(0.2) Yes

20 Mor: .hh (0.3) Så sig det the dem

.hh (0.3) Then tell it to them

Excerpt 10 (T17)

Carl and Mom are Looking at a Girl Who is Walking on Water

1 → Mor: Rigtig↑ godt Carl=hva mæ ↑pi:gen

Right good Carl what about the girl

2 → Carl: (0.5) Ø-ø:h (0.8) hun ↑går i vandet↑

(0.5) U-uh (0.8) she walks in the water

3 Mor: (0.5) Går hun (.) ovenpå vand:t.

(0.5) Walks she (.) on top of the water

4 Carl: =Ja

Yes

5 → Mor: Mh (.) ka man godt [det?]

Mh (.) can one really that

6 → Carl: [Du] ska ↑ik' (0.7) gå

- You should not (0.7) walk
- 7 ovenpå vandet=du ska' (0.2) gå (1.0) der ska
on top of the water you should (0.2)walk (1.0)
there should
- 8 du svømme og du ska (0.3) gå (1.0) og du ska
you swim and you should (0.3) walk (1.0) and
you should
- 9 ↑gå på gulvet men det fordi moar når .hh man
walk on the floor but that because mommy when
.hh one
- 10 går (0.2) på noget vand så ka' man ?falde
walks (0.2) on some water then can one fall
- 11 mo::[ar]
mommy

Excerpt 11 (T37)

Carl and Mom are Looking at a Flower Pot Hanging Upside Down in a Window

- 21 →Mor: Rigtig? godt Carl. (0.3) Hva mæ ?blomsten
Right good Carl (0.3) What with the flower
- 22 →Carl: (0.7) ø:h? (0.4) [den vender] forkeert
(0.7) uh (0.4) it turns wrong
- 23 [((Banker to gange i bordet
Knock twice on the table
- 24 med flad hånd))]

with flat hand

25 →Mor: Hvordan ska den ve:ndn?

How should it turn

26 →Carl: (0.3) Ø- [?rigtigs:t]

(0.3) U- right

27 [((Bøjer overkroppen sidelæns så

Bends his upper body sideways so that

28 *hovedet vender nedad og retter sig op igen))]*

his head turns downwards and straightens up

again

A specific sequence appears in Excerpts 9, 10 and 11. In all three excerpts Mom initiates an adjacency pair, by asking a question, which Carl answers with a second-pair part reply that is correct and thus containing a next turn proof procedure. This indicates that although he needs a little time to reply, he knows the correct answer. Mom then initiates another adjacency pair, asking if the action Carl sees as not fitting in, should be or could be done. When Carl replies with a confirmation this action not being realistic, she once again initiates another adjacency pair question, asking what the character should do instead. Thus, when he uses this kind of repair he gets the success of finishing his turn, which in turn will keep Mom engaging in the conversation. The sequence shown, is standardized by Mom, in order to present a strategy to Carl for identifying what is wrong, and how to present it. Both Carl and Mom shows a rather consecutive turn design, with a steady principle of contiguity, although the institutionalized sequence in this learning situation, might be too rigid,

as it is highly dependent on the former speaker's intersubjectivity of how the sequence is to be executed.

Since this kind of repair does not happen during the interaction containing attention deficits, it might indicate that he only utilizes this kind of repair, when he is particularly engaged or concentrated. Carl implements this repair many times, and the amount that the delayed repair is displayed, indicates that it is a big part of Carl's communicative strategies.

Other-initiated self-repair.

Another way Carl applies the interjectional *øh*, is when he indicates to Mom that he does not have the required knowledge to provide a proper second-pair part reply to her question. This interrupts the progressiveness of the conversation, which he, by applying an other-initiated self-repair, indicates to Mom to repair. He does this, by using the interjection, followed by an elaborating framing of what he does not know.

Consider once again Excerpt 8. The framing in l. 15 appears as an almost exact repetition of Mom's first-pair part in l. 14, leaving it up to Mom, to apply the second-pair part herself. However, Mom asks the question anew, having repaired by providing more information in the new first-pair part TCU. It appears as part of the institutionalized sequence mentioned above in Excerpt 8, where Carl and Mom are doing the assignment with pictures. Following Mom's interruption of Carl's turn, confirming his reply, Carl finishes his turn, latching to Mom's confirmation, saying in l. 6: =*Der fly:ver* (*That flies*). This is the last part of Carl's initiated sentence in l. 4, making the meaning of it in its entirety *a fish that flies*. Mom smilingly confirms his answer of the fish flying, but repairs it, by applying pressure on the word *fish*,

and then asking if it is possible to draw with a fish, once again applying pressure on the word *fish*. This is an attempt to indicate to Carl that the answer should only contain fish, and therefore not the part about flying. This knowledge of Carl's, is from a previous task, where he identified a fish flying above water. However, he has now moved on to the next paper with new drawings. Carl produces a repair, which can be seen as a disagreement and initiates a multiple try repair by once again beginning his TCU in l. 9-13, by saying *that flies*, where after he applies the second-pair part, to Mom's question. His initial second-pair part is yes, but he corrects himself, dismissing the possibility of drawing with a fish. This indicates, that he is seemingly confirming his own statement, but correcting himself, in order to apply the second-pair part to Mom's question. Mom then asks what one can draw with instead, which Carl does not follow, as he after a long pause, initiates another other-repair, framing the action he displays missing an understand on how to answer. Thus, he indicates to Mom that the contiguity has been disturbed in the conversation. Mom initiates a self-repair which is expressed as a new adjacency pair question, referring to his everyday life procedures. This in order to help Carl understand what action is needed. She therefore asks in l. 18-19 what he normally draws with. Carl, once again initiates an other-repair, but this time his "øh" takes up a full TCU, with longer pauses in between. This indicates that he has lost the contiguity of the next turn proof procedure and allocates the turn back to Mom. This framing appears four times, and here is another example:

Excerpt 12 (35)

Mom and Carl are Looking a Cartoons, Where a Boy Appears to Be Sunbathing in a Bikini Top, Leading to Mom's Question

- 12 →Mor: (0.4) Mmh (0.7) [Hva bruer man egentlig
(0.4) Mmh (0.7) What uses one truly
13 brysterne til (.) ved du det Carl?]
the breasts for (.) know you that Carl
14 [((Carl banker først med
Carl knocks firstly with
15 fronten på håndledet så med knoerne ned i
the front of the wrist, then with the knuckles
16 bordet 8 gange))]
in the table 8 times
17 →Carl: (0.3) Øøh (0.2) ((Banker én gang mere med
(0.3) Uuh (0.2) Knocks once more with the
18 knoer)) hvad? ?bruger man dem the
knuckles what uses one them for
19 Mor: (0.2) Er det noget med en bæibi
(0.2) Is it something with a baby
20 Carl: (0.3) ↑Ja
(0.3) Yes

Øh as a full TCU.

Carl has a tendency of initiating the other-repair *øh* as a full TCU. In Excerpt 8, l. 20, it is an indication of a turn allocation, and it follows a question from Mom. The repair is either prior to a shift in turn as above, or a long pause, until he speaks again. This turn allocation is indicated by the confirmation or proper turn-taking after

Mom's reply. As shown in Excerpt 8, Mom has initiated a couple of repairs in order to restore the progressivity of the conversation, however when Carl still does not understand, she herself provides the second-pair part to her initial and repaired first-pair part questions.

If the turn is not taken by Mom, the intention is transparent because the following pause is often very long, before Carl picks up his turn again. His continuing TCU, is often lacking the next turn proof procedure, as his reply is both incorrect and insecure. The insecurity is shown by the following frequent pauses and self-repairs like *øh* and short breaths in the middle of words and sentences. Self-repairs and pauses during his pronunciation of the words, allows him time to think of the correct words, he wants to apply in his second-pair part. Consider the following excerpt, where Carl and Mom are doing the assignment with pictures, and Carl needs to point out what is wrong and how to correct it.

Excerpt 13 (T15)

Mom and Carl are Looking at a Cartoon Figure of a Girl Riding a Scooter with One Wheel Replaced by a Shoe

4 Mor: De:t ↑rigtigt (.) for hva? (0.5) hva ka? hun

That's right (.) for what (0.5) what can she

5 hvis hun har to hjul:

if she has to wheels

6 → Carl: (0.4) Øh (0.5) .hh [Øh]

(0.4) Uh (0.5) .hh Uh

7 → Mor: [Så ka'] hun (1.0) så ka'

Then can she (1.0) then can

- 8 hun <løbe på lø:behjul>=ka du si' det?
 she ride on scooter can you say that
- 9 Carl: (0.5) Så kører hun på lø:behjul
 (0.5) Then drives she on scooter

In Excerpt 13, l. 7-8 Mom recognizes Carl's attempt to facilitate an other-initiated self-repair with the interjectional word *øh* positioned as a TPR. This is indicated by her initiative of a turn-terminal, answering her own first-pair part question, however prompting Carl to repeat her second-pair part reply. This prompt is actually another other-initiated self-repair, making the initiated repairs multiple tries. The repair is successful in both cases, however learning might not be, as Carl's repetition of Mom's second-pair part is altered to fit his own understanding of how to ride a scooter.

This understanding of *øh* as a TPR is shown in three more places, but it is not in all instances Mom picks up her turn - rather she waits for Carl, to figure out a reply on his own, resulting in an insecure reply containing multiple self-repairs. In Excerpt 14, during the assignment regarding working memory, identifying missing objects, Carl implements *.hhh (0.3) Øøøh (.hhh (0.3) Uuuh*; Excerpt 14, l. 18-19), followed by a rather long pause (3.3 seconds), attempting to allocate the turn to Mom, since he does not look at the items on the table. Mom does not take the next turn, and therefore Carl ventures a guess in l. 21, self-repairing instead of implementing a strategy on how to figure out the right answer. This TCU entails delaying repairs, as he divides the word with pauses and breaths indicating an insecurity in the guess. The same happens in Excerpt 15, l. 1-7 during the picture

task. Thus, Carl implements ϕh as a TPR, because he wishes to allocate his turn, as he is insecure of the correct answer to Mom's questions.

Excerpt 14 (T6)

Carl's Task is to Identify the Missing Items on the Table, But Does Not Look Down on The Items

17 Mor: (0.8) Sådan:=hva mangle:r?

(0.8) There what's missing

18 →Carl: .hhh (0.3) Øøøh

.hhh (0.3) Uuuh

19 [(3.3)]

(3.3)

20 [((Carl kigger ikke ned på tingene, men har
Carl is not looking down at the stuff, but has

21 mere fokus på at aflæse mor))]

more focus on reading Mom

22 →Carl: Kugle (0.7) -pe.hhh -ne:n o:::h ((Kigger sig

The (0.7) pe.hhh -en and Looks over

23 over skulderen, og har stadig ikke kigget ned

the shoulder, and still has not looked at the

24 på tingene på bordet))

the stuff on the table

25 Mor: =Nej

No

- 26 Carl: [=o::::h]
and
- 27 Mor: [Kuglepennen °er her°]
The pen is here
- 28 Carl: .hhhhh hhh ((*Kigger på mor*))
.hhhhh hhh *Looks at Mom*

Excerpt 15 (T32)

Mom and Carl are Looking at a Cartoon Figure of a Bird Flying Upside-Down

- 1 → Carl: Øh (1.1) ø:h (1.1) ((*Klasker hånden på*
Uh (1.1) uh (1.1) *Slaps the hand on the*
2 → *papiret*)) (0.4) ø:h (0.3) og [fuglern (0.2)
paper (0.4) uh (0.3) and the birdy (0.2)
3 .hh]
.hh
- 4 [((*Vifter hånden*
Fans the hand
5 *slapt med pegefingeren strækt*))] ø:h hh (0.3)
loosely with the index finger straightened
uh hh (0.3)

6 ha- [fuglern .hh <fuglen] den ryk (0.5)
 he- the birdy .hh the bird it pulls (0.5)
7 den .hhh fuglen den rykker s:ine arme heroppe>
 it .hhh the bird it pulls its arms up here
8 [((Banker hånden let på papiret, med let
 Knocks the hand lightly on the paper,
9 *bøjet pegefinger syv gange))]*
 with a slightly bend index finger seven times
10 Mor: Ja fuglen
 Yes the bird
11 Carl: =Nej
 No
12 Mor: =Har s: (0.3) den har be[nene] opad
 Has s (0.3) it has its legs upwards

The key to interpret, which kind of repair Carl is using, either a self-repair or an other-initiated self-repair, is the long pauses, or the following framing of what he did not project from the previous speaker's turn. These both indicate a turn allocation to Mom, who then proceeds to take a repairing turn either asking the question again, thus providing a new first-pair part or providing a second-pair part answer to her original question.

Carl's practice, Yes.

The intersubjectivity between Carl and Mom is clear, when Carl implements the word *ja* (*yes*) as a full TCU. The word is not used as usual, such as a confirmatory action, or a second-pair part to a first-pair part question, and therefore in some instances it seems misplaced. Consider this pattern in the following excerpt:

Excerpt 16 (T33)

Carl and Mom are Looking at Cartoon Figures, Where an Owl is Placed on the Ground and The Hare is Placed in a Tree. Mom Wants Carl to Tell Them to Switch Places

19 Mor: (0.4) Mmhmh?

(0.4) Mmhmh

20 Carl: (0.2) . hh [o-gh]

(0.2) .hh and

21 Mor: [ska] den det?

should it that

22 Carl: (0.2) Nej (0.3) den ska være >i et< hul:

(0.2) No (0.3) it should be in a hole

23 Mor: (0.3) A:ah.

(0.3) Aah

24 Carl: =Hvis nu man sir dender ska være ?herned: og

If now one says that one should be down here and

25 uglen ska være herop.

the owl should be up here

26 Mor: Mmh?

Mmh

27 Carl: Haren ska være herned: og uglen skal være

The hare should be down here and the owl

should be

28 herop.

up here

29 Mor: (0.3) Det' [rigtigt]

(0.3) that's right

30 Carl: [haren] skal være herne:d og

the hare should be down here and

31 uglen ska være herop. ((*Han kører samtidigt*

the owl should be up here *At the same time,*

32 *pegefingeren frem og tilbage på papiret mellem*

he slides his index finger on the paper

33 *haren og uglen*))

between the hare and the owl

34 →Mor: (0.2) Ved du hvad så man kan sige the dn?

(0.2) Know you what the none can say to it

35 →Carl: =Ja?

Yes

36 →Mor: (0.4) Du ka (0.2) s-si:g til dem at de ska

(0.4) You can (0.2) s-say to them that they

should

37 bytte plads:

 switch place

38 Carl: (0.4) I ska bytte plads?

 (0.4) You should switch place

39 Mor: (0.4) Ja? (1.0) ?det tror jeg de gør lige om

 (0.4) Yes (1.0) that think I that do in a

40 lidt.

 minute

This assignment deals with the picture task, where Carl needs to point out what is wrong and how to correct it. In Excerpt 16, l. 30-31 Carl finishes a string of turns, repeating three times that the rabbit should be on the ground and the owl should be in the tree. Mom's other-initiated other-repair is expressed, by proceeding to ask, if Carl knows what he should say to the picture. Carl replies =*Ja?* (*Yes*; Excerpt 16, l 35), latching and indicating a question with an intonation. Mom proceeds to give an example of what he could tell the picture. In these lines, Carl's yes is not confirmatory of the question, but rather an indication of him listening and ready for more information. This is a practice implemented by him, which is understood by Mom, who in her turn proceeds to give him more information, indicating that she understands his turn as a practice, which is shown by her reply. Had she misunderstood the practice, taking it as confirmatory, she might have asked Carl to explain his answer. By taking her turn after *yes*, she shows an intersubjective knowledge of this as his practice, and that it is also a TRP. Although she waits a short while (0.4 seconds) to reply, her turn contains a next turn proof procedure, as

she answers her own question in her prior turn, thus applying the second-pair part (Excerpt 16, l. 36) to her own first-pair part (Excerpt 16, l. 34). Carl confirms her recognition of the action his practice was meant to cause, by not trying to repair her turn design, but instead picks up her information to use in his own turn. Thus, the progressivity in this sequence is not interrupted. Carl's practice is shown in 19 places, often as a part of a similar sequence as shown in Excerpt 17:

Excerpt 17 (T4)

Mom and Carl are Identifying the Odd One Out, and Mom Has Just Reasoned to Herself, Why the Chicken is the Answer

73 Mor: [(1.3) °Det tror jeg°] (0.6) Prøv'o kig? på
(1.3) It think I (0.6) Try to look at

74 mig
me

75 [((Carl leger videre))]
Carl keeps playing

76 Carl: ((Carl kigger hurtigt op, men ser ned igen på
Carl looks up quickly, but looks down again at
77 legetøjet))
the toy

78 →Mor: Ved du hva man ska husk
Know you what one should remember

79 →Carl: =Ja.
Yes

80 →Mor: At tænke tænke tænke

To think think think

81 ((*Carl har stadig fokus på legetøjet på*

Carl still has focus on the toy on the

82 *bordet*))

table

In Excerpt 17 the assignment helps exercising categorization, where Carl needs to point the odd one out. Mom asks Carl, what he should remember, which Carl answers with a latching =*Ja*. (*Yes*; Excerpt 17, l. 79), and a falling intonation, indicating an end of a turn and a lack of enthusiasm, selecting next turn for Mom to tell him what she means.

Excerpt 18 (T12)

Mom and Carl are Identifying the Odd One out. Mom Wants Carl to Elaborate How his Answer is Correct

20 →Mor: (0.6) Nej det er rigt=nej ved du hvordan det

(0.6) No that is corr= no know you how it

21 hænger sammen

connects together

22 →Carl: =Ja

Yes

23 ((*Carl klikker med kuglepen hurtigt*))

Carl clicks with the pen rapidly

24 →Mor: (1.8) Inde? i en musefælde der ka man [læg et
 (1.8) Inside in the mousetrap there can one put
 25 styk ost]
 a peace of cheese

26 [((Mor
 Mom
 27 peger på papir))] (.) og så går musen ind
 points to papir (.) and then goes the mouse in
 28 (0.3) og henter osten og så
 (0.3) and gets the cheese and then
 29 sir den (.) [ban:g]
 says it (.) bang

30 [((Mor slår i bordet))] (0.3) så
 Mom hits the table (0.3) then
 31 fanger fæ:lden: (0.4) °den fanger musen° (0.6)
 catches the trap(0.4) it catches the mouse(0.6)
 32 [men (0.7) bien den går ik i °musefælden°
 but (0.7) the bee it goes not in the mouse trap
 33 ((Mor siger trutlyd))]
 Mom makes a pouting sound

In Excerpt 18, the assignment is still for Carl to point the odd one out. Mom asks Carl, if he knows the connection, and in the next turn Carl replies =Ja (Yes; Excerpt 18, l. 22). After a pause, Mom starts explaining to Carl, what the right

answer is. In this regard Mom gives Carl a second chance to reply with a second-pair part, which he does not take, thus Mom takes the turn.

Excerpt 19 (T18)

Carl and Mom is Looking at a Cow Swimming in the Sea

6 Carl: [[KOEN DEN] SEJLER I VANDE:T]

The cow it sails in the water

7 [((Carl slår på papir))]

Carl pounds on the paper

8 → Mor: (0.3) Ved du hva jeg tror den gør?

(0.3) Know you what I think it does

9 → Carl: =Ja

Yes

10 → Mor: =Jeg tror den .svømmer

I think it swims

Excerpt 19 revolves around the picture task, where Carl needs to point out what is wrong and how to correct it. In l. 8 Mom is asking Carl if he knows what she thinks, which Carl responds to with =*Ja* (*Yes*; Excerpt 19, l. 9). Mom then takes a turn explaining that she thinks, it (the cow) is swimming. Every example shows, that Mom initiates an adjacency pair formed as a question and answer, doing the first-pair part herself. However, Carl responds with the practice *Yes*, indicating he wants more information. In the next turn Mom is answering her own question, fulfilling the second-pair part, that Carl did not provide.

These examples show a sequential pattern, that the practice *Yes* does not have the usual confirmatory meaning of a yes, but fosters a different meaning, that is shared between Mom and Carl. Also, the practice does not function as a second-pair part to Mom's first-pair part, causing her to repair the interaction by answering the question herself, and thereby making up for the lost second-pair part in Carl's turn.

Attention Deficits

Having ASD, Carl seems to struggle with attention deficits. During the interaction with Mom, his level of engagement varies, and is exhibited through interactional focus, as he sometimes is distracted by toys or does not engage in the conversation. The following analyses focus on Mom's reactions towards Carl's changing focus or loss of engagement.

Mom's preface repairs.

Carl's attention deficits are made transparent by Mom. Firstly, she uses the command, *prøv at (try to)* in different variations, as a preface repair, when Carl is not paying the attention, to either the task or Mom, she deems necessary for a profitable learning outcome. These are variations such as *°prøv at kig på mig°* (*try to look at me*; Excerpt 22, l. 13) or *prøv li o' hør her* (*just try to listen here*; Excerpt 23, l. 7). In the same TCU Mom ends the command with a direction of what should be used to honor the command. This is often either *at kigge* (*to look*) or *at høre* (*to listen*). The resulting outcome of the commanding TCUs refer back to which command is used.

Excerpt 20 (T4)

Carl has Just Pointed to The Picture of The Chicken, and Replied with an Explanation of the Chicken Being the Only One Capable of Swimming on Top of the Water

45 Mor: A:ej,

Noo

46 →Carl: [Du tager fejl]

You are wrong

47 →Mor: [Kyllingens] (0.2) kyllingens mor (0.4)

The chicken's (0.2) the chicken's mom (0.4)

48 de:t en høn: (0.4) ing'?

that is a hen (0.4) right

49 →Carl: (0.5) Mmh?

(0.5) Mmh

50 →Mor: Mmh? (2.6) og f:å:r kanin ged og kyll=jeg ved

Mmh (2.6) and sheep bunny goat and chic=I know

51 faktis heller ik helt hva huh (1.0) fhvilken

really either not quite what huh (1.0) which

52 en de:r rigthig må jeg si:gŧ (0,7) er det

one that's right have I to say (0.7) is it

53 → fordi (0.7) nu sku vi tænk os om (0.3) tænke

because (0.7) now should we think about (0.3)

think

- 54 tænke tænke Carl få:ret (1.8) °kanin ged°
 think think Carl the sheep (1.8) bunny goat
- 55 → (2.5) .hh er det fordi (0.8) at de her de
 (2.5) .hh is it because (0.8) that these here
 they're
- 56 voksne og det (.) er et barn (0.3) ((*Peger på*
 adults and this (.) is a child (0.3) *Points to*
 57 *kylling*)) en kylling? °det er jo en lille
 the chicken a chicken it is really a small
 58 bæibi° (0.8) men (0.5) ↑fårets: (0.6) prøv at
 baby (0.8) but (0.5) the sheep's (0.6) try to
 59 → hør ↑fårets bæibi det hedder et lam ((*Carl*
 listen the sheeps baby it is called a lam *Carl*
 60 *kigger væk og tager fat i noget papir, der*
 looks away and grabs some papir that
 61 *ligger på bordet*)) Kaninens bæibi det hedder
 lies in the table The bunny's baby it is
 called
- 62 os: (0.8) °ja° det hedder vist os bar en kanin
 too (0.8) yes it is called supposedly too just
 a bunny
- 63 bæibi (0.9) og gedens (0.4) bæibi hedder (0.6)
 baby (0.9) and the goat's (0.4) baby is called

(0.6)

64 et ?gedekid (2.4) og hø:nens bæibi hedder en
a kid (2.4) and the hen's baby is called a

65 → kylling (0.5) Carl?
chicken (0.5) Carl

66 → Carl: (1.1) °Okay° ((*Har fokus på legetøj på*
(1.1) Okay *Has focus on the toy on*
67 *bordet*))
the table

68 Mor: (0.6) Ved du godt de:t derfor (0.3) at de:t
(0.6) Know you really that's why (0.3) that it's
69 kyllingen der går ud=det fordi [de:t en bæibi
the chicken that stands out it's because it's
a baby

70 og de andre de:t voksne]
and the others are adults

71 [((*Peger på*
Points to
72 *opgavepapiret*))]
the task paper

73 → Mor: [(1.3) °Det tror jeg°] (0.6) Prøv'o kig? på
(1.3) It think I (0.6) Try to look at

- 74 mig
 me
- 75 [((*Carl leger videre*))]
 Carl keeps playing
- 76 →Carl: ((*Carl kigger hurtigt op, men ser ned igen på*
 Carl looks up quickly, but looks down again at
77 *legetøjet*))
 the toy
- 78 Mor: Ved du hva man ska husk
 Know you what one should remember
- 79 Carl: =Ja.
 Yes

In Excerpt 20, Mom and Carl sits across from each other at a table, trying to solve a task of identifying the odd one out, training the ability to categorize. In l. 45, Mom dismisses Carl's turn as incorrect. Mom and Carl each self-selects in a turn-initial, which Mom ends up continuing, after a short pause. In this turn-initial, l. 46, Carl tries to repair Mom's dismissal by telling her, she is wrong. However, Mom is already trying to explain her preference organization of how this task is solved correctly. She ends her turn with a TRP of rising intonation on *ing'*? (*Right*; Excerpt 20, l. 48), indicating a question of understanding. In the second-pair part of this question Carl simply acknowledges her explanation with a confirming TCU *Mmh?* (Excerpt 20, l. 49) after, what seems to be a hesitant pause of 0.5 seconds. The rising intonation is a TRP for Mom, urging her to go on with the next turn. Mom begins her

turn in l. 50, repeating Carl's acknowledgement, but then pausing for a long while (2.6 sec). She begins the explanation, but then initiating a self-repair deleting part of the sentence already begun, indicating that the long pause and self-repair is most likely because she herself is unsure of the answer. This is transparent when the same TCU continues to have multiple self-repair components; l. 51 contains a replacing of *Hva* (*What*) with *Hvilken* (*Which*), l. 53 contains a parenthesizing repair, when she exclaims *Nu sku vi tænk os om* (0.3) *tænke tænke tænke* (*Now should we think about* (0.3) *think think think*), and then repeats the already begun sentence *er det fordi* (*is it because*; Excerpt 20, l. 55). In l. 53, she wants Carl to pay attention, which she makes clear by initiating an other-other repair preface, saying *Prøv at hør* (*Try to listen*; Excerpt 20, l. 59), and then continues her explanation. Meanwhile Carl has grabbed a piece of paper on the table (Excerpt 20, l. 55-56). Mom keeps going with her prolonged TCU, still implementing self-repairs. She deletes her sentence, only to pick it up again with a confirmative, but quiet °*ja*° (*yes*; Excerpts 20, l. 62). Carl has not responded in any of the relatively long pauses, which might be because of Mom's self-talking action. However, in the end of Mom's TCU, she holds a rather long pause of 2.4 seconds, which should have projected a TRP to Carl, but he does not reply, indicating he is not paying attention. When he doesn't take it, she ends her turn, with the previous statement (Excerpt 20, l. 47) that a baby of a hen is called a chicken (Excerpt 20, l. 64-65). She holds another short pause and then selects Carl by name, allocating the next turn to him. Carl pauses for a long time (Excerpt 20, l. 66), and then replying quietly °*okay*°, without taking his eyes off the toys. Mom tests his attention by asking if he knows the reasons she just explained and points at the pictures. This time Carl doesn't pick up the second-pair part of the question, and Mom ends up taking the turn herself, applying the answer. She initiates a repair

preface of *Prøv o' kig? på mig* (*Try to look at me*; Excerpt 20, l. 73). indicating that she is certain, he is not paying attention. The command and direction of having to look, finally facilitates a response from Carl, if only a short glance up at Mom, indicating that Mom successfully shifted his attention from the toys to her, though lost it again. Thus, this shifting of attention from the distraction to the wanted focus point is only successful, when Carl is asked to shift his gaze, but not when asked to listen. More of these sequences are found in several transcription, but a few is listed below:

In Excerpt 21 during exercising the working memory, Carl should identify which items are missing on the table, but has not looked at the items, since they were revealed, however he has ventured a few wrong guesses. He has only looked at Mom. In l. 29 Mom asks him again, what is missing, but it is not until she initiates the repair preface of *>prøv at kig Carl<* (*try to look Carl*) that he actually gets a couple of the items correct.

Excerpt 21 (T6)

Carl's Focus is Not on the Task, as He is Not Looking at the Missing Items, and Mom Initiates a Repair, Refocusing his Attention

29 Mor: (1.3) Hva mangler?

(1.3) What's missing

30 Carl: (1.9) Ø::h (1.5) mo:ar

(1.9) uh (1.5) mommy

31 Mor: (0.3) Mmh?

(0.3) Mmh

32 Carl: Hun[↑] mangler [nah huh]

- She's missing nah huh
- 33 Mor: [ɛNej jeg] mangler ihhkɛ Huh huh
No I'm missing nohht huh huh
- 34 → (0.3) >prøv at kig Carl<
(0.3) try to look Carl
- 35 →Carl: (0.7) Der mangler to↑ma:ten o:h .hhh (1.0)
(0.7)There's missing the tomato and .hhh (1.0)
- 36 musen (.) oh LÅ::T_↑((*Kigger på mor,*
the mouse (.) and the lid *Looks to mom*
- 37 *smasker og smiler*))
munches and smiles

The same goes for Excerpt 22, where Carl and Mom reads a story about Grethe and Mette, and Carl needs to put himself in the characters place to exercise theory of mind (See Figure 4 for a representation of the task). However, the focus of his gaze, and as shown, his attention, is himself in the camera. Mom implements the repair preface, with her eyes as the focus point of the directional command, and thus gain his attention, as he looks at her. However, when he later in the same transcript, again pays attention to the camera instead of the task, Mom firstly, tries to give a normative command *Se↑ her* (*Look here*; Appendix 3, T7, l. 24), but this does not foster Carl's attention. She implements a preface repair *prøvoghør-prøvoghør* (*try to listen-try to listen*; Appendix 3, T7, l. 32, 36) twice, indicating that she wants to gain his attention, but this command directs him to listen, which, our results show, he does not respond to, as he keeps looking into the camera.



Figure 4. Theory of Mind is in this task exercised through reading a story about two girls, where the ability to understand other people's point of view. This figure displays Carl eating peanuts and looking into the camera.

Excerpt 22 (T7)

Mom and Carl are Starting a Task of Theory of Mind. Carl is Not Focusing on the Task, But Rather on the Camera. Mom is Trying to Gain His Focus

- 10 [å:h ba ba ((Lader som om han spiser peanuts
 Oh ba ba Pretends to eat peanuts
- 11 imens han kigger ind i kameraet))]
 while he looks in to the camera
- 12 Mor: [Huh huh huh ((Griner))] Er du klar? (0.6)
 Huh huh huh *Laughs* Are you ready (0.6)

- 13 → °prøv at kig på mig° (0.3) °kig på mine [øjene]
 try to look at me (0.3) look at my eyes
- 14 Carl: [Ja]
 Yes
- 15 ((*Kigger stadig ind i kameraet*))
He is still looking in to the camera
- 16 →Mor: (0.5) Mi:n øjen ((*Carl kigger op på mor*)) Ska
 (0.5) My eyes *Carl look up at Mom* Should
 17 vi læ:s den næste historie
 we read the next story
- 18 Carl: (0.2) [Nej den der]
 (0.2) No that one
- 19 [((*Slår hånden ned i bogen de sidder*
Hits his hand down on the book that
 20 *med*))]
they are using

Mom implements the repair preface again in Excerpt 23, while playing a board game to obtain the ability of categorization by explaining which objects goes together. However here, Mom follows the preface repair with a physical knock on the table, prompting Carl to look at her, and provide an attentive, but quiet °.hja° (yes; Excerpt 23, l. 9).

Excerpt 23 (T8)

Carl is Disregarding Turn-taking, as He Interrupts Rita's Turn in the Game. When Carl Does Not Acknowledge Mom's Repair, She Knocks on the Table.

- 3 Mor: Ja (0.3) så lægger du den der (0.2) Carl↑
 Yes (0.3) then put you it there (0.2) Carl
- 4 (0.5) prøv at kig på mig det er Rita der ska
 (0.5) try to look at me it is Rita who should
- 5 ha dem the [at hoppe nu]
 have them to bounce now
- 6 → Rita: [AAAAAAAAAAV]
 Oooouuuch
- 7 → Mor: (0.4) Carl? prøv li o'hør her (0.4) ((Mor
 (0.4) Carl try just to'listen here (0.4) Mom
- 8 *banker i bordet))*
slaps the table
- 9 → Carl: (0.2) [°.hja°]
 (0.2) .hyes
- 10 [((Ser over på mor))]
Looks over to Mom
- 11 Mor: (0.2) [Hvem er det der ska ha dem the at hop]
 (0.2)Who is it that should have then to bounce
- 12 [((Carl sætter sig tilbage på stolen))]
Carl sits back down in the chair

13 Carl: =RITA

Rita

Excerpt 24 (T11)

It is Carl's Turn to Provide Mom with an Answer of, what is on The Side of The Stick, that Faces Her. The Task is for Carl to Know What is on the Side, Facing Away From Him, of a Stick with Two Pictures.

1 Mor: Nåh du vil simhen ha en ny (0.7) nu? ska vi

Well you will simply want a new (0.7) now

should we

2 li' spørge en gang mere med Carl (0.7) Ca:rl?

just ask one time more with Carl (0.7) Carl

3 (.) hva er der (0.5) på den her side? ((Mor

(.) what is there (0.5) on this here side Mom

4 holder en pind op med et billede på hver side

holds a stick up with a picture on both sides

5 → af pinden. Rita snakker i baggrunden)) =Prøv

of the stick. Rita speaks in the back Try

6 → li at kig på den=hva er der på den ((Carl

just to look at it=what is there on it Carl

7 sidder og piller ved noget lærerens tyggegummi

is sitting and fidgeting with a piece of

booklet lot

8 *han ser kort op på mor)*
 he looks quickly up at Mom

9 → Carl: [(0.3) °De:t en broccoli°]
 (0.3) That's a broccoli

10 [(*Kigger på sine hænder og holder lærerens*
 Looks at his hands and holds the booklet
 11 *tyggegummi*))]]
 lot

12 Mor: (0.6) Ja (.) Og hva er der på den her si:d?
 (0.6) Yes(.) And what it there on this here side

13 ((*Mor vender pind*))
 Mom flips stick

14 Carl: (0.8) °Toma:t° ((*Kigger ned på lærerens*
 (0.8) Tomato *Look down at the booklet*
 15 *tyggegummi*))
 lot

16 ((*Rita snakker i baggrunden*))
 Rita talks in the back

17 Mor: (0.6) °Toma:t.° Og hva' kigger jeg på nu Carl?
 (0.6) Tomato and what look I at now Carl

18 Carl: (°°Det ved jeg ik'°°) >Hvad kigger du< °°på°°
 It know I not What look you at

19 (2.2) >Gulerod<
 (2.2) Carrot

In Excerpt 24 Mom addresses Carl by name, followed by the action of preface repair, asking him once again to try to look (Excerpt 24, l. 2-6). By doing so Mom displays an understanding of Carl's behavior as lack of attention. Shortly after Mom's repair, Carl gazes up at Mom, displaying that he has understood her action. He then provides the correct second-pair part to Mom's first-pair part question (Excerpt 24, l. 9).

In both Excerpt 23, l. 6 and Excerpt 24, l. 5, Rita overlaps Mom's turn, and during her next turn, Mom initiates preface repair, to regain Carl's attention. This indicates, that he is distracted, when Rita speaks out of turn. These examples show that Carl is easily distracted, when Mom's attention is elsewhere, or when his baby sister speech is overlapping Mom's speech. He needs help to regain focus on the task, by directing his attention to the task at hand, be either to solve the assignment or to provide Mom with a confirmation of attention.

Mom takes two turns.

The lack of attention on the task by visually focusing, also results in another disturbance of the progressivity in the conversation. Mom often takes two turns in a row, which indicates that Carl is no longer interested and thus not concentrating, as he does not reply. She self-selects the next turn, after initiating an other-repair in order for Carl to regain attention on the task. However, when he does not repair, she continues, as if repaired. Consider the following excerpt. In this excerpt, Mom and Carl are doing a task of telling social stories, exercising theory of mind and

coherence between happenings and situation, thus training executive functions where Carl needs to be able to use his knowledge in multiple different situations. In this task, they look at a picture with two boys, one of them playing with a toy resembling a dinosaur (See Figure 5 for a representation of this task).



Figure 5. Social Stories is a task of telling social stories, exercising theory of mind and coherence between happenings and situation, thus training executive functions through the ability to use knowledge in multiple different situations. This figure entails a picture of two boys, one of them playing with a toy resembling a dinosaur.

Excerpt 25 (T1)

Mom and Carl are Looking at a Picture of Two Boys and a Toy Dinosaur. Carl Loses Interest, When He is Asked to Repeat His Answers

- 8 Mor: (1.0) Og her står Frederik. (1.1) Og hva' (0.5)
 (1.0) And here stands Frederik (1.1) And what
 (0.5)
- 9 tror du Frederik siger til Kim

think you Frederik says to Kim

10 Carl: (0.9) °At han vil ha (0.4) den duosaved°

(0.9) That he will want (0.4) the dinosaur

11 →Mor: A:h?ah så Frederik han vil os? gern le:g med

Ahah so Frederik he will to like to play with

12 Kims dinosaur (0.5) J.hh (0.8) men tror du

Kim's dinosaur (0.5) Ye.hh (0.8) but think you

13 (1.3) tror du (.) Ki:m han har lyst til at

(1.3) think you (.) Kim he would like to

14 de:l: dinosauren=eller tror du bare han vil

share the dinosaur=or think you just he wants

15 le:g mæ dn selv

to play with it himself

16 Carl: (0.7) Jeg tror bare hanl (0.2) vil le:g °med

(0.7) I think just he'l (0.2) will play with

17 den selv°

it himself

18 Mor: °Okay° hvad siger [han så til Frederik]

Okay what says he then to Frederik

19 →Carl: [Men så ka vi] bare

But then can we just

20 (0.2) si:g at vi (0.3) .hh finder noget (0.8)

(0.2)say that we (0.3) .hh find something(0.8)

21 andet the (0.8)
 else to (0.8)

22 →Mor: Til Frederik
 To Frederik

23 Carl: (0.7) The Frederik og [le:g (0.3) med eller de
 (0.7) To Frederik to play (0.3) with or they
 24 ka le:g? med dinosauren sammen]
 can play with the dinosaur together

25 → [*((Carl går fra bordet*
 Carl steps away from the table

26 *med sin bamse i hånden))*] eller de
 with his teddy bear in hand Or they
 27 finder noget andet at le:g med sa:mm:n
 find something else to play with together

28 Mor: [O::?kay. (0.6) så de kan egentlig vælge]
 Okay (0.6) then they can really choose
 29 nummer ↑et (0.9)
 number one (0.9)

30 → [*((Carl går tilbage til bordet ud af kameraets*
 Carl walks back to the table, out of the angle

31 *vinkel))*]
 of the camera

- 32 Mor: [de kan fin:d nåe andet at le:g med til
they can find something else to play with for
33 Frederik]
Frederik
- 34 [((*Carl leger med bamsen på bordet*)) (1.3)]
Carl plays with the bear on the table (1.3)
- 35 →Mor: Nummer to (1.8) de leger ↑sammen med
Number two (1.8) they play together with
36 dinosaurusen (0.3) de ka lege sammn begge to
the dinosaur (0.3) they can play together both
two
37 med dino[sau]rusn
with the dinosaur
- 38 →Carl: [tre]
three
- 39 →Mor: Eller nummer tre (1.2)
Or number three (1.2)
- 40 Carl: °De finder noget andet .at lege med.°
They find something else to play with
41 ((*Carl tager fat i en bog der ligger på*
Carl grabs the book lieing on
42 *bordet, og bladrer i den*))
the table, and flips through it

- 43 →Mor: =Vi l-Vi lægger dinosaurusen væk? <og starter
We p-We put the dinosaur away and starts
44 en helt ny leg>
a brand new game
- 45 →Carl: (0.4) Ja
(0.4) Yes
- 46 Mor: (0.5) Mmmh?
(0.5) Mmmh
- 47 Carl: =Mor se her? (0.8) ((*Carl bladrer i bogen*))
Mom look here(0.8) *Carl flips through the book*

In Excerpt 25, Mom initiates an adjacency pair, by asking Carl in l. 8-9, what one of them might say to the other. Carl replies after a small pause, applying a second-pair part with a next turn proof procedure. Mom responds by giving her version of, what the second-pair part reply to her initial first-pair part should entail. This indicates that Carl's response was not fulfilling according to Mom, who expects another preference organization. She then proceeds to ask another elaborating first-pair part in l. 11-15, providing Carl with two options for the second-pair part. Carl replies accordingly, choosing the latter option of the boy playing with the dinosaur by himself instead of sharing, as his second-pair part. Mom then proceeds with a new first-pair part question, asking what one of the boys would say to the other. Carl's reply is overlapping Mom's TCU before she provides a specific TRP, which would provide Carl with what syntax he is to use, indicating the first signs of loss of interest (Excerpt 25, l. 19). In this regard, his reply does not hold a solid principle of

contiguity. The second-pair part does not entail a syntax containing a pronoun that indicates Carl as being the voice of one of the boys, but rather his syntax puts him outside of the picture, looking in. He does show proof of next turn procedure, as his reply gives the options of what the boys can choose to do, however when using *you* in plural instead of singular, he positions himself as the narrator, which is not the action expressed by Mom, in her first-pair part in l. 18. However, when he pauses for a relatively long time (0.8 seconds) for the second time in his sentence, Mom interrupts, providing him with the name of the boy *Frederik*, thus indicating to Carl, that he is not speaking fast enough. Carl repeats Mom's repair, but then removing himself mid-sentence (Excerpt 25, l. 25) from the table, they are positioned at. This indicates that he does not favor this interruption from Mom and loses interest. Mom initiates a repair, by trying to get Carl to perform the action of listing the options once more in l. 28-29. She does this, by applying a first-pair part question. This is evident, when she stresses the RTP and using a high pitch, indicating a focus point as well as a question for Carl. Carl shows intersubjectivity by returning to the table in l. 30, but he does not initiate the second-pair part. Mom begins the second-pair part in l. 32 herself, in another attempt of repairing the lost interest, however Carl does not respond but instead plays with his teddy bear on the table. Mom then goes on, providing more of the second-pair part, but pausing for a long time, which should have indicated to Carl that she is giving him the next turn, however, he still does not take the turn. He projects Mom's turn-terminal in l. 38, once again displaying an understanding of the intersubjectivity. Therefore, when Mom for the third time initiates a repair, he succeeds in taking his turn with a next turn proof procedure, when he correctly replies with the third option he provided earlier in l. 19-24. However, his quiet level of tone indicates, that he is still not interested, which is

reinforced as he focuses his attention to a book lying on the table besides him. Mom then takes a turn in l. 43, latching and providing another version of the second-pair part to her initiated adjacency pair in l. 39. This indicates to Carl that although he answers correctly, it is not part of a preference organization held by Mom. He confirms her version with his practice of an indifferent sounding yes in l. 45, as there is no intonation, thus giving the turn back to Mom, indicating a loss of interest. However, Mom is still not satisfied and using a *Mmmh?* (Excerpt 25, l. 46), with a rising intonation at the end, she indicates a question and thereby gives the turn back to Carl once again. Carl does not provide this repair, but rather initiates a new first-pair part, urging Mom to look at a book, thereby indicating to her, that he would rather have her paying attention to, what he is looking at, instead of him paying attention to what she wants him to focus on.

Following is a couple of other excerpts, where Mom takes two turns. These examples are only a couple out of 12 places, where this phenomenon is found. As in Excerpt 25, l. 19-28, the sequence is rather particular. Mom has initiated a few other-repairs in order to regain Carl's attention, however she instead does the opposite, as she each time indicates to him that his reply is not good enough.

Excerpt 26 (T3)

Carl and Mom are Naming Objects and Carl is Busy with Either Playing with a Teddy Bear on The Floor or in His Room. Mom is Struggling to Keep His Attention

4] (0.4) ved du hva det er? ((Mor

(0.4) know you what this is Mom

5 *filmer ovn, og filmer derefter på Carl, der*

films the oven, and films thereafter Carl, who

6 kommer løbende inde fra et værelse))
is running out from his room

7 Carl: (1.2) JA ((Råber fra værelse))
(1.2) Yes Yells from the room

8 Mor: Mm::h? (0.5) Hva er det så?
Mmh (0.5) What is it then

9 → Carl: (0.4).hhhhh (0.3) En: (0.3) møbler ((Smiler
(0.4).hhhhh (0.3) An (0.3) furniture Smiles
10 til mor))
at Mom

11 →Mor: [Ne::j?]
No

12 [((Carl går væk fra mor))]
Carl walks away from Mom

13 →Mor: (0.9) Carl? (1.0) Carl hva er det? (0.6) hva
(0.9) Carl (1.0) Carl what is this (0.6) what
14 hedder sån: e:n
is called such one

15 Carl: (0.5) Møbler
(0.5) Furniture

16 ((Carl går rundt i køkkenet med sin bamse))
Carl walks around the kitchen with his teddy
bear

- 17 Mor: (0.6) Nej (.) hva er det=de:t' ik
 (0.6) No (.) what is it=it's not
- 18 kategorien=>nu ska du si:g de:t' en ovn?< og
 the category= now should you say it's an oven
- 19 hva er kategorien (.) ↑køkken
 and what is the category (.) kitchen

In Excerpt 26 Carl and Mom are going around the house, while Mom is pointing out different items, asking Carl to name the objects. This task is a way to obtain the ability of categorization by telling the names of the objects and what category they belong to. In l. 9 Carl provides a second-pair part to Moms previous question, but she gives the turn back to him once again in l. 11, by dismissing his answer, indicating that she is not satisfied, as his answer is incorrect, while at the same time providing a TRP intonation indicating this as a question. Thus, urging him to try again. Carl turns away from Mom, indicating that he has lost interest. She in turn, asks the same first-pair part question again, and this time selecting him as speaker by name. Carl once again replies with the same second-pair part as before. He repeats his incorrect answer from earlier, and Mom ends up providing the correct reply herself.

Excerpt 27 (T3)

Mom and Carl are Reading a Theory of Mind Story, But Carl is Busy with his Mirror in The Camera Display

- 18 Carl: (0.2) [Nej den der]
(0.2) No that one
- 19 [((Slår hånden ned i bogen de sidder
Hits his hand down on the book that
20 med))]
they are using
- 21 Mor: (0.7) Ja (1.0) den hedder ↑_Gre::the_↑ (0.4)
(0.7) Yes (1.0) It is called Grethe (0.4)
- 22 og Mette. ((Carl kigger ind i kameraet og
and Mette Carl looks in to the camera and
23 laver kysmund, og kigger derefter ned i bogen,
forms his lips like a kiss, and looks
thereafter down at the book
- 24 → der hvor mor peger)) (1.5) Se↑ her (0.7) her
to where Mom point (1.5) Look here (0.7) here
- 25 er Grethe og Mette (5.1) så se her (0.4)
is Grethe and Mette (5.1) the look here (0.4)
- 26 → [Carl er du klar]
Carl are you ready
- 27 → [((Carl kigger væk, og rykker sig lidt væk fra
Carl looks away, and moves a little away from
28 mor))]
Mom

- 29 Mor: (0.2) <Grethe ska til at ringe med klokken>
 (0.2) Grethe is going to ring the bell
- 30 ((Carl tager fat i en dukke, som han sidder
 Carl grabs a doll, that he then is holding
- 31 med imens han kigger ind i kameraet))
 while he looks into the camera
- 32 → Prøvoghør-prøvoghør her=kig li' på mig
 Trytolisten-trytolisten here=look just at me
- 33 Carl: (0.2) Ja
 (0.2) Yes
- 34 ((Kigger ind i kameraet, kigger op på mor, og
 Looks in to the camera, look up at Mom, and
- 35 kigger derefter ind i kameraet igen))
 looks thereafter in to the camera again
- 36 →Mor: (2.2) [Prøvoghør=hvis du skal være mæ
 (2.2) Trytolisten=if you are going to
- 37 the at la:v den her <Hvem Ved Hvad>]
 join to do this here Who Knows What
- 38 [((Carl kigger fortsat ind i kameraet
 Carl is still looking in to the camera
- 39 imens mor snakker))]
 while Mom is talking

40 → Mor: [HEY]

Hey

41 → [((Mor rører Carl på kinden, der stadig kigger
 Mom touches Carl on the cheek, who is still
 42 ind i kameraet))]
 looking in to the camera

The same thing happens in Excerpt 27, l. 18, Carl choses the story, thinking it is enough, thus focusing on the camera instead. Mom confirms, but when realizing he is not looking, she implements a string of other-initiated repairs (Excerpt 27, l. 24-26), in order to redirect Carl's visual attention to the task. She asks him in l. 26, if he is ready, however he does not reply, indicating to Mom that he is not paying attention. This indicates a loss of intersubjectivity and principle of contiguity as there is no next turn proof procedure, since he does not take the turn selected for him by name. Mom then self-selects and continue her turn, with several more initiated other-repairs in l. 32, 36, 40, and 41.

Mom takes two turns again in Excerpt 28, however in l. 7, he takes his turn, but it has no principle of contiguity, since he does not reply to Mom's initiated adjacency pair, rather he engages in the conversation, by selecting Rita as the receiver of his turn. Mom tries to repair by repeating her question, but Carl still does not answer. She then self-selects again, by moving on to the next item in the game being played.

Excerpt 28 (T10)

When Playing a Game, Carl has Been Reprimanded, as He Would Take Rita's Turn.

He Has Now Changed the Interruption to a Helping Hand

6 → Mor: (0.2) Hjælper du hende.

(0.2) Help you her

7 → Carl: (0.7) Der er[↑] den Rita ((*Står op på stolen og*

(0.7) Here is it Rita *Stand up on the chair*

8 *bøjer sig ind over bordet*))

and bends over the table

9 → Mor: (1.1) Hjælper du hende Carl?

(1.1) Help you her Carl

10 ((*Carl svarer ikke mor, men fortsætter med at*

Carl does not respond to Mom, but continues to

11 *stå ind over bordet. Sætter sig ned*))

bend over the table. Sits down again

12 → Mor: (6.5) Mmhu (1.6) her? er der=Carl >så det din

(6.5) mmhu (1.6) here there is=Carl now it's

your

13 tur<=her er der en frø[↑]

turn=here is there a frog

Summarizing, our results show, that in spite of the many repairs, Carl's attention starts to slip, when Mom does not accept his second-pair part to her first-pair part questions, as she continues to give the turn back to Carl. When she initiates

several other-repairs, she only gets a respond when she herself takes the turn, thus skipping his turn. This results in Carl momentarily paying attention, but it is not a lasting repair, as he has already engaged in the focus of things more interesting to him. This indicates that in order to hold his attention, Mom cannot engage in a specific preference organization of second-pair part. In order to keep his attention, she needs to secure his vision on the task, and then engage in a repair of the contiguity.

Learning and Directions

In the theme meaning making one subject appeared as relevant to communication in a learning situation. This section relates to when Carl is learning something during the assignments, which is indicated by his explanations. When Carl's action is to do an explanation in relation to learning, different sequences play out in the interaction. These sequences are relevant, because they display how Carl is learning by revealing the process he goes through and what outcome the process have. Four examples can be drawn from when Mom and Carl are doing a picture task related to the ability to do categorization or the task of finding the odd one out and explain why the picture does not fit the rest.

In this first excerpt, Carl and Mom are finding the odd one out. Carl has to answer Mom, which picture does not go with the rest between a bee, a mousetrap, a piece of cheese and a mouse. Carl has to point out a picture and explain the reason why he chose that exact one. His action in this turn should therefore be an ability to understand the differences and connections between the pictures, and answer Mom correctly.

Excerpt 29 (T12)

When Solving the Task of Finding the Odd One Out, Mom is Not satisfied With the Answer Provided by Carl. She Moves on, When They Have Reached Mom's Preference of a Correct Answer

7 Mor: Mmh? hvorfor?

Mmh Why

8 → Carl: (0.9) Fordi (.) musen de plejer at <spise.>

(0.9) Because (.) the mouse they usually eat

9 (1.2) .hhh (0.3) [ost?]

(1.2) .hhh (0.3) cheese

10 [((Peger på opgaven med

Points to the task with

11 kuglepen))]

the pen

12 Mor: (0.3) Ja?

(0.3) yes

13 → Carl: =Og: (0.2) >°Hva er det?°< ((Peger på et af

=And (0.2) What is this *Points to one of*

14 *billederne*))

15 Mor: (0.7) Det er en musefælde?

(0.7) It is a mouse trap

16 Carl: (0.4) En musefælde (.) og? (0.5) et ost (0.4)

(0.4) A mouse trap (.)and (0.5)an cheese (0.4)

17 men bien passer ik' den bo.hher ikke i et

but the bee fits not it li.hhves not in an

18 mu:sefæl:d (.) og spiser (0.2) ((*Peger med*
mouse trap (.) and eats (0.2) *Points with*
19 *kuglepen*)) ost
pen Cheese

20 →Mor: (0.6) Nej det er rigt=nej ved du hvordan det
(0.6) No that is corr= no know you how it
21 hænger sammen
connects together

22 →Carl: =Ja
Yes

23 ((*Carl klikker med kuglepen hurtigt*))
Carl clicks with the pen rapidly

24 Mor: (1.8) Inde? i en musefælde der ka man [læg et
(1.8) Inside in the mousetrap there can one put
25 styk ost]
a piece of cheese

26 [((*Mor*
Mom
27 *peger på papir*))] (.) og så går musen ind
points to papir (.) and then goes the mouse in
28 (0.3) og henter osten og så
(0.3) and gets the cheese and then

29 sir den (.) [ban:g]
 says it (.) bang
 30 [((Mor slår i bordet))] (0.3) så
 Mom hits the table (0.3) then
 31 fanger fæ:lden: (0.4) °den fanger musen° (0.6)
 catches the trap(0.4)it catches the mouse(0.6)
 32 [men (0.7) bien den går ik i °musefælden°
 but (0.7)the bee it goes not in the mouse trap
 33 ((Mor siger trutlyd))]
 Mom makes a pouting sound
 34 [((Carl står og stirrer ud i luften imens han
 Carl is standing staring into the air while he
 35 *hører mors forklaring))]*
 is listening to Mom's explanation
 36 →Carl: (0.4) [Hvad?]
 (0.4) What
 37 [((Carl stirrer fortsat ud i luften))]
 Carl continues to stare into the air
 38 Mor: (0.6) [Bien den går ik' ind i en °musefælde og
 (0.6)The bee it goes not into a mouse trap and
 39 spiser ost (.) det kun ?musen der gør det°]
 eats cheese (.) it's only the mouse who does
 that

[(4.6) ((Carl stirrer fortsat ud i
(4.6) Carl continues to stare into
luften, da mor forklarer det igen))]
the air, when Mom explains again

Mor: Huh [huhmmh] ((Griner))
Huh huhmmh Laughs

→Carl: [Okay]
Okay

Mor: .hh £Carl det var godt (0.3) så må du sætte
.hh Carl that was good (0.3) then can you put
et£ ↑kryds:
a mark

→Carl: (0.3) Ja fordi (0.2) at (.) bier de blir .hhh
(0.3) Yes because (0.2) that (.) bees they
become .hhh
(.) de la:jver kun hon- (0.2) .hhh honning så
(.) they make inly hon- (0.2) .hhh honny so
det så:n de ka ?spi:se °det°
it's then they can eat it

→Mor: Det ↑li præcis rigtig Carl .hh (.) så (0.2)
That just exactly right Carl .hh (.)then (0.2)
taer du og sætter en ring rundt om næste
go you and put a circle around the next

51 opgave .
 assignment

Mom asks, in l. 7, why the bee does not fit in, referring to a previous gesture Carl did, pointing to the bee with a pen on the assignment paper. Carl begins to explain that the mouse usually eats cheese. Thus, he is fulfilling a next turn proof procedure by answering Mom's question. Mom replies in her next turn with a *Ja?* (*Yes?*; Excerpt 29, l. 12) with a high intonation in the end of the word, making it a question, which indicates that she is not satisfied with his answer in l. 7-9 and wants Carl to tell more. To be able to fulfill the assignment in this sequence, Carl makes a parenthesizing repair, where he points to the picture of the mousetrap, asking Mom what it is. This shows that Carl knows that he has to relate all four pictures, and therefore needs to know what it is. Mom answers that it is a mousetrap. Carl provides his explanation of the pictures relatedness, but Mom responds with an attempt of an other-initiated self-repair, as she begins her TCU with the dismissive *nej* (*no*), and she indicates the end of the TCU with a syntax, formulating the TCU as a question, asking *ved du* (*do you know*) (Excerpt 29, l. 20-21). This indicates that Carl has failed to understand the preference organization, that Mom is expecting in this particular learning situation. Carl implements his practice =*Ja* (*Yes*; Excerpt 29, l. 22), which latches on Mum's prior turn, indicating that he has tried multiple times to provide an answer, which all where not satisfying, so he wants her to provide an answer. Mom's next turn begins with a long pause, that supposedly should have been a TRP in her prior turn, making room for Carl to answer the question. When Carl does not take a new turn and make the repair, Mom is trying to promote, Mom provides an other-initiated other-repair, as she takes a turn explaining the connection

Excerpt 30 (T18)

6 → Carl: [[KOEN DEN] SEJLER I VANDE:T]

7 [((Carl slår på papir))]

8 → Mor: (0.3) Ved du hva jeg tror den gør?

(0.3) Know you what I think it does

9 → Carl: =Ja

Yes

10 Mor: =Jeg tror den .svømmer

I think it swims

11 →Carl: =Ja

Yes

12 →Mor: (1.2) Ik? (1.2) Prøv o' sig det (0.2) prøv o'

(1.2) right (1.2) Try to say that (0.2) try to

13 sig (0.2) koen °svømmer°

say (0.2) the cow swims

14 →Carl: (0.5) Du ska: (0.9) du svømme men det? ska du

(0.5) You should (0.9) you to swim but it

should you

15 ik (.) du ska kun=det er jo kun (0.5) .hh

not (.) you should just=it is really just

(0.5) .hh

16 ↑hajer der skal svømme ko:

sharks that shuld swim cow

17 Mor: (0.5) Ja det er rigtig ↑hajer og fis:k (0.4)

(0.5) Yes that is right sharks and fish (0.4)

18 [.hhja hvor] ska koen hen

.hhyes where does the cow go

In Excerpt 30, Carl and Mom are doing the picture task, where Carl needs to point out what is wrong and how to correct it. Carl is yelling *KOEN DEN SEJLER I VANDE:T* (*The cow it sails in the water*; Excerpt 30, l. 6) and slaps the assignment paper. Mom initiates a first pair-part, with an other-initiated other-repair and a high intonation in TRP of the TCU, which indicates a trouble in the interaction and an attempt to repair the trouble, because his explanation is not correct. Carl uses his next turn to provide his practice, *yes*, indicating to Mom, that she should explain, what she thinks (Excerpt 30, l. 9). Mom understands the use of Carl's practice, and answers *=Jeg tror den .svømmer* (*I think it is swimming*; Excerpt 30, l. 10). In his next turn Carl's TCU is the same practice, *yes*. Mom is aware that this practice is not a second-pair part answer to her first-pair part, and that the practice is not indicating a confirmation, that Carl has understood her new explanation. In Mom's next turn she begins with a long pause and a question to get a confirmation *Ik?* (*Right*; Excerpt 30, l. 12-13) proceeding with another long pause and then asks Carl to say, that the cow is swimming. Mom therefore uses her turn to get confirmation and facilitates a learning process by implementing an other-initiated other-repair, where the goal is to make Carl repeats her explanation to foster a new understanding for him. Carl's next turn includes next turn proof procedure, since he is talking to the objects in the picture, as he is supposed to do in the assignment. He makes a new explanation for the picture, by saying that the cow is swimming, but it is not supposed to do so, while it is fish and sharks, which are supposed to swim. Mom answers the prior turn with confirming the new explanation by saying *Ja det er rigtig ↑hajer og fis:k* (*Yes that is right sharks and fish*; Excerpt 30, l. 17). This last adjacency pair of the sequence indicates that the trouble is no longer present in the interaction and that a

proper interaction is restored, which displays that Carl has learned something new, which also meets the preferred organization of Mom.

Excerpt 31 is another example from the picture task.

Excerpt 31 (T17)

Carl and Mom are Looking at a Cartoon Figure of a Girl Walking on Water

- 1 Mor: Rigtig↑ godt Carl=hva mæ ↑pi:gen
Right good Carl what about the girl
- 2 → Carl: (0.5) Ø-ø:h (0.8) hun ↑går i vandet↑
(0.5) U-uh (0.8) she walks in the water
- 3 Mor: (0.5) Går hun (.) ovenpå vand:t.
(0.5) Walks she (.) on top of the water
- 4 Carl: =Ja
Yes
- 5 → Mor: Mh (.) ka man godt [det?]
Mh (.) can one really that
- 6 Carl: [Du] ska ↑ik' (0.7) gå
You should not (0.7) walk
- 7 ovenpå vandet=du ska' (0.2) gå (1.0) der ska
on top of the water you should (0.2)walk (1.0)
there should
- 8 du svømme og du ska (0.3) gå (1.0) og du ska
you swim and you should (0.3) walk (1.0) and
you should

- 9 ↑gå på gulvet men det fordi moar når .hh man
walk on the floor but that because mommy when
.hh one
- 10 går (0.2) på noget vand så ka' man ?falde
walks (0.2) on some water then can one fall
- 11 mo::[ar]
mommy
- 12 →Mor: [Så] ka man fal:d ned i vandet [og]
Then can one fall down into the water and
- 13 dr:ukne.
drown

In l. 1 Mom is asking Carl a question regarding the picture they are looking at making a first-pair part of an adjacency pair in the beginning of the sequence. Carl understands his next turn making the next turn proof procedure present by answering Ø-ø:h (0.8) hun ↑går i vandet↑ (U-uh (0.8) She walks in the water; Excerpt 31, l. 2). In Moms next turn she is implementing an other-initiated other-repair trying to repair the trouble in Carl's prior turn. This indicates that what Carl is saying is not correct, and by saying that the girl is walking on the water and stressing ovenpå (on top; Excerpt 31, l. 3), Mom is stating the correction. In Carl's next turn the TCU is the practice, yes, which indicates to Mom to specify, what she means. Mom elaborates by asking if it is possible to walk on water, initiating a first-pair part, indicating that she understood the means of Carl's practice (Excerpt 31, l. 5). Carl then makes an explanation regarding that the girl should not walk on the water, but

instead she should swim, and gives her direction of that walking is best done on the floor. This is a second-pair part to Mom's prior turn and also next turn proof procedure, since he answers the question. Mom's next turns indicates that Carl understood her expectation and thereby preferred organization, as she repeats his answer, thereby confirming that it is correct. Mom elaborates her confirmation by including the consequence, that it is possible to drown if you trip and fall (Excerpt 31, l. 12). This example is a bit different from the previous two, since the sequence is indicating that Carl knew the correct answer, but he needed guidance from Mom's repairs to provide the explanation. This indicates that the particular assignment was not obvious to him. The learning part is therefore showed in the way Carl is guided to complete the assignment by Mom.

Our results are indicative of learning taking place, since Carl is able to correct his explanations with directions from Mom. The process in these sequences shows how Mom is able to direct Carl by implementing repairs in her turn, first, to indicate to Carl that the explanation is not correct, and secondly, to facilitate the process of making a new explanation and thereby learning what is correct.

Repetitive Gestures

When Carl communicates, there seems to be certain situations that trigger him into doing repetitive gestures such as knocking or tapping on the table or paper or waving his hands about in certain ways. These situations in particular arise when he seems to want to keep his turn. Consider Excerpt 32 below.

- 10 (0.4) og dreng du skal (0.2) .hh (0.3) du? ska
(0.4) and boy you should (0.2) .hh (0.3) you
should
- 11 (1.0) ta' brysterne af og (0.2) gi dem til en
(1.0) take the breasts off and (0.2) give them
to a
- 12 pig' [og ?gaffel du skal være (0.2) i
girl and fork you should be (0.2) in
- 13 tallerknen]]
the plate
- 14 Mor: [Mmh]
Mmh
- 15 [°hehehehahaha° ((Griner))]
hehehehahaha Laughs
- 16 £Ja (0.5) så:dan Carl=du' mega sej (.) give me
Yes (0.5) Great Carl=you're really good (.)
give me
- 17 five£ ((Carl klapper mors rejste hånd i en
five Carl claps Mom's raised hand in a
high-five-gestus)) [Tak]
hive-five gesture Thanks
- 19 →Carl: [Så] (.) det den ?sids:te
Then (.) it's the last one
- 20 ((Bladrer side))

Flips the page

21 →Mor: =Så tar vi den ↑sidste (2.5) jaer?

So do we the last one (2.5) Yeah

22 →Carl: (1.7) [På det der billed (.) der (0.7) s:ke:r]

(1.7) On this here picture(.)there(0.7)happens

23 [(*Klapper med flad venstre hånd én gang*

Slaps with a flat hand once

24 *i papiret))*]

on the paper

25 (0.4) der at [(*Klapper igen med flad venstre*

(0.4) there that Slaps again with a flat left

26 *hånd))]*

hand

27 [krokodillen] .hh er (.)

the crocodile .hh is (.)

28 [(*Banker hurtigt med*

Knocks rapidly with

29 *siden af knyttet venstre hånd i bordet))]*

the side of a knuckled hand on the table

30 [inde her mo:ar?]

in here mommy

- 31 Mor: [EJ (0.2) kroko]
 No (0.2) the croco
- 32 dillen stikker sit hov:ed? (0.2) ind (0.5) af
 dile sticks its head (0.2) inside (0.5) of
- 33 vi:nduet
 window
- 34 Carl: [((*Carl banker med pegefinger ned i papiret*))]
*Carl knocks with the index finger down on the
 paper*

In this excerpt Mom and Carl are solving the task of identifying what is wrong in the picture. Mom asks Carl in a high pitch, to tell the fish in the picture, what it is doing wrong. In replying to Mom's adjacency pair of direction and complying, Mom intends for Carl to only tell the fish, what it is doing wrong. However, Carl shows a lack of contiguity principle as he begins to tell all the pictures, what they are doing wrong (Excerpt 32, l. 5-14). However, there is an intersubjectivity present, as he is giving a correctional direction to all the characters out of place in the drawing. In doing so, he repairs the preference organization of this rigid sequence displayed by Mom throughout video 008. He indicates to Mom that he can project her usually following questions, where she asks him to tell the particular character, what it is doing wrong, as displayed in l. 1. He also indicates to Mom that he can project the future questions of directing the characters. This shows an immense understanding of the intersubjectivity and sequence structure of the task. When performing such a long turn of directing the characters, he implements a large amount of self-repairs, such as pauses, breaths and searching for the words. The last

is indicated by the repetition of the last words before pausing such as (0.4) *du* (0.3) *ss* (0.2) *og* (.) *du ska* ((0.4) *you* (0.3) *ss* (0.2) *and* (.) *you should*; Excerpt 32, l. 6-7), and the replacing of words saying *og mand du* (0.4) *og dreng du skal* (*and man you* (0.4) *and boy you should*; Excerpt 32, l. 9-10). These self-repairs indicate to Mom an eagerness of wanting to keep his turn, in order to project the understanding of the intersubjectivity. Alongside this extended turn, he keeps tapping with his forefinger and flat hand interchangeably. Mom laughs and praises him for such a good answer both verbally and asking for a high five, which Carl proceeds to give her. Carl then projects Mom's TRP shown by the high five gesture, while proceeding to initiate a turn terminal in l. 19, self-selecting the next turn. He then flips the page, while framing that this is the last page with pictures. The turn terminal and flipping page indicates to Mom that he is ready to proceed to the next task. Mom latches and repeats his framing, but ends with a questioning *jaer?* (*yeah*; Excerpt 32, l. 21), giving the turn back to Carl, as well as indicating to him that she is also ready, and she is expecting him to be able to understand the intersubjectivity of what this first-pair part question means. Carl understands the action prompted by Mom, without her giving instructions, as he provides a second-pair part projecting a next turn proof procedure, as if Mom had asked him, what is happening in the picture. This shows that he has understood the sequence of the task at hand by now, as he is able to provide the preference organization as a general rule, by not having to have Mom ask leading and sequence rigid questions. However, once again he initiates a tapping with his hand while applying the second-pair part in l. 22-30. He also initiates delaying and silence repairs in order to keep his turn. The tapping gesture only appears when Carl performs a several delaying repairs, but also ends, as he ends his turns, indicating that this too is a kind of self-repair initiated in order to keep his turn.

This kind of repair appears in an amount of thirteen instances, but below is provided a few more examples:

Excerpt 33 (T33)

Carl and Mom are Looking at Cartoon Figures, Where an Owl is Placed on the Ground and a Hare is Placed in a Tree

- 1 Mor: Ja hva sker der på det bille:d
Yes what happens there on that picture
- 2 → Carl: ↑_U:gle:n (.) den .hh (0.4) er i:ng (0.5) i et
The owl (.) it .hh (0.4) is inside (0.5) in a
- 3 hul: ↑
hole
- 4 Mor: [Mmhmh?] (1.5)
Mmhmh (1.5)
- 5 [((Carl banker to gange langsomt med flad
Carl knocks twice slowly with flat
- 6 hånd, og to gange mere lidt lettere))]
hand, and twice a little lighter
- 7 Og ska uflen vær i et ↑hul (.) [eller ska
And should the owl be in a hole (.) or should
- 8 uflen være i et træ]
the owl be in a tree
- 9 [((Carl banker
Carl knocks

10 *tre gange i bordet med flad hånd))]*
 three times in the table with flat hand

11 Carl: (0.3) I et træ
 (0.3) In a tree

12 Mor: (0.5) [Okay? og hvad mø: haren?]
 (0.5) Okay and what about the hare

13 [[*((Carl banker med flad venstre hånd to*
 Carl knocks using a flat left hand
14 *gange))*]]
 twice

15 → Carl: (0.5) [Ø:h den er oppe]
 (0.5) Uh it is up

16 i ?træjet
 in the tree

17 [[*((Carl banker én gang og peger to gange*
 Carl knocks once and point twice with
18 → *med venstre pegefinger på haren på papiret)))*
 the left index finger on the hare on the paper

19 Mor: (0.4) Mmhmh?
 (0.4) Mmhmh?

Excerpt 34 (T34)

*Mom and Carl are Looking at a Cartoon Figure of a Candle in a Tree and a Man
Looking up at it. Carl is Expressing Delaying Repairs*

- 5 Mor: =I vindueskarmen=det nemlig? rigtig Carl.
 In the windowsill=that's exactly right Carl
- 6 (1.5) [så (0.2) <derfor> (0.5) så sier du]
 (1.5) so (0.2) therefore (0.5) then say you
- 7 [((Carl banker i bordet seks gange og
Carl knocks on the table six times and
- 8 *tager fat i legetøj ved siden af sig))]
*grabs a toy lying next to him**
- 9 li:↑ til [ham manden]
 just to him the man
- 10 [((Peger på manden))]
Points to the man
- 11 at han ska ta sit lys ned fra træet.
 that he should take his candle down from the
 tree
- 12 →Carl: (0.3) .hh [du ska ta dit (.) li- .hh lys (0.2)
 (0.3) .hh you should take your (.) ci- .hh
 candle (0.2)
- 13 <ned fra træet.>]
 down from the tree
- 14 → [((Banker flere gange slapt på
Knocks many times loosely on

15 *papiRET og to gange med flad hånd))]*
 the paper and twice more with flat hand

In Excerpt 33, l. 2 during the picture task, Carl performs a TCU containing multiple silence repairs indicated by small pauses throughout his turn. This turn is a second-pair part reply to Mom's first pair-part in l. 1. While providing the second-pair part he starts to tap his hand on the table again and does not end the tapping until he ends his later turn in l. 15. In Excerpt 34, the same phenomenon is seen in l. 12-15. The tapping begins as he initiates his turn, which contains multiple self-repairs, and once again ends, when he ends his turn.

Another indication of the tapping as a repair designed by Carl in order to keep his turn, is transparent when he is overlapped in his turn by Rita. Consider Excerpt 35, where Mom and Carl are doing the picture task. They are positioned at the same side of the table, and Rita is sitting on the opposite side of Mom from Carl.

Excerpt 35 (T29)

Mom and Carl is Solving a Task of a Cartoon Showing a Girl Who Puts a Car into a Pram, and Rita Overlaps to Join the Assignment of Solving the Task

1 Carl: ↑_Hvad SKER der på den næste mo:ar_↑
 What happens there on the next mommy

2 Mor: (0.6) [På den næste tegning]
 (0.6) On the next cartoon

3 → Rita: [(bar fos du:kke]vogn me (0.4) [og
 bar fos doll pram with (0.4) and

4 passe på dn)]

take care of it

5 → Carl: [Hun

She

6 ligger] (0.3) [en (.) ↑bil ned moar]

puts (0.3) a (.) car down mommy

7 [((Begynder at klappe på

Starts to slap the paper

8 *papiret med først en flad pegefinger og så*

firstly with a flat index finger and then

9 *hele hånden tre gange*))]

the entire hand three times

10 → Mor: (0.2) Jha hun [ligger en bil i barnevognen]

(0.2) Yhes she puts a car down in the pram

11 → Rita: [(Og en vossen dukkevo:gn)]

and a vossen baby carriage

12 Mor: (0.3) <Jamn hører en bil til i barnevognen?>

(0.3) But belongs a car to in the pram

13 Carl: =E:j?

No

14 Mor: Nej hvad hører der til?

No what belongs there to

15 → Carl: (0.4) øh

(0.4) uh

16 →Rita: (0.3) >bøh< (.) [DUKKE:]

(0.3) boo (.) doll

17 →Carl: [En bæibi] (0.3) DU [SKA]

A baby (0.3) you should

18 Mor: [en]

a

19 [bæibi]

baby

20 Carl: IKKE [TA EN BIL NED ((*Klapper to gange. En med*

not put a carl down Slaps twice. One with

21 *pegefinger og en med flad hånd*))]

index finger and one with flat hand

22 du [ska FINDE]

you should find

23 Rita: [DUKKE:::]

Doll

24 Carl: Du skal finde [en bæibi]

You should find a baby

25 Mor: [en dukke ((*Kameraet filmer på*

a doll The camera film

26 Rita))]

Rita

27 Carl: Som d- .hh du ka putte ned.

That yo- .hh you can put down

This excerpt involves the same picture task as mentioned in the previous section. In this excerpt Carl completes a TCU as a first-pair part question, asking Mom what is happening in the picture, yelling the word *SKER* (*happens*; Excerpt 35, l. 1), indicating to Mom that he wants her to indicate how to proceed with this task. After a small pause, Mom begins her turn, but Rita turn-initiates in l. 3 at the same time, overlapping Mom, which causes Mom to abort her own turn in l. 2. Rita continues her turn, but Carl begins his turn mid-turn of Rita's, indicating that he finds her explanation of the drawing incomplete. He provides his own second-pair part in l. 5-6, to his own first-pair part in l. 1, as he says that the girl is putting a car in the baby carriage. While performing this turn, he initiates a repair in order to keep his turn, by tapping the paper with first his forefinger, but then continues with the whole of his hand, which ends, when he ends his turn. Mom confirms his answer as being correct but is interrupted mid-turn by Rita. After a short pause, Mom takes another turn, asking slowly if the car belongs in the baby carriage. Carl projects her rising intonation at the end of the last word, indicated by him latching, and giving the turn back to Mom, as he rises in intonation at the end of his dismissive =E:j? (*No*; Excerpt 35, l. 13). Mom proceeds to ask, what should be put in there (the baby carriage) instead. Carl initiates his turn in l. 15 with a short pause and an *øh* (*uh*), which as mentioned above, only indicates a turn-allocation, if his pause is extraordinarily long. However, Rita self-selects the turn, and proceeds to provide the second-pair part to Mom's question. As she does this, Carl also replies to Mom's first-pair part in l. 14, proceeding in l. 17 to yell the directional reply of what the

character should do instead. Mid-turn Mom confirms Carl's reply, causing him to initiate a repair of tapping his hand, in order for him to keep his turn (Excerpt 35, l. 19-21). Once again, the tapping ends with Carl ending his turn. The same kind of interrupting triggering of the repair of tapping is found in a total of eight times, all with Rita being the interrupting or overlapping speaker. Below is given two more examples.

Excerpt 36 (T31)

While Looking at a Cartoon Figure of a Man in a Boat with a Suit on, Rita Overlaps Carls Reply

4 Rita: [Narj]

No

5 Carl: [Nej?] (0.5) ↑_ham her han har tøj på_↑

No (0.5) him here he has clothes on

6 Mor: (1.1) ↓Ghuud (0.5) han har jakkesæt og hat

(1.1) God (0.5) he has suit and hat

7 Carl: (0.3) Ja

(0.3) Yes

8 Mor: Har man det når man sejler?

Has one that when one sails

9 Carl: (0.3) Ja (0.3) [ne:j]

(0.3) Yes (0.3) No

10 [((Højre arm hviler på bordet,
Right arm rests on the table,

11 *men han begynder at vifte med sin pegefinger*
but he starts to wave with his index finger

12 *sidelæns frem og tilbage))]*

 sideways

13 Mor: (0.2) Hvad har man så på?
(0.2) What has one then on

```
14 →Carl: (0.6) Øh (0.3) .hh [regntøj]
      (0.6) Uh (0.3) .hh rainwear
```

```
15 →Rita:                                [regntøj]
                                           rainwear
```

16 Mor: Regntøj det rigtig=hvor er ↑_i altså dygtige i
Rainwear that's right=how are you just good
you

```
17      to_↑
        two
```

18 →Carl: =Og (0.2) [og va-
And (0.2) and Wa-

19 [((*Klapper en gang pegefinger*))]

Taps once with his indexfinger

20 [↑_og tøjet] det kommer ned i vanded._↑
and the clothes it comes down in the water

21 [((Klapper to gange med flad hånd ned i
Slaps twice with a flat hand down on

22 papiret))]
the paper

Excerpt 37 (T39)

Carl, Mom and Rita are Playing a Game Placing Animal Pictures on a Board. Carl Is Starting a Song Related to a Bee and Rita Overlaps

2 Rita: (1.7) (Her er der)
(1.7) Here is there

3 → Carl: =DER↑ (1.8) Sum-bi (0.3) .hh [Zum: zum: zum:
There (1.8) zum-bee (0.3) .hh Zum zum zum

4 ((Synger, mens han ryster hovedet, og begynder
Sings, while he shakes his head, and begins
5 at klaske hånden i bordet))]
to slap his hand to the table

6 → Rita: [(Rita mumler
Rita mumbles
7 noget uhørligt))]]
something inaudible

8 Carl: [Zum: zum: zum: ((Synger videre))]
 Zum zum zum Keeps singing

9 Mor: [Ja]
 Yes

10 Carl: .hh [vi ska u' på su-umbi↑ ((Synger og klapper
 .hh we go out on zu-umbee Sings and slaps
 lidt hårdere i bordet))]
 the table a little harder

In Excerpt 36 l. 14-15 Carl and Rita overlaps, causing Carl to begin the repair of tapping, in order to make sure, he keeps his next turn, which is initiated in l. 18, after an appraisal from Mom to both of them. The turn latches on Mom's turn and is a continue elaboration on his firstly provides second-pair part overlapping Rita's identical second-pair part. In Excerpt 37, l. 6 Rita once again overlaps Carl's singing turn, causing him to slap his hand loudly down on the table. It is not until he is done singing in l. 19 (Appendix 3, T39) that he stops slapping his hand on the table.

The analysis of Carl's tapping gestures shows that he only implements them when he is either initiating an extraordinarily number of other-repairs in TCU or is overlapped by his sister, when speaking, indicating that he is trying to keep his turn. This is supported by the ending of the tapping, as soon as he ends his turn. An understanding of this unique repair, can help provide a better understanding of how Carl communicates. In addition, Mum not being distracted by his tapping, but instead lets him finish his turn, indicates an intersubjective understanding from Mom, which provides a perspective of how this communication is thus successful, and not causing an interruption of the progressivity of the interaction.

Discussion

Research show, that children with ASD have alternative ways of engaging in communicating, which is relevant in relation to learning. The aim of present study was to investigate how mutual understanding is achieved through interaction in learning situations with a child with ASD, in order to rethink communication and attempt to provide a new perspective in this particular field of research. When approaching this topic, we gathered videos of one child interacting with his mother in an ABA setting at home. The boy, Carl was five and six years old, when the videos were recorded, and he was clinically diagnosed with childhood autism at the age of three. Investigation of the data was conducted through CA, which contains action in verbal interaction, providing a way of examining what happens during a conversation between the boy and his mother.

Through analyzing the data, we found that the presence of rigid preference organization often displays a negative influence on the interaction between child and mother, since it appeared confusing and misleading for the interpretation the child performed, while interacting with the mother. In relation to missing next turn proof procedure, Carl displayed two different types of responses in order to help promote progressivity. This means, that Carl was able to contribute to a coherent interaction by seeking information, while the mother seemed to have a crucial role in doing so. Carl was using the interjectional word *øh* throughout the data. When analyzed this word had three functions: a) as an initiative of other-repair, when there was a loss of next turn proof procedure, b) as a delaying repair used when particularly engaged or concentrated and c) to allocate his turn, when he could not provide an answer. This displays abilities to engage in mutual communication and abilities to search for more information. Furthermore, Carl implemented his practice using the word *Yes*, though

not as a confirmatory reply, but rather as an indication of a request for more information or when he did not understand what was expected of him, which shows a way of seeking new information. When getting distracted, Carl received help to regain focus through Mom, as she directed his attention to the task at hand and secured that his vision followed. She achieved this by engaging in repair of the contiguity, which indicates ability to allocate attention, when focus is lost. We also found that Carl was able to produce new information through Mom's repairs, when answering incorrectly, which shows an ability to navigate in the presence of intentions and expectations during the learning situation. Lastly, it was found that Carl used tapping gestures as a unique repair trying to keep his turn, when interrupted, or he was initiating an extraordinarily amount of other delaying repairs in a TCU, such as pauses or ϕh 's.

All of these findings display a broad spectrum of varying abilities to engage in communication in a learning situation, although they are alternative and appears atypical. In the following sections the results will be discussed in relation to the body of research described in the introduction and in relation to a classroom learning situation.

Institutional Sequence Structure and Preference Organization

We found that Mom had a specific preference organization, which might influence Carl's learning outcome. This is similar to what Gardner (2013) described as, when in a learning environment, the institutional structures of sequences are often shaped as an initiation by the teacher, followed by a response by the student and closed by an evaluating reply by the teacher. The preference organization by Mom

was also structured in this way, as she initiated by asking Carl a question, which he answered, and afterwards she evaluated either by confirming or dismissing his reply.

This potential rigidity is exhibited in Mom's organization preference, when she sought a certain answer to her question, but failed to acknowledge an alternate, yet correct, answer. When focusing on a specific answer, and this is not applied, it is easy to dismiss the answer as incorrect. As the sequence structure of IRE should enable the teacher to hold attention, the dismissive evaluation leads to the opposite. Our results show, that this was present in Carl's case, in situations, where his answer was alternative, but correctly applied. The dismissal left Carl with a seemingly declining engagement and intersubjective understanding. As he had already provided the answer he believed Mom expected, the continued clues and prompt given by Mom left him lacking the understanding of intersubjectivity. Therefore, the progressivity of the conversation was lost, as Carl might no longer be willing to risk the potential of failure (Sterponi & Fasulo, 2010), by providing an answer, he did not know. When the attention and engagement thus have been lost, the premise of a potential learning outcome may be severely inhibited.

As several findings suggest (Sterponi et al., 2015; Fantasia et al., 2014; Sterponi & Fasulo, 2010, Ochs & Solomon, 2004; Taylor, 2011), children with ASD have a deviating thinking pattern, meaning that the expectations interpreted, and the answers provided by these children, might result in the specific organizations preference expected. Opposite, a structured teaching method has been found to result in a more effective learning outcome (Delf et al., 2014; Young et al., 2016). Therefore, when teaching a child, like Carl, Mom as teacher, might gain a higher learning outcome, if she is aware and sensitive to alternative answers, while attempting to maintain recognizable structure of learning settings and conversational

sequences. As such, the intersubjectivity and progressivity might continue, resulting in a maintained engagement, and through this a better learning outcome. Therefore, the institutional sequence structure, in a learning situation, may provide a recognizable organization of turn-taking, but if the expectation of answers is rigid and locked to a specific formulation, then Carl and his Mom cannot achieve mutual understanding.

Intersubjectivity and Information Seeking

We found, that when Carl and Mom were interacting during the learning situation Carl was not responding with typical confirmed answers of elaboration to Mom's questions.

Carl had a practice using the word *Yes*, not as a confirmatory answer, but rather as an indication of needing more information or when confused by expectations, which shows a way of seeking new information.

First, the findings can be related to the results regarding children with ASD not using information seeking behavior during learning situations, when explanations and instructions goes beyond their capacities (Young et al., 2016). These results could at first hand provide the explanation, that the practice *Yes* is used, as a second pair-part, since Carl then was not able to seek information. In this sense it could be the reason why the practice entails the word *Yes*, which is a confirmatory answer, that are expected in a learning situation, and Carl would therefore be showing engagement and gaining progressivity, even though not being able understand the given information. On the other hand, the results showed, that Carl was gaining more information when he used this practice, because of the intersubjectivity that Carl and Mom shared. The intersubjectivity reveals, that Carl was using the practice as an

initiative to gain more information by Mom, which is implied by her providing more information. Thus, the shared meaning between Carl and Mom makes the practice of *Yes* an alternative way for Carl to seek information. These findings are therefore contradictory to what Young et al. (2016) found, since in this particular setting, Carl is able to seek further information due to the intersubjectivity between him and Mom.

It is likely, that in a classroom setting, there would appear a misunderstanding due to the practice of *Yes* in the communication, since it is atypical by not being a confirmatory answer. Furthermore, even though Carl tries to express the need for help by allocating the turn with his practice, this might not be understood by the teacher, which would have consequences regarding progressivity in the interaction and Carl's learning outcome.

Secondly, the findings can be related to typical use of questions and confirmation. Different actions during everyday verbal interaction requires a confirmatory answer and an elaboration (Steensig & Heinemann, 2013). There are multiple ways of responding to a question; a) it can be either confirmatory or nonconfirmatory, b) it can yield a type-confirming or type-nonconfirming answer and c) the answer can be minimal or non-minimal (Steensig & Heinemann, 2013). When asking a question, there are indications of what type of answer is preferred, and in particular contexts, an answer is preferred to contain more than a confirmatory yes (Steensig & Heinemann, 2013). As a classroom environment entails IRE sequences (Gardner, 2013), it can be argued, that in a learning situation these confirmatory, elaborated answers are preferred, as the initiative questions often entails an elaborative answer, in order to apply an evaluative response. This is exhibited in the way Mom was asking questions and how she replied, when Carl was

not fulfilling the preferred answer, which refers back to the discussion regarding the preference organization. Mom's response to Carl's practice was not a usual IRE response, because the questioner often pursues an elaboration, when not perceiving one (Steensig & Heinemann, 2013), but rather Mom elaborated instead of evaluating. This shows the intersubjective understanding of Carl's practice. Mom understands that it is not a confirmatory yes in the traditional sense, but rather a practice indicating attention and the need for more information, as Carl uses the practice to allocate his turn.

Thus, when Carl used the practice of *Yes*, the requirements for the preferred answer was not met. First, *Yes* did not have the typical confirmatory meaning, and secondly, Carl did not provide an elaboration, which was implied and wanted by Mom's question and by the setting. In the interaction between Carl and Mom, this did not appear as a problem, since the intersubjectivity between them restored the absence of what was expected during the learning situation. Mom understanding this practice, is on one hand positive for their interaction, since it withholds progressivity. On the other hand, this can contribute to problematics, when Carl is not aware of the atypical use if he implements the practice in other learning situations. When approaching from a broader perspective, the *Yes* practice might provide trouble in interaction in a classroom and the respective learning situation. The teacher may not be sharing the intersubjectivity with Carl, that Mom is, and can therefore have difficulties interpreting what is happening, when Carl uses the practice. The teacher might expect that Carl uses *Yes* as a confirmatory reply, which would indicate an understanding of what is being asked, yet it would mean the direct opposite, that Carl either does not understand or has lost interest. Furthermore, any preferred elaboration would not be provided, when the *Yes* practice is used by Carl, which should be

noticed and repaired by the teacher during class, in order for Carl to be able to maintain engagement and attention. Also, the lack of elaboration could be interpreted as something negative, as the seemingly confirmatory reply, indicates a lack of understanding and knowledge in this type of situation, requiring an elaboration and not a confirmation.

Besides this practice, we found that other actions that are brought into the interaction by Carl and Mom, when intersubjectivity was momentarily lost, because Carl did not seem to understand the meaning of Mom's turn or lacked the ability to provide the correct answer. Carl responded with a question initiating a new adjacency pair, which allocated his turn and gave the turn back to Mom. This displayed that Carl was understanding, that he had to provide an answer to Mom, thus understood the basic action expected of him. Reversely, his initiative of a new adjacency pair indicated, that he did not understand how to provide the answer, since he did not understand the meaning of Mom's turn or he was lacking the right answer. In either case, the contiguity was compromised, because the basic structural position was changed by Carl starting a new adjacency pair. This would indicate the loss of next turn proof procedure, which seems to be crucial in a learning situation, since it relates to the presence of a mutual understanding of the information, that is provided. Regarding the missing contiguity, Mom seemed to have a crucial role during the sequences, while providing clues and answers, which were leading Carl to understand, what he was missing during the interaction. It can be argued, that no help provided by Mom would result in complete loss of intersubjectivity, since it seems to be connected with progressivity. This relates to the findings by Sterponi and Fasulo (2010), that also found this connection, when analysing speech exchange between

children with ASD and adults in home settings, thus supporting the results of this study.

In relation to missing next turn proof procedure, Carl seemed to exhibit two different types of responses in order to help promote progressivity, meaning that Carl is able to contribute to a coherent interaction by seeking information, even though Mom still seems to have a crucial role in doing so. Carl's responses might indicate two different meanings, that are not necessarily opposites. On one hand it might be a framing repair, which is also displayed, when Carl was using the interjectional word *øh*, which also appears to have a specific function in relation to the loss of next turn proof procedure, as it is followed by a long pause. This indicates that there is no further speaking in this TCU (Schegloff, 2010), thereby allocating the turn. In both cases the repair is functioning as a way of displaying missing contiguity and a need for more information. This type of response can therefore be interpreted as a kind of information seeking, because Carl was using repair to gain further understanding through Mom, which displayed a search for attaining clarity of the meaning of Mom's question. In this regard, it would seem, that it was not a lack of a correct answer, but rather an indication of obtaining clarity of what was being asked. Carl was therefore attempting to maintain progressivity. This finding is contradictory to the findings of Young et al. (2016), because Carl was exhibiting an ability to seek information through the use of repair, although it was an alternative way of doing so. Therefore, this result does not support the findings that children with ASD, do not engage in information seeking.

On the other hand, Carl's questions revealed a repetition of the questions Mom asked, which relates to the study conducted by Sterponi and Kirby (2015), who found that the reason, why children with autism seem to have trouble displaying the

right use of pronouns, is related to the way the interlocutor are speaking to them.

Thus, children with ASD can have a tendency to copy what is said. This can be related to how Carl was repeating Mom's utterances, when asking questions, which therefore might show that he did not understand the meaning of Mom's question.

Thus, he might not be lacking the correct answer. Alternatively, it can be argued, that typically, when the interlocutor does not understand the action expressed by the speaker, it leads the interlocutor to ask a question of elaboration, containing a variation of the words or phrases used, based on how the interlocutor interprets the action expressed by the speaker. Therefore, it can be argued that Carl would rephrase the questions, showing that he had interpreted it, and needed specific clarification in order to provide the expected answer. When interacting with Mom, Carl was copying the questions as a mechanism to display a lack of understanding yet indicating a desire to withhold progressivity in the interaction. In this relation it would not be a way to seek more information, but instead be a statement of not understanding.

Since the findings reveal, that Carl was able to implement the practice *Yes*, and the use of repair as a way to seek further information, it would seem, that he was able to express himself in a way, that was gaining him more information, thus being able to seek information, when next turn proof procedure was missing. In relation to this it can be argued, that the copying of questions is a way for Carl to underline his missing understanding and is due to the way in which Mom is speaking and her preference organization. Overall, it seems that Carl might have the correct answer, but he was not able to reply, because of not understanding what Mom meant. Also, it seems that even though Carl was experiencing trouble with understanding Mom's actions, he was still participating in the interaction maintaining progressivity, though it appeared in atypical ways, when using repair and copying the questions. This

therefore, becomes an additional argument for atypical ways of information seeking, which indicates that Carl is able to find meaning by using information seeking and through the intersubjectivity embedded in the interaction. Therefore, Carl would be able to sustain communication through repair and copying actions in a classroom setting.

This discussion exposes intersubjectivity as having a connection to progressivity, when communicating with a child with ASD in classroom setting, which indicates that a mutual understanding between teacher and child seems important in order to obtain expected and required answers. Furthermore, the intersubjectivity seems to be related to the possibility of being able to seek information, when information is not understood properly. This is in some way contradictory to what Young et al. (2016) found regarding children with ASD not being able to perform information seeking. This difference in the results can be related to differences in the settings. Young et al. (2016) conducted the study in a classroom, while present data is from videos recorded at home with Mom as a teacher. It would therefore be a challenge for the teacher to promote the kind of intersubjectivity, that is displayed between Carl and Mom, therefore, this would lead to Carl's information seeking not being interpreted as such. Additionally, this relates to the change of perspective suggested by Taylor (2011), who refers to the relevance of interpretation of expectations during learning situations. The change in perspective is possible through acknowledging attitudinal barriers and awareness of the disabilities (Taylor, 2011). This seems to be relevant in this case, since Mom seemed to play an important role for the learning situation by understanding the way Carl interacted, thereby knowing how to provide the proper clues and explanations.

This kind of mutual understand therefore is important to obtain in the classroom, in order to foster a good learning environment for children with ASD.

Repair and Engagement

Our results reveal a distinct use by Carl of the interjectional word *øh* and a repetitive tapping or flipping with hands, as a means of repair in order to keep his turn. *øh* is often used by Carl in the traditional sense, which is as a delay, as it is often followed by a pause in speak (Schegloff, 2010). As Carl implemented *øh* during TCU's, as a repair in order to keep his turn, he indicates engagement towards keeping his turn. This is also true for the results of the function of repetitive gestures, namely as a repair function for keeping the turn. Our study reveals that these seemingly unnoticeable or dismissive actions of repeated tapping or flipping with hands (Dickerson et al., 2007), has the function of repair. The gestures appear when Carl took multiple pauses during his TCU, indicating that the gestures had a likeness to the delaying repair of *øh*, which means that the gestures should not be dismissed, since they have a communicative function. This function being a way of indicating to the interlocutor, that he is actively engaged in the action of his turn and to the task at hand, and that forthcoming talk will be produced (Dickerson et al., 2007). The implementation of communicative repairs, has not been particularly researched in relation to children with ASD and learning, but our results shows that this is an important area of communication with ASD children, as it indicates the level of engagement projected by the child in the conversation. According to Muchetti et al. (2013), engagement is a core deficit in ASD children. However, this must be reconsidered on the premise of the findings of this study, as there are several atypical indicators of engagement, which might have been previously overlooked. Delaying

repairs and repetitive gestures, were unnoticed by the mother, as we asked her to identify any atypical actions such as echolalia or repetitive gestures. Furthermore, previous research listed in this paper have not exhibited focus on this topic, thus potentially neglecting or overlooking the atypical indicators of engagement of the children in question. Yet, engagement has been a topic of several studies, and has been found to further learning outcome, language development and social attention (Muchetti, 2013; Kaale et al., 2014; Jarrold et al., 2013). Muchetti et al. (2013) measured engagement as level of attending, which was defined as eye gaze, interaction with the task and/or verbally/gesturally (pointing) interacting with the instructor. This is a simplified way of looking at gestural interaction in relation to engagement, since the result of this study implies that there might be other ways of looking at engagement.

On one hand, pointing is universally known as a way of engaging and is therefore easier to code and generalize, but on the other hand, if the engagement is shown atypically, thus being dismissed in a traditional point of view, then there might be a margin of error in such traditionally coded studies. Such an error might result in a large generalizability factor, yet not fitting many ASD children. At least not in the case of Carl, and the process of meaning-making behind his actions, which children with similar atypical thought processes might encounter. Additionally, Muchetti (2013) showed, that children with ASD exceeds the general belief that they should be engaged in decontextualized word tasks in order to understand and improve their verbal skills. Her results showed, that by engaging in joint attention activities, such as shared reading, children with ASD could improve story comprehension and activity engagement. This indicates, that when underestimating the capabilities of children with ASD, it is possible that the intentions of achieving a

better understanding of words, the tasks instead hinder the further development of language skills. The children did not exhibit the same level of engagement in tasks beneath their capabilities, then they were in tasks beyond decontextualized literacy tasks, such as shared reading (Muchetti, 2013).

Reversely, Kaale et al. (2014) coded joint engagement as attention to the same object, by the same factors as Muchetti (2013); namely eye gaze and pointing. They implemented joint attention tasks, and were able to increase this skill, but found no effect on language skills or social communication. As the children were able to increase their initiation of joint attention but were not able to increase language or overall social communication skills, it can be speculated, if they only learned to engaged in a normative way of engagement, in order to maintain a progressivity in conversation with the adult. As such, Muchetti (2013) shows how shared attention can result in a better comprehension of what is said, but opposite, Kaale et al. (2014) shows, that this comprehension might only stretch as far as, what is needed in order maintain progressivity. This progressivity is preferred, as it indicates a mutual understanding in order to keep engaged with each other (Sterponi & Kirby, 2015). In this sense, the increased use of repair by Carl when actively engaged, indicates an awareness of the potential of being misunderstood in the expressed actions, and alternatively an expression of a need to be understood to keep progressivity. This becomes even more transparent, as the results indicate, that Carl also engaged in the repetitive gestures of knocking or waving hands, when he was interrupted by overlapping of Mom or his little sister, Rita. This suggested that he was not ready to allocate the turn and was projecting, that there was an intention of forthcoming talk. In the majority of overlapping by the interlocutors, he continued

his turn. As such, he had not, as speaker, allocated the turn willingly, and seemed intent on keeping his turn, until he was satisfied.

All tasks given by Mom were based on joint attention, but when Mom was dismissing his answers, he became less engaged. When Mom elaborated Carl's answers, she indicated to him, that what he had provided was not good enough. However, when she asked elaborating questions, thus engaging him in a shared and joint attention task, he maintained the engagement. He thus indicates this engagement by initiating repairs, projecting that he knows the action expected from Mom. By tapping or using *øh* along with pauses, he projects forthcoming talk, thereby indicating that he is not ready to give up or allocate his turn.

When Carl was not engaged, he did not display joint attention towards the shared tasks. As research show, engagement, and thereby attention, is a premise of an increased learning outcome (Muchetti, 2013; Haebig et al., 2013). As attention is arguably coded by eye gaze (Muchetti, 2013; Kaale et al., 2014), and joint attention fosters increased learning outcome, then Mom's action of directing Carl's attention by eye gaze is supportive of this finding. When Carl did not pay proper attention in coherence with Mom's expectations, she initiated preface repairs, that directed his attention. Our results show, that it was mainly, when Mom directed his gaze, that the repair was achieved, and Carl regain focus. This is, in one way, supported by the findings of Jarrold et al. (2013), as their results imply, that children with autism have difficulties engaging in a task, while orienting towards other participants. However, when only orienting towards the task, the children did not show any social deficits. As Carl regained focus, when oriented towards the task, it implies that he was able to regain attention towards the tasks, but it also implies that he was not able to maintain focus on his own initiative. The explicit structure initiated and maintained by Mom,

seems therefore necessary in order for Carl to regain focus, when lost. On the other hand, directives on behavior was not found to facilitate a better verbal learning outcome (Haebig et al., 2014), meaning that Mom's directive repairs for Carl's attention might hinder his learning outcome. Yet our results show, that the directives given, were successful in repairing Carl's attention to the task, when they were orienting towards his gaze, implying that the results were contradictory to the results of Haebig et al. (2014). Reversely, as only gaze directives worked in Carl's case, it indicates a support of the results of Haebig et al. (2014), as the attention and engagement are the premise of a better learning outcome. In the study by Haebig et al. (2014) study, the directives were oriented towards how the children played with their toys. This did not include attention directive; however, attention is arguably the premise of any interaction the child is orienting and engaging in. These ambivalent results, might therefore be understood, by the categorization of the factors for expressing engagement. Since gaze is commonly accepted as an indicator for engagement and attention (Muchetti, 2013; Kaale et al., 2014), it might explain why this is the only directive working.

Additionally, when Mom takes two turns, she was also directive in how to express the utterances, as she had a specific preference organization of how she expected Carl to respond. When he did not take his turn, since he was not engaged, she provided the answer herself. The lack of engagement might decrease the learning outcome, thus not facilitating any outcome of the language directives, which otherwise have been found to do the opposite (Haebig et al. 2014).

In relation to the explicit structure expressed by Mom, it was also the lack of same, that caused Carl to lose the attention in these specific instances. When Mom dismissed Carl's answers or engaged in self-talk, she was arguably implicitly

excluding him from the shared activity, thereby losing the joint attention that was present earlier in the interaction. In order to achieve joint attention, it is necessary to share the same intentions. In the instances, where Carl was implicitly excluded, it became clear, that the intentions behind their shared activity was no longer the same (Fantasia et al., 2014). Mom's dismissal of the correctly applied answers and the self-talk indicates a change of intentions, as Mom was expecting something else than, what Carl was providing. Furthermore, her initiation of a second turn in a row, also implies a change in intentions, as Carl is no longer engaged, and therefore may not have the intention of taking a turn. Also, Mom might no longer have the intention of repairing Carl's attention, as she took another turn, indicating that the initial intention of a shared activity, becomes an individual activity, thus dissolving the joint attention.

Since joint attention and engagement are important for the learning outcome, the understanding of the expression of engagement is therefore necessary. This engagement is however expressed atypically in Carl's case, implying that in order to better communicate and understand Carl's intentions, so as to maintain contiguity and progressivity and to achieve an intersubjectivity, it is important to account for the intentions of his delaying repairs. Furthermore, he seemed to have a need for an explicit structure and facilitator of this structure, so as to keep attention and engagement, in order to achieve mutual understanding, as well as joint attention, when performing and solving learning tasks. If Carl's intentions or engagement in a learning situation is not understood correctly, and his actions thereby dismissed by Mom, and indirectly a teacher, this might consequently result in a temporary exclusion of Carl in the communication. The exclusion may then result in a loss of

intersubjectivity and engagement, and ultimately finalize in a stagnant learning outcome, as a mutual understanding is not achieved.

Learning and Meaning-Making

We found that Carl was able to produce new information through Mom's repairs, when answering incorrectly, which shows an ability to navigate in the presence of intentions and expectations during the learning situation. Thereby withholding an engagement even though being corrected. These actions of Carl are related to how he is learning during the assignments, which was indicated by his explanations, that were rephrased in ways, where the new information made sense to him. The process occurring in these sequences showed how Mom was able to direct Carl by implementing repairs in her turn, first, to indicate to Carl that the explanation was not correct, and secondly to facilitate a process of making a new explanation and thereby learning what is correct. Thus, supporting, that Mom plays a central role for the ability to learn.

Current result is related to the previous argument in the discussion of intersubjectivity and information seeking, regarding Carl's lacking understanding of Mom's expressed action. When the repeats happened, Carl did not understand what Mom was trying to express. This stands in sharp contrast to current instances, where Carl answers in a different way, which expresses an ability to understand and interpret new information by rephrasing and not repeating what Mom was asking, thus supporting the latter. Furthermore, in these instances Carl was using the practice of *Yes* to gain further information from Mom. The examples are in particular significant, since Carl not only rephrased, but also articulated how the information made sense to him, by providing alternative explanations or including more

information, that goes beyond what Mom had provided. This relates to the description of meaning-making in the introduction, where it is argued that children with ASD might have deviating thought processes compared to neurotypical children, which is exhibited when they interpret and understand information atypically, thus exposing a different set of communication skills.

Parallel to this, are the findings of Muchetti (2013), who studied the influence of engagement and story comprehension. Engagement has an influence on learning, which relates to understanding and next turn proof procedure. It can be argued, that engagement is further related to an understanding of what is happening during the interaction, since these can be viewed as having reciprocal influence. In this case, Carl's understanding exhibits an ability to navigate in the presence of intentions and expectations, thus the ability to gain new information and rephrase it in a way he understands. The results in Muchetti (2013) also display, how teacher guiding has a positive influence on story comprehension and engagement, which seems to relate to the results found in present study, where Carl was able to process the information with directions from Mom, leading to newly attained knowledge. Supporting this relation Haebig et al. (2013) found that parent's language comprehension and verbal responsiveness has an influence on the child's way to acquire language. They found that linguistic inputs followed by attention from the child can be beneficial for children with minimal verbal skills. However advanced inputs would be beneficial in relation to verbally fluent children (Haebig et al., 2013). Mom's inputs can be argued to be advanced and directed towards rectifying what is understood, which is revealed to be beneficial in the result section. Mom was providing inputs, that guided Carl from a wrong explanation to gaining and rephrasing the new information, which is arguably rather crucial in these sequences, in order for Carl to be able to make this

information transformation. Furthermore, Irvin et al. (2015) conducted a study on how parents speech impact social competences. They argue that speech can be operationalized and guide children with ASD, and that supporting object talk provides a positive impact on social competences over time (Irvin et al., 2015). This supports the results, since we found, that in leading and guiding Carl in what can be argued as an operationalized way, Carl was able to obtain and use the new information presented to him.

This discussion of other findings and current findings is not on first hand obvious, since setting and outcome are not entirely the same. Though it can be argued with all four research findings, that parent communication has an influence on development and practice of speech in children with ASD. This can provide an explanation for the role Mom played in these sequences, when Carl was able to navigate, interpret and learn, thus support previous argumentation. Relating these findings to a classroom situation exhibits, that the role of the teacher seems to be important, regarding learning process and learning outcome, since the teacher, in this sense, can impact and provide an optimal learning situation, through guidance and language comprehension and verbal responsiveness. Therefore, the results reveal, that achieving mutual understanding is dependent on the teacher's communication during the learning situation.

Limitations

In current study, a single case was analyzed to investigate how mutual understanding is achieved in a learning situation, and it is arguably possible to generalize the results. With an intrinsic case study approach, it is possible to explore the in-depth uniqueness of this particular case, thus relinquishing a quest to

generalize the findings towards other cases (Demuth, 2017). Rather this exploration is an attempt to discover a field of research in need of more attention, as the unique communication might instead shed light on similar cases or contexts, and in this sense, offer new perspective on already established issues (Demuth, 2017), related to communication and autism.

The intention of this study was to reach a possible internal generalizability when engaging in communication with the child in this study, e.g. in a classroom setting. In order for this generalization to be plausible, it is necessary to obtain a proper fittingness and transferability of the results (Demuth, 2017). Fittingness being the degree of similarity of two contexts, which, if high enough, results in a transferability of findings from one context to another (Demuth, 2017). A classroom does not have the proper fittingness as a home setting, as the two settings do not overlap. In this case, the child and mother are often engaging in a one-on-one situational setting, but in a classroom, there will be a variety of other students, who will be engaging in the conversation if selected or self-selected as next speaker. However, the context of the institutionalized communication, such as receiving a question and having to reply, has the proper fittingness of the particular communicational frame, thus it is possible for a transferability of the results to a classroom setting, where the child will be communicating with the teacher instead of the mother.

Additionally, Demuth (2017) argues that human actions are guided by previous experience and future oriented expectations, leading to a specific repertoire of thinking and behaving. This means, that researching the communication in a specific context, such as a learning situation within home settings, will reveal in what way the communication unfolds, and what the outcome is. In this sense, by

researching the process of meaning-making and the communication in the interaction between mother and child, it should be possible to infer what communicative components are triggering specific reactions and outcomes. However, as expectations and actions are considered contingent, and therefore context dependent and unique, participants in any interaction need to orient themselves towards each other's utterances, in order to establish a collaborative shared understanding. This will in turn help gain a kind of common sense of the others' intentions and actions, leading the interlocutor to infer the proper reactions (Demuth, 2017). This means, that in order to understand the intentions of a child with autism, when communicating as well as guiding or directing him or her, it is necessary to understand the meaning making processes and situated context of the specific utterances.

Therefore, we consider the results internally generalizable to other settings, given the same communicative frames, such as institutional teaching/learning context, as the past experiences of such frames have a reasonable fittingness. Additionally, the results are transferable to other children, sharing similar meaning-making processes arising from atypical thought processes, by first establishing a mutual understanding. However, the intersubjectivity between Carl and Mom, and the practices of Carl, is based on his and hers uniquely developed personal cultures, meaning that the phenomenon still exist across situations and people, but might be displayed differently. Therefore, it is important to keep an analytical perspective on the communication, as the children base their communicational tendencies on their unique personal culture. Thus, when generalizing the results, it is necessary to keep in mind the uniqueness of this case.

In this respect, a societal perspective might need more cases to provide further support to these results contributing to stronger evidence. Furthermore, because of time limitation the study investigated beforehand found themes in the data. More time and resources would have contributed to further investigations regarding other related themes, such as differences in development comparing old and new videos, which could contribute to more knowledge concerning mutual understanding in a learning situation.

Conclusion and Future Outlook

As children with ASD need clear, structured rules in order to interact socially (Taylor, 2011), getting to know the structure of a learning situation is a good vantage point for these children. In this study, the case in question showed a good understanding of an IRE sequence structure, facilitated by the teaching mother. Due to the fittingness of this structure to a classroom, Carl, and children with similar atypical thought processes, could be able to follow a regular teaching class. However, given the atypical expression of communicative elements, such as practices and repairs as a means of information seeking and showing engagement, it is necessary to contingently be aware of the expectations of action of such elements, in order to achieve a mutual understanding. Furthermore, as Sterponi and Kirby (2015) found in their study, that pragmatic deficits serves a suitable purpose, so did we in our results on atypical communicative actions, and a mutual understanding is necessary in order for the participating teacher, to understand and facilitate the proper answers and instructions.

Additionally, Mom has an important role in the learning situations in this study. As Carl was not able to regain focus on his own, Mom was the structuring

element in the learning situations. She was able to provide, what seemed to be a learning situational setting, which facilitated a good learning outcome. This included a method of shared activities and an engagement in joint attention. Therefore, when in an inclusive classroom, it is necessary for the teacher to facilitate and maintain the structural setting, which fosters a better learning outcome. If this is not maintained, then Carl, and children with ASD with similar atypical thought processes, will likely lose engagement, which might thereby result in a decrease in learning outcome.

Based on our findings, the perspective of children with ASD as having deficiencies, is misunderstood. As supported by studies such as Sterponi and Kirby (2015), Fantasia et al. (2014), and Sterponi and Fasulo (2010), it is necessary to look at such deficiencies in a new perspective, where these alternative thinking patterns are atypical and deviant, but not necessarily a deficiency. Therefore, it is not enough to test the children for their academic competencies, rather these tests should be complemented by an understanding of how children with ASD communicate as a basis for a mutual understanding, when interacting in a learning situation.

For future research, a study with a larger sample would allow for a more comprehensive investigation of mutual understanding in a learning situation. Also, we found that Mom has a central role during the interaction, therefore it is crucial to study if the same results would be achieved, when it is not a primary caregiver that participate in the interaction. Further research could be conducting longitudinal studies were the communicative development that Carl, or a similar child, will go through are the topic. For example, when he starts school, it could first be studied, what tendencies and components he implements in social interactions, and subsequently it could be studied how these components are further developed or might be altered. Finally, there could be a focus on how these elements might

influence his developing communication skills. As we found that atypical actions serve a suitable purpose of showing engagement and information seeking, it could be a promising avenue to look into if more atypical actions serve similar purposes.

Additionally, when looking at conversational components, our research showed, that Carl implemented gestures as a communicative element. This results is supported, as gestures being communicative is studied by Dickerson et al. (2007), who's results are similar to ours. Therefore, future research could include gestures as a communicative element, in order to achieve a better mutual understanding, when communicating with children with ASD.

Lastly, Cekaite (2007) found, that a child with an emergent second language, had a better learning outcome, when the teacher's approach involved multiparty talk. If the components in Carl's language is viewed as atypical, because of a culturally different offset, then how does this further influence the interaction in a classroom? Alternatively, would the difficulties regaining focus, which Carl showed, mean that multiparty talk would hinder the engagement and result in a stagnant learning outcome?

These are all relevant topics to be studied to further a more comprehensive and better communication and learning outcome for children with ASD during learning situations, however the baseline of such research would benefit from a perspective of atypical interaction and not deficiencies.

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