Dementia and learning

The use of tablet computers in joint activities

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Abstract

Living with dementia is generally associated with terms such as loss, confusion, and dependency; not development, agency and collaboration. Contributing to a growing body of research that acknowledges the remaining abilities of people living with dementia, and how they cope with challenges in their everyday lives, this thesis concerns a topic habitually framed by negative presumptions, namely learning.

The risk of developing dementia increases with advancing age, and with an aging population the number of people living with dementia is expected to rise. Dementia is a complex condition that can have various underlying causes; it includes numerous diagnoses and is commonly characterized by a decline in cognitive and communicative functions. Due to its clinical connotations, people living with dementia often face negative assumptions about how they are, and what they can or cannot do. Alongside prevailing metaphors such as a return to childhood or empty shells, people living with dementia have been depicted as passive and disengaged communicators, incapable of initiating social action and asserting agency, who struggle to maintain attention in interactions.

The aim of this thesis is to study novel learning in everyday activities for people living with dementia, taking the use of tablet computers as a case in point. Learning is approached from an interactionist perspective, where it is understood as a social and situated process, and conceptualized as changing participation in joint activities. The data used in this thesis comprises a collection of 50 video recordings where a person living with dementia, who has no previous experience of using touchscreen technologies, is using a tablet computer together with either a caregiver or another person living with dementia. The participants were asked to use the tablet computers according to their own interests, and did not receive any information regarding learning as an objective of their activities. Through four empirical studies, all using the methodological framework of multimodal conversation analysis, this thesis challenges the stereotypical belief that people living with dementia are incapable of novel learning.
Dementia and learning

Study I shows how a woman living with dementia, over the course of six weeks, learns to perform the basic navigational steps needed to use an augmentative and alternative communication application. The analysis demonstrates how the participant's reliance on detailed information from her interlocutors gradually declined both during and across recordings. Study II highlights how people living with dementia position themselves as learners in unfamiliar joint activities. The results emphasize that the participants living with dementia publicly display their current understanding of the ongoing joint activities, introduce learning as a conversational topic, and are actively engaged in soliciting the information needed to partake. Study III shows how professional and family carers support the participants living with dementia in managing the tablet computers. The analysis reveals that the caregivers orient towards the doing of the participants with dementia, are attentive to their displayed understanding of the unfolding activities, and adapt any instructions with detailed multimodal cues if required. Study IV moves away from the dyadic constellations consisting of a person living with dementia together with a caregiver, and instead focuses on how people living with dementia manage the joint activities together with a peer. The results show that the participants treat the activities as collaborative endeavors, and orient towards the displayed competences of each other by offering or soliciting information when needed.

Taken together, the findings from this thesis demonstrate that novel learning is possible for people living with dementia even without the use of structured interventions. The learning process is highly collaborative, and the participants actively support each other's conduct throughout the unfolding activities. Apart from possibilities for repeated participation in joint activities, procedural and agentive aspects of learning for people living with dementia are emphasized.

**Keywords:** Dementia, Learning, Conversation analysis, Collaboration, Situated learning, Technology, Scaffolding, Embodiment
Sammanfattning

Att leva med demens förknippas vanligtvis med termer som förlust, förvirring och beroende; inte utveckling, agens och samarbete. En vanlig föreställning är att nytt lärande är ouppnåeligt för personer med demens. Genom att studera lärande, ansluter den här avhandlingen till ett växande forskningsfält som undersöker hur personer med demens nyttjar kvarvarande förmågor för att hantera de utmaningar som uppstår i vardagen.

Risken att utveckla demens ökar med stigande ålder och med en äldrande befolkning förväntas antalet personer som lever med demens att öka. Demens är ett paraplybegrepp som innefattar en stor mängd sjukdomar som vanligtvis karaktäriseras av förändringar i kognitiva och kommunikativa förmågor. Demenssjukdomars kliniska konnotationer avspeglas inte sällan i allmänna uppfattningar om demens, och personer som lever med demens möter ofta negativa antaganden om hur de är och vad de kan eller inte kan göra. Utöver stereotypa beskrivningar som att gå i barndom eller vara ett tomt skal, finns det föreställningar om att personer med demens är oengagerade samtalspartners, oförmöga att initiera social handling, hävda agens eller upprätthålla fokus i interaktioner.

Avhandlingens syfte är att undersöka nytt lärande i vardagen för personer som lever med demens, med användandet av surfplattor som huvudexempel. I avhandlingen undersöks lärande från ett interaktionsbaserat och situerat perspektiv, där lärande konceptualiseras som förändrat deltagande i en gemensam aktivitet. Den empiriska grunden består av 50 videoinspelningar där en person med demens, som saknar tidigare erfarenheter av tryckkänslig teknik, använder en surfplatta tillsammans med antingen en vårdgivare eller en annan person med demens. Deltagarna ombads att använda surfplattorna efter egna intressen och fick inga instruktioner gällande lärande som ett mål med sitt deltagande. Avhandlingen baseras på fyra artiklar, metodologiskt grundade i multimodal interaktionsanalys, och resultaten kontrasterar
mot den stereotypa bilden av personer med demens som oförmögna till nytt lärande.


Sammantaget visar avhandlingens resultat att nytt lärande är möjligt för personer som lever med demens, även utan strukturerade Interventioner. Lärandeprocessen är starkt kollaborativ och deltagarnas stöttar aktivt varandras bidrag genom aktiviteterna. Utöver möjligheter till upprepad deltagande i gemensamma aktiviteter, framhävs vikten av kroppliga och agensbaserade aspekter för lärandet hos personer med demens.

Nykkelord: Demens, Lärande, Samtalsanalys, Samarbete, Situerat lärande, Teknik, Stöttande, Förkroppsligande
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List of papers

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Table of Contents

Abstract ................................................................................................... iii
Sammanfattning ....................................................................................... v
Acknowledgements ................................................................................ vii
List of papers ........................................................................................ ix
Chapter 1. Introduction ........................................................................ 13
Chapter 2. Background and previous research ..................................... 17
  Dementia ........................................................................................... 17
  Public perceptions of people living with dementia .......................... 19
  Tablet computers and dementia ....................................................... 20
  Learning and dementia ................................................................. 22
  Approaches to learning ................................................................. 24
  Changing participation .................................................................. 25
  Previous microanalytic studies on learning .................................... 27
Chapter 3. Aim and research questions ................................................ 31
Chapter 4. Materials and method ......................................................... 33
  The study ........................................................................................ 33
  First data corpus .............................................................................. 34
    Participants, first data corpus ................................................... 34
    Procedure, first data corpus ...................................................... 34
  Second data corpus ........................................................................ 35
    Participants, second data corpus .............................................. 35
    Procedure, second data corpus ............................................... 36
  Analytical procedure ...................................................................... 38
    Study I .......................................................................................... 38
    Study II ....................................................................................... 39
    Study III ..................................................................................... 40
    Study IV ..................................................................................... 41
Methodological considerations .......................................................... 42
Ethical considerations ......................................................................... 44
Chapter 5. Summary of studies ............................................................. 47
  Study I .............................................................................................. 47
  Study II ............................................................................................ 48
  Study III ............................................................................................ 49
  Study IV ............................................................................................ 50
Chapter 1. Introduction

People living with dementia, or major neurocognitive disorder as it is called in the latest version of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013), often face several cognitive and communicative symptoms that make participation in everyday activities more challenging than it was prior to their disease (Ekström, Lindholm, Majlesi & Samuelsson, 2017; Hydén, 2018). In 2021, it was estimated that more than 55 million people worldwide were living with some form of dementia (Gauthier, Rosa-Neto, Morais & Webster, 2021), a number that is expected to increase to 78 million by the year 2030, and 139 million in 2050 (World Health Organization, 2021). The corresponding figures for people living with dementia in Sweden were estimated to between 130 000 and 150 000 in 2018. Due to population ageing, this number is projected to double by 2050 (Swedish National Board of Health and Welfare, 2018).

During the twentieth century, research within the field of dementia was predominantly approached from a biomedical perspective. While this research undoubtedly led to greater insights on the causes and clinical features of dementia, it yielded little insights on the lived experiences of people diagnosed with the disease (Vernooij-Dassen et al., 2019). As noted by Hydén and Antelius (2017), a psychosocial and agency-based approach to dementia research has gained increasing interest during the last two decades. Rather than focusing on individual cognitive decline, as associated with the disease, emphasis is on the strategies and remaining abilities utilized by the individual, and often in collaboration with others, in his or her everyday life (Hydén & Antelius, 2017; Hydén & Forsblad, 2018).

Even though the lived experiences and remaining abilities of people living with dementia have gained increased attention in research, the biomedical understanding of dementia is still strong in the perception of the general public (Beard & Neary, 2013; Hillman & Latimer, 2017). Accordingly, people living with dementia often face assumptions about their capabilities in everyday activities and social interactions based on
diagnostic labels and clinical criteria (Müller & Schrauf, 2014). Researchers have long described how people living with dementia, due to the associated symptoms on memory, cognition and language, have been portrayed and positioned as passive objects or uninvolved interlocutors, unable to sustain focus and engagement in activities, and incapable of initiating social action and exerting agency (Boyle, 2014; Ekström et al., 2017; Kolanowski, Bossen, Hill, Guzman-Velez & Litaker, 2012; Majlesi & Ekström, 2016; Williams, Webb, Read, James & Davis, 2020). Moreover, an assumption, that to a large extent has been unquestioned thus far, is that people living with dementia are incapable of learning new knowledge and acquiring new abilities (Dupuis & Gillies, 2014; Rosenberg & Nygård, 2017; Thoft, 2017; Tournier, 2020).

Most research on learning and dementia to date has been performed in experimental settings with an outspoken focus on rehabilitative interventions (Clare, 2008; Kudlicka, Martyr, Bahar-Fuchs, Woods & Clare, 2019). Thus, the bulk of studies on learning and dementia have first and foremost explored how focused interventions can be implemented in order for people living with dementia to relearn information or abilities that they once knew. Indeed, Quinn and Blandon (2017) argue that research on learning and dementia has been occupied with containment rather than expansion. Furthermore, they claim that an emphasis on retaining familiar activities, rather than enabling novel experiences, in fact positions people living with dementia outside the realm of learning, and thereby they are "cut-off from one of the vital agencies of life" (Quinn & Blandon, 2017, p.580).

Although much of the existing research on learning and dementia indeed concerns how interventions can be implemented to facilitate relearning of familiar activities, there are some studies exploring novel learning for people living with dementia (e.g. Duff, Gallegos, Cohen & Tranel, 2013; Dunn & Clare, 2007; Haslam, Moss & Hodder, 2010; Ober & Shenaut, 2014). While these studies collectively show that novel learning still is possible for people living with dementia, the information being learnt, such as nonword learning, identification of tangrams or naming of unfamiliar faces, is arguably of low ecological relevance for the individual in his or her everyday life. As proposed by Rosenberg and Nygård
(2017), an area where the capability of novel learning is of increasing relevance is in interaction with the everchanging designs of information and communication technologies.

Information and communication technologies (ICT) such as smartphones, laptops and tablet computers are ubiquitous artefacts in our everyday life, and digital solutions are being implemented throughout all areas of society (Olyphert & Damodaran, 2013). The great advances in ICT development have fostered societal expectations to make use of the devices’ potential for people living with cognitive impairment (Ministry of Health and Social Affairs, 2016; Van der Roest, Wenborn, Pastink, Dröes & Orrell, 2017). Whilst the number of ICT solutions targeting people living with dementia is growing (Joddrell & Astell, 2016), several researchers (e.g., D’Onofrio et al., 2017; Jodrell & Astell, 2019) have pointed out that a lot of the technical solutions are not primarily intended to be used by the person living with dementia, but rather by cognitively healthy people in his or her immediate surroundings (Tyack & Camic, 2017).

Indeed, research concerning technological solutions for people living with dementia is growing in a rapid pace and the implementation of technology covers a broad spectrum of the disease, from diagnosis and assessment, monitoring and caregiving, to leisure activities (Astell et al., 2018). However, very few studies explore whether people living with dementia are able to learn how to manage new and unfamiliar technologies. With an exception of Rosenberg and Nygård (2017), the existing studies on learning, dementia, and technology (e.g. Bier et al., 2015; Bier, Paquette & Macoir, 2018; Imbeault et al., 2014; Imbeault, Langlois, Bocci, Gagnon & Bier, 2018) are conducted in experimental settings, and rely on rehabilitative intervention techniques. Thus, little is still known about how people living with dementia may learn from participating in novel activities in their everyday lives, without structured interventions targeting past proficiencies. Moreover, our knowledge about how people living with dementia experience learning, and how they assert themselves as capable learners in ongoing activities, is to date very modest.
Dementia and learning

In order to gain knowledge about how people living with dementia experience learning in their everyday lives, a new approach seems needed. Accordingly, through four empirical studies and with an interactionist perspective, this dissertation examines how people living with dementia, who have no previous experiences of touchscreen technologies, use tablet computers as a social activity together with people in the settings of their everyday lives. By circumventing the experimental designs and structured interventions used in earlier studies, an ambition with the present dissertation is to contribute to increased knowledge on the cognitive and social abilities of people living with dementia involved in novel learning experiences in everyday activities. In the following, a background to dementia and previous research of relevance to this dissertation is provided.
Chapter 2. Background and previous research

Dementia

Dementia is a syndrome of numerous possible etiologies, and the umbrella term comprises multiple diagnoses with symptoms affecting both cognition and behavior (Mandell & Green, 2011; Whalley, 2015). Alzheimer’s disease is the most common form, or cause, of dementia, accounting for roughly 60 percent of all dementia cases (Mangialasche, Kivipelto, Solomon & Fratiglioni, 2012; Winblad et al., 2016). The second most common subtype of dementia is dementia due to vascular etiology, such as large vessel stroke or microvascular disease, accounting for some 15-20 percent of all diagnosed cases (Marcusson, Blennow, Skoog & Wallin, 2011; Wolters & Ikram, 2019). Following vascular dementia, it is estimated that dementia with Lewy bodies is the third most common subtype of dementia, accounting for approximately 10 percent of the dementia cases (Kane et al., 2018; Yang, Chen, Su & Liu, 2018). Other prominent subtypes of dementia include Creutzfeldt-Jakob disease, frontotemporal dementia, Korsakoff syndrome and dementia due to Parkinson’s disease (Marcusson et al., 2011). However, it is worth noting that it is not seldom that people with dementia symptoms have neuropathological deviations associated with more than one specific subtype of dementia (Alzheimer’s Association, 2022). Approximately five percent of people living with dementia are diagnosed before 65 years of age (Lambert et al., 2014). As such, dementia generally affects older adults and the risk of developing dementia increases exponentially with advancing age (Mangialasche et al., 2012).

The symptomatic criterion for major neurocognitive disorder, regardless of what subtype, is clear evidence of cognitive decline from a previous level of performance in at least one of the following domains: complex attention, executive function, learning and memory, language, perceptual-motor or social cognition (American Psychiatric Association, 2013; Marcusson et al., 2011; Müller & Schrauf, 2014). Further, the cognitive symptoms interfere with the individual’s independence in
Dementia and learning

everyday life to such an extent that he/she requires assistance with complex instrumental activities. The cognitive deficits pertain outside the context of delirium, and the symptoms are not better explained by other mental conditions (American Psychiatric Association, 2013). All forms of dementia are progressive in nature and to this date there is no known cure, only methods of easing the symptoms (Hydén, 2016).

The clinical population is heterogeneous, and the progressive nature of dementia entails great individual differences in cognitive and behavioral symptoms even for people diagnosed with the same type of dementia. Three phases, or stages, are commonly used to describe the progression of dementia: early/mild, middle/moderate, and late/severe stage of dementia (Thoft, 2017).

In Alzheimer’s disease, one of the most prominent symptoms, which is often also one of the very initial symptoms, is declining memory functions. Episodic memory functions, that is the ability of remembering self-experienced events and situations, are typically especially affected (Scheltens, Blennow, Breteler, de Strooper, Frisoni, Salloway and Van der Flier, 2016; Whalley, 2015). During the prodromal stage of Alzheimer’s disease, when the symptoms first occur, it is usually only the affected individual who notices the cognitive change. At this stage, the individuals often make use of compensatory behaviors such as writing memory notes or avoiding certain demanding tasks (Marcusson et al., 2011). For an individual at a mild stage of dementia the memory implications are prominent enough to interfere with his or her daily functioning, and the symptoms are now apparent enough to make people in the immediate surroundings take notice of them (Whalley, 2015). During the mild stage, people living with Alzheimer's disease also commonly experience anomia, or word-finding difficulties, and may have trouble with more complex reasoning. Further clinical indications at this stage might include motor symptoms such as apraxia, where the individual could experience problems with managing a TV-remote or writing (Lesourd, Le Gall, Baumard, Croisile, Jarry & Osiurak, 2013; Marcusson et al., 2011). During this early stage of dementia, the individual is most often still living in ordinary housing, with potential assistance from family carers or home care services.
According to Marcusson and colleagues (2011), the memory impairments during the moderate stage of Alzheimer’s disease are severe enough that even simple tasks, there-and-then, could be challenging to retain in mind. If the individual experiences apraxia, he or she often have trouble dressing him/herself during this stage and might need external assistance. Other motor signs such as spasticity, bradykinesia, atypical posture, and myoclonus are also more frequently observed in individuals living with Alzheimer’s disease, especially during the later stages of the disease (Marcusson et al., 2011; Scarmeas et al., 2004). Moreover, the language ability is commonly impaired both receptively and expressively, leading to vast communicative consequences. Increasing behavioral and emotional symptoms are also more frequently observable during the moderate stage. Furthermore, the individual experiences increasing difficulties in managing basic and complex activities of daily living, and it is therefore common with transitions into residential care facilities (Marcusson et al., 2011). For people living with severe dementia, all prior symptoms aggravate to a point where the individual is in constant need of assistance (Duff et al., 2013; Marcusson et al., 2011; Thoft, 2017).

Public perceptions of people living with dementia

According to Wilkinson (2002), people living with dementia is one of the most excluded groups in our society, experiencing stigmas associated with ageing as well as with life with a cognitive decline. As mentioned in the introduction, the biomedical understanding of dementia has had a great impact on the public portrayal and societal perception of people living with the disease (McParland, Kelly & Innes, 2017). With little consideration regarding the heterogeneity of people living with dementia, the general view of people living with dementia is made akin to severe and irrevocable loss of cognitive functions and an idea of diminished or vanished identity (Hydén, 2016). The reduction of dementia to terms of loss is also present in prevailing metaphors of the disease, and the people diagnosed with the condition, such as a return to childhood (Jongsma & Schweda, 2018), empty shells (Folkmarson Käll, 2017), zombies (Behuniak, 2011), and a social death (Higgs & Gilleard, 2017). When the
public perception of people living with dementia is made equal to diminished cognitive or communicative capacities, there is a risk that cognitively healthy people exclude people living with dementia from participating in novel social activities since they are presupposed to lack the ability to do so (Hydén, 2016; Jongsma & Schweda, 2018).

Social interaction involving cognitively healthy individuals and people living with cognitive or communicative impairments, such as dementia, are at times characterized as atypical interactions (Mikesell, 2016; Wilkinson, Rae & Rasmussen, 2020). Indeed, as dementia progresses for the individual, so does the deterioration of individual cognitive and communicative abilities (Ekström et al., 2017). Some communicative problems that people living with dementia often face include word-finding difficulties, problems with retrospective telling, verbal disfluency and diminished language comprehension (Hydén, 2018; Jones, 2015; Perkins, Whitworth & Lesser, 1998). However, as noted by several scholars (e.g. Ekström et al., 2017; Hamilton, 2019; Wilkinson et al., 2020), the bulk of information about the communicative deficits in dementia has been obtained through test batteries in clinical settings, and accordingly does not elucidate how an individual living with dementia manages these difficulties in everyday settings and in interaction with others.

In sum, people living with dementia are faced with numerous assumptions about their cognitive and communicative abilities, often based on decontextualized assessments, which in extension might exclude them from partaking in novel everyday activities (Hydén, 2016; Müller & Schrauf, 2014).

Tablet computers and dementia

With lower costs and an increased availability, information and communication technologies such as tablet computers are considered to have great potential in supporting and improving older people’s health and quality of life (Astell et al., 2018; Sixsmith, 2013). However, in accordance with the aforementioned assumptions on the capabilities of people
living with dementia, there are many presumptions and beliefs among the general public regarding older adults and their use, or non-use, of modern technologies (Sixsmith, 2013). Some frequently stated assumptions are that older adults lack interest in using ICTs, that older adults are afraid of using unfamiliar technologies, and that older adults lack the cognitive or physical capability to use modern technologies (Larsson Ranada, 2015; Wandke, Sengpiel & Sönksen, 2012). Wandke and colleagues (2012) argue that whilst the various assumptions are vastly overgeneralized, there are indeed potential barriers to older people’s usage of ICTs. Several studies (e.g., Deelio & McWorther, 2017; Sims, Reed & Carr, 2017; Taipale & Hänninen, 2018; Zambianchi & Carelli, 2018) argue from a similar point of view stating that even though there are some existing barriers, such as cost, self-efficacy, and perception of usefulness of the ICT, older adults’ attitudes towards technology are generally positive, and the use of ICTs amongst older people is associated with enhanced physical and mental well-being.

In their systematic review of touchscreen interventions and the well-being of people with dementia and caregivers, Tyack and Camic (2017) conclude that there are prevailing believes that people with dementia are unable to use touchscreen technologies and they argue that this idea needs to be challenged. This is further addressed by Joddrell and Astell (2016) who present data showing how devices using touchscreen interfaces, such as tablet computers, are considered to be user-friendly and indeed very suitable for people living with dementia. The touchscreen control method eliminates the need for external input devices, such as computer mice, thus reducing the cognitive load associated with hand-eye coordination (Joddrell & Astell, 2016). Moreover, the multifunctional use, mobile flexibility, and the possibility to customize the devices and applications to the intended user through accessibility features are emphasized as valuable aspects for people living with dementia (Joddrell & Astell, 2016). Touchscreen technologies are considered to provide a platform which enables people with dementia to participate on more equal grounds in social interactions with others (Joddrell & Astell, 2016; Tyack & Camic, 2017). Swan and colleagues (2018) advocate the advantages of installing a wide variety of applications when using tablet computers at residential care facilities. In doing
Dementia and learning

In accordance with the assumption of people living with dementia being incapable of using modern technology there is, despite several studies showing the opposite (e.g. Bier, et al., 2008; Duff, Gallegos, Cohen & Tanel, 2013; Voigt-Radloff, et al., 2017), a traditionally anchored belief in the general public that people living with dementia are unable to acquire new knowledge or to learn new skills due to the memory deficits associated with the disease (Dupuis & Gillies, 2014; Thoft, 2017; Tournier, 2020).

The primary focus of studies regarding learning and dementia has been to investigate the efficacy of structured intervention techniques, and how cognitively healthy individuals can use these in teaching people living with dementia to compensate for their cognitive decline. Intervention techniques such as spaced retrieval training (e.g. Fiksdal, Houlihan & Buchanan, 2012; Viccaro, Sands & Springer, 2019), vanishing cues (e.g. Glisky, Schacter & Tulving, 1986; Haslam, Moss & Hodder, 2010), and errorless learning (e.g. de Werd, Boelen, Rikkert & Kessels, 2013; Kessels & Hensken, 2009) are some frequently used approaches aiming to facilitate learning for people with dementia.

In interventions using spaced retrieval, or expanding rehearsal training, the person living with dementia is requested to recall items of information, such as object naming or object location, over progressively expanded time intervals. If the targeted information is not recalled, the correct response is given and the interval is reduced until the person living with dementia manages to recall the information (Camp, Foss, O’Hanlon & Stevens, 1996; Crowe & Gabriel, 2013; Small & Cochrane, 2020). The vanishing cues technique has primarily been used in studies on face-name learning. In these studies, pictures of faces are presented
with a corresponding name that the person living with dementia is to recall. Initially the names are spelled out in their entirety, and over subsequent trials the letters are removed one at a time from right to left until the person is able to recall the targeted name with minimal cues (Dunn & Clare, 2007; Haslam et al., 2010). Errorless learning can be used as an individual intervention technique or combined with other techniques (Clare, 2008). The general principle is to prevent the person living with dementia from making errors in performing a target task at hand. It is argued that reducing errors in the learning process, through means such as immediate error correction or parsing the task in smaller segments, will minimize the risk of incorrect learning (Clare & Jones, 2008; de Werd et al., 2013).

Rosenberg and Nygård (2017) argue that while studies using the aforementioned intervention techniques show that people living with dementia still are capable of learning, the information being learnt, such as nonword learning or naming of unfamiliar faces, is of low ecological validity. In other words, experimental studies of learning that are separated from the settings and activities of daily practices do little to illuminate how an individual typically encounter and manage learning experiences in his/her everyday life (Lave, 2019; Säljö, 2017).

Furthermore, Rosenberg and Nygård (2017) raise concerns regarding the methodological approach used in prior research efforts where a clear focus has been on how interventions are used in teaching people with dementia rather than how they learn on their own initiatives in the context of their everyday lives. Duff and colleagues (2013), argue from a similar point of view and further emphasize the importance of social interplay amongst participants, stating that active cooperation, interaction, and communication facilitate learning for people living with dementia. Moreover, Müller and Mok (2014) raise the importance of offering people with dementia the possibilities of experiencing and participating in diverse social activities, and thereby give them opportunities to learn, expressing that “the drive to know, or the active negotiation of common ground, is a cognitive activity that is very much undervalued in the culture of dementia” (p. 82).
Approaches to learning

The notion of learning is, to say the very least, complex and there is no generally accepted definition or lone theory of explanation (Illeris, 2009; Rajala, Kumpulainen, Rainio, Hilppö & Lipponen, 2016; Säljö, 2015). The dominant view of learning to date has been developed in psychological, cognitive, and neurobiological traditions with studies commonly conducted in experimental settings (Wagoner & Gillespie, 2017). In these studies, emphasis has been on the individual’s ability to remember and recall an item of interest. Accordingly, knowledge has been described as something encapsulated in the brain of an individual, and learning as the intent intake of the same (Bredo, 1997; Lave, 2019). The general assumption within these experimental traditions is that the successfulness of a learning experience can be determined by how much information an individual is able to recall at a later stage. According to Säljö (2017), research that focuses on intracranial and individual processes rarely elucidates how people may use artefacts to support their learning and remembering. The theoretical approach to learning as an individual faculty is akin to what Sfard (2008) has termed an acquisitionist perspective.

Other traditions approach learning differently. Rather than studying learning as a one-way transmission of information, with emphasis on the individual and his or her intentional efforts to memorize predefined information, social and interactional aspects of learning are highlighted (Säljö, 2017). In these traditions, learning is considered to occur through, and is defined as, changing participation in activities of everyday life (Lave, 2019; Martin & Sahlström, 2010). Much of the contemporary theories on learning as changing participation draw influence from the sociocultural perspective originally proposed by Vygotsky (1978). According to Vygotsky’s (1978) idea of the zone of proximal development, learning and cognitive maturity are seen as dependent on participation in social activities and interaction involving more experienced members of a community. In interaction, more experienced individuals, the experts, are capable of structuring activities in ways that enables less experienced individuals, the novices, to participate. Through the use of guiding, or scaffolding practices, and a possibility for repeated participation in an activity, novice individuals gradually become more
Background and previous research

experienced and independent, to ultimately being able to manage the activity with little or no support, that is they have transitioned to "experts" (Bredo, 1997; Hydén & Forsblad, 2018).

Along these lines, Sfard (2008) describes how there, over the past decades, has been a theoretical shift away from the acquisitionist perspective on learning to a participationist perspective. From a participationist perspective, learning is not considered to be explicitly retained to the mind of an individual learner, nor as something restricted to formally designed settings of structured teaching. Learning is instead considered a process intrinsic to all activities of everyday life and furthermore distributed amongst individuals acting in concert with each other and any artefacts in the immediate environment (Hutchins, 1995; Lave & Wenger, 1991; Melander, 2009). Accordingly, learning is closely tied to interaction and collaboration, and to the possibilities of increasing participation in novel activities.

Changing participation

Central to the concept of participation is, according to Lave and Wenger (1991), the situated negotiation and renegotiation of meaning between experts and novices in different communities of practice. Changing participation, in this sense, involves the trajectory of an unexperienced participant from peripheral to increasingly active participation in an activity. Emphasizing the collaborative aspect of interaction, Clark (1996) describes how participants engage in joint activities. Joint activities are usually definable by a purpose or a goal that the participants pursue in their interaction. Additionally, joint activities commonly contain several smaller joint projects, each with specific sub-goals (Bangerter & Clark, 2003). That is, people enter joint activities and in cooperation with others they advance towards an overarching goal through several joint projects, and once the dominant goal has been reached the joint activity is completed (Clark, 1996). All joint activities and projects require coordination, and they progress incrementally through turn-taking and the participants' verbal and embodied contributions to the activity (Bangerter & Clark, 2003). However, since people living with dementia often
experience major cognitive and communicative difficulties, collaboration in joint activities may be a particularly challenging endeavor (Hydén & Forsblad, 2018).

As mentioned earlier, interactions involving people living with dementia and cognitively healthy interlocutors are not seldom described as atypical interactions (Mikesell, 2016). Atypical interaction research primarily draws on, and juxtaposes, the accumulated findings from conversation analysis regarding what could be considered typical, or generic, talk-in-interaction. That is, whereas individuals engaged in "typical" interactions (i.e., interactions involving non-cognitively/communicatively impaired participants) are expected to adhere to the generic organization of interactional practices, individuals living with cognitive/communicative impairments may not be able to uphold the taken-for-granted traits of conversation, thus making the interactions recognizable as deviant or atypical (Wilkinson, 2019; Wilkinson et al., 2020).

An atypical trait that is likely observed in interactions where one or more participants have dementia, is the asymmetry relating to epistemic status, and cognitive or linguistic abilities between the interlocutors (Hydén, 2014; Williams, Webb, Dowling & Gall, 2018). In joint activities involving a participant living with dementia, the asymmetry is often noticeable in the distribution of the participants' communicative labor, where the cognitively healthy participant takes on increased interactional responsibilities. Some interactional responsibilities include structuring ongoing joint activities in appropriate ways, taking initiatives to progress within and across joint projects, engaging in advanced repair work when necessary, and keeping track of what has been accomplished in the activities thus far (Ekström et al., 2017; Hydén & Forsblad, 2018). However, Majlesi and Ekström (2016) argue that this interactional asymmetry should not necessarily be treated as a sign of incompetence on behalf of the participant living with dementia. Instead, they emphasize the delicate strategies a person with dementia can utilize in order to compensate for any challenges encountered in interaction. In their study, they show how a man diagnosed with Alzheimer's disease, continually requests confirmation from his cognitively healthy spouse while carrying out a task. Though his behavior seemingly nurtures the
Background and previous research

asymmetric relation it is through his requests that his spouse is able to scaffold the activity by adjusting her instructions to an appropriate level (Majlesi & Ekström, 2016). The term scaffolding was originally introduced by Wood, Bruner and Ross (1976) as a metaphor to describe the process in which an expert, or tutor, by utilizing various resources structures an ongoing activity in ways that enables a learner, or novice, to participate and carry out tasks that otherwise would not be possible (see also Majlesi, Ekström & Hydén, 2021). Indeed, Majlesi and Ekström (2016) argue that an asymmetry, in itself, fosters collaboration in that it motivates the participants to actively negotiate what resources are needed in order to proceed with the activity, thus treating it as a joint endeavor and a collaborative achievement.

Previous microanalytic studies on learning

Conversation analysis (CA) is both a scientific method and a theoretical approach to study the fundamental features that, moment by moment, build human action and social interaction (Heritage, 2011; Mondada, 2018). Although CA has its roots in sociology, the scientific field is now widely interdisciplinary stretching across several disciplines dealing with social interaction, such as psychology, anthropology, linguistics, and education (Sidnell & Stivers, 2013). A focal point of departure within CA is to approach interaction from an emic perspective, that is to ground the analysis in what the participants themselves orient to and treat as being interactionally relevant (Kasper & Wagner, 2014). An interlocutor’s understanding of the preceding interactional turn is expressed in his/her following turn. Thus, this sequential display of understanding becomes visible not only for other participants but also for the researcher (Sacks, Schegloff & Jefferson, 1974). Early studies of CA (e.g., Sacks et al., 1974; Schegloff, 1968) used audio recordings as their empirical basis, thus limiting the analyses to turns-at-talk of verbal interchange (Eskildsen & Majlesi, 2018). During the last decades, the use of video-recorded data has been ever-growing and therefore enabling a broadened, multimodal, analysis in which visual aspects of interaction such as the participants’ embodied actions, gaze, facial expressions, and use of artefacts are analyzable (Mondada, 2018).
Traditionally, CA has employed a comparative analytical procedure that involves finding specific, recurring, phenomena or practices in single instances of interaction. By building a collection of the particular cases, generalizations of the phenomena are drawn (Mondada, 2018; Sidnell & Stivers, 2013). Early research within the CA-field focused on, and thus compared, interactional practices by speakers in quite homogeneous settings regarding socioeconomical status and ethnicities (Wagner, Doehler & González-Martínes, 2018). Zimmerman (1999) emphasized the need for a broadened spectrum of comparative CA research towards what he termed horizontal (i.e., comparisons across cultures, languages and settings) and vertical (i.e., developmental and comparison of change across time) comparative research. Wagner, Doehler and González-Martínes (2018) claim that even though the number of studies adopting a horizontal perspective have increased immensely during the last decades, the scope of CA research analyzing change over time is still scarce in comparison. According to Martin and Sahlström (2010), a longitudinal approach is needed for studies targeting interactional changes. This reasoning is further substantiated by Wagner and colleagues (2018), who advocate a systematic longitudinal approach of conversation analysis when studying learning based on the micro-level organization of social interaction. The studies included in the present thesis, will draw on, and contribute to, both horizontal and vertical interactional research.

To date, most of the longitudinal CA studies investigate the development of interactional competence seen in second language speakers. While there has been an empirical emphasis on second language learning, especially in educational settings, not all longitudinal CA work concern this (Wagner et al., 2018). In their study, Martin and Sahlström (2010) explore how a patient over the course of nine months gradually becomes more competent in performing a specific physiotherapeutic exercise. The interactional change observed was concerning verbal and embodied repair work where the patient transitions from a point of not being able to identify, nor correct, a wrongly executed movement to being able to do so without any involvement from the physiotherapist (for a more detailed description, see Martin & Sahlström, 2010). In another study, Nguyen and Nguyen (2016) analyzed the development of a four-
year-old child’s request negotiation practices, that is how the child pursued a non-granting response from his parents. With data stretching over 12 months they demonstrate how the child learns to negotiate in more successful ways by modifying several interactional practices, such as turn design and stance taking, with an increased sensitivity to the local sequential context of talk and the social norms inferred by the parents (Nguyen & Nguyen, 2016). Broth, Cromdal and Levin (2017) investigated the progression of a trainee driver who is learning to set a car in motion. Their analysis is based on video recordings capturing one hour of the trainee driver’s very first driving lesson. Thus, the authors (see also Björklund, 2018) employ a micro-longitudinal approach to capture the trajectory of learning there-and-then whilst highlighting how the participants continuously and demonstrably orient towards each other and an increased, or in other ways changed, state of competence. For example, as the driving lesson progresses the instructor is seen giving more truncated instructions and fewer assessment tokens relating to the trainee driver’s performance in handling the brake and clutch pedal when starting the engine and instead moves on to giving in-depth instructions on how the trainee should engage the gas pedal in order to set the car in motion. The gradual shift of focus and change of instruction design is argued to explicate that the driving instructor is acknowledging a progressively increased competence in his student (Broth et al., 2017). This reasoning is further explicated by Wagner and colleagues (2018), stating that “In a nutshell, then, from an emic perspective, conduct is competent when it is analyzable and recognizable for what it is by co-participants, that is, when it provides no grounds for comment or repair” (p. 27).

Though the interactional phenomena being tracked, as well as the chosen timescales, varies greatly between the aforementioned studies there are central commonalities. They all investigate how interactional practices undergo change over time, a change that is contextually sensitive and oriented to by participants in interaction as a display of increased competence or changing participation. However, not all conversation analytic studies on learning are longitudinal. Another strand of research concerns how learning, or aspects of relevance for learning, are made a focal concern in interaction amongst participants. This includes,
Dementia and learning

for example, studies targeting the identification and formulation of knowledge gaps (Koole, 2012), how individuals assert agency by taking initiatives in activities (Waring, 2011), and how peer assessments are carried out (Ekström, 2013; Melander Bowden & Aarsand, 2020).

With a theoretical understanding of learning as changing participation in everyday social activities, and by using conversation analysis as a methodological approach in order to apprehend these changes, one should be able to study learning for people living with dementia whilst avoiding the decontextualization described by Müller and Schrauf (2014), Rosenberg and Nygård (2017) and Hydén (2016). In the following, the aim and the research questions guiding this dissertation are explicated.
Chapter 3. Aim and research questions

The rationale behind studying how people living with dementia learn to use tablet computers as a social activity is threefold. Firstly, by studying how unexperienced users of touchscreen technologies manage tablet computers over an extended period of weeks, it is possible to ensure novel learning rather than relearning of prior skills. Secondly, as declared in a recent state public report on welfare technologies in elder care (SOU 2020:14), the implementation of welfare technologies, such as tablet computers, is rapidly increasing in all public sectors of Sweden, with elder care services being in the forefront of this development. To meet the increase of welfare technologies throughout society, the Swedish Government has established a digitalization strategy (SKR 2017/18:47) where increased digital competence is the primary objective. According to the state public report on welfare technologies in elder care, this objective is key to ensure social, and societal, inclusion for older adults with cognitive decline such as people living with dementia (SOU 2020:14). Thirdly, by studying how people living with dementia use tablet computers as a social activity, on a one-to-one basis, in cooperation with others it is possible to explore the interactional strategies used in the learning process. Further, by studying how people living with dementia partake in the same activities with the same interlocutors over a consecutive number of weeks it is possible to trace interactional changes in the dyads’ communicative labor.

With this dissertation, my intention is to make a contribution to, and expand, the existing research on dementia and learning, as well as the growing body of studies on longitudinal interaction analysis, and to empirically develop the understanding about how learning is constituted in everyday interactions of people living with dementia.

The aim of this dissertation is to study novel learning in everyday activities for people with dementia. More specifically, to examine how people living with dementia learn to use tablet computers as a social activity in interaction with cognitively healthy adults and other people living with dementia.
In pursuing the overarching aim, the following research questions are posed to guide the analyses, accentuate the progression across the included studies, and contribute to the concluding discussion:

I. How, if at all, does learning take place in unfamiliar everyday activities, such as using tablet computers, for people living with dementia?

II. In what ways, if at all, do people living with dementia assert agency in activities where learning could occur?

III. What scaffolding practices, such as locally adapted directives and situated aspects of the physical environment, can be used in learning experiences connected to tablet computers, and how do these facilitate learning?

IV. What characterizes the interactional organization in dyadic joint activities involving tablet computers when people living with dementia do not have access to support from cognitively healthy individuals?

In the following chapter, the materials and methodology of this dissertation are described.
Chapter 4. Materials and method

The study

My work is connected to Center for Dementia Research (CEDER) and the ongoing research program *Life with Dementia: Communication, Relations and Cognition*, funded by FORTE: the Swedish Research Council for Health, Working life and Welfare. The general aim of the research program is to contribute to initiatives and interventions that will counteract social exclusion for people living with dementia and increase social inclusion and participation for the group. My studies relate to two of the research program’s focal areas, namely;

(I) How remaining social, cognitive and linguistic recourses, as well as the personal expertise, of people living with dementia can be used in various everyday contexts to sustain and enhance relations and cognition, and facilitate social participation and inclusion

(II) How information and communication technologies can be used as resources for sustaining and developing collaboration, communication and cognition in various contexts

The dissertation is based on video recordings from two separate data corpora. Each corpus comprises interactions involving people living with dementia, who have no previous experience of touchscreen technologies, using tablet computers as a social activity in interaction with either cognitively healthy adults, that is formal caregivers or their next-of-kin, or other people living with dementia.

Data from the first corpus provides the analytical ground for Study I. In Study II and IV, data from the second corpus composes the empirical basis. Study III bridges data from both corpora. In the following, an overview of the corpora is given.
First data corpus

This data was collected in 2013 for a pilot project conducted at CEDER, Linköping University. The corpus is from a case study and comprises video recordings of a woman diagnosed with Alzheimer’s disease who is using a tablet computer with her cognitively healthy spouse in their home. The aim of the project was to study the possibilities and pitfalls of using tablet computers to support the everyday communication for people with dementia and their interlocutors.

Participants, first data corpus

The first data corpus includes Ida, a 52-year-old woman diagnosed with Alzheimer’s disease, her cognitively healthy husband Max, and a researcher affiliated with CEDER who supervised the data collection. At the time when the video recordings were made, Ida experienced significant communicative problems, both regarding receptive and expressive language. Further, Ida showed clear difficulties with her episodic memory. However, Ida was still verbal and had no difficulties with articulation. Ida was diagnosed with dementia approximately one year before the data collection and no further formal tests assessing language or cognition were conducted in connection to this study.

Procedure, first data corpus

Prior to the data collection, the personalized communication application, GoTalkNow, was customized by Ida and the researcher connected to CEDER, a speech-language pathologist experienced in augmentative and alternative communication. Together they tailored the application with content relating to Ida’s personal interests and communicative needs. The application contained pictures and videos of her family, familiar places, activities of everyday-life, future activities and more. Max did not participate in the customization process, therefore the content was unfamiliar to him when he and Ida started using the tablet computer.
The couple were given a video camera and were instructed to make video recordings of their everyday interaction involving the tablet computer. The original study had no focus on learning. Before the recording-period started, Ida and Max got basic instructions on how to operate the tablet computer and the application. The recordings were carried out in the couple's home, and over the course of six weeks they recorded five interactions involving the tablet computer. An additional recording of Ida and the speech-language pathologist was made at the end of the six-week period.

Second data corpus

The data collection for the second corpus started in the fall of 2018 and ended in the fall of 2019. The data collection was designed and carried out by myself. This corpus comprises a total number of 44 video recordings of people living with dementia who use tablet computers as a social activity, on a one-to-one basis, together with formal caregivers at residential care facilities, other people living with dementia, or cognitively healthy spouses in their home environment.

Participants, second data corpus

The second data corpus includes eight people living with dementia in residential care facilities and one woman living with dementia in ordinary housing (see Table 1). In addition, the corpus includes eight formal caregivers and one cognitively healthy spouse. The participants were grouped into dyads consisting of one individual living with dementia and one cognitively healthy participant. Furthermore, the participants living with dementia in residential care facilities were paired with one another, forming an additional dyad constellation. Inclusion criteria for the participants living with dementia were: a confirmed diagnosis of dementia, no prior established experience of touchscreen technologies, and a proxy-perceived age adequate, or corrected, vision and level of hearing. The proxy-based Cognitive Impairment Questionnaire (Åstrand, Rolstad & Wallin 2010), targeting neurocognitive symptoms, was answered by the cognitively healthy participants in order to acquire an estimation of
the current cognitive status of the participants living with dementia. The participant living with dementia in her home environment was recruited for participation via a next-of-kin support center and the other participants were recruited from residential care facilities with designated dementia units in the county of Östergötland, Sweden.

<table>
<thead>
<tr>
<th>Age</th>
<th>Diagnosis</th>
<th>Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate</td>
<td>83 Alzheimer’s disease</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Roman</td>
<td>66 Alzheimer’s disease</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Iris</td>
<td>79 Unspecified dementia</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Geri</td>
<td>96 Alzheimer’s disease</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Judi</td>
<td>90 Alzheimer’s disease</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Joan</td>
<td>55 Substance induced dementia</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Simon</td>
<td>90 Alzheimer’s disease</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Roger</td>
<td>90 Alzheimer’s disease</td>
<td>Residential care facility</td>
</tr>
<tr>
<td>Emma</td>
<td>62 Alzheimer’s disease</td>
<td>Ordinary housing</td>
</tr>
</tbody>
</table>

Table 1. Participant characteristics - second data corpus

Procedure, second data corpus

Twice a week, during the course of four weeks, the social activities involving the participants with dementia and their use of the tablet computers were video recorded. For the participants living in residential care facilities, there was one weekly recording made per peer dyad constellation. However, some recordings were cancelled when the participant(s) felt unwell on the scheduled day of data collection. Audio and
video documentation of the activities were captured through the use of two external cameras, shooting from different angles. Apart from Roman and Joan, where the recordings were made by their formal caregivers, all recordings from the residential care facilities were carried out by me. The recordings of Emma were captured by her spouse. The dyads were encouraged to use the tablet computers as often as possible, preferably on a daily basis, with each session lasting for as long as they felt like.

During their participation each participant living with dementia had access to a personal tablet computer containing several pre-installed applications and the possibility to connect to the internet. Apart from the built-in applications, such as camera, calendar, email service, YouTube and web browser, two applications developed for digital communication and leisure support, CIRCA (Astell, Smith, Potter & Preston-Jones, 2018) and CIRCUS (Astell et al., 2018), were pre-installed. Other pre-installed applications included an application for drawing (Tayasui, 2018), streaming services for Swedish radio (Sveriges Radio, 2018) and television (Sveriges Television AB, 2018), and an application mimicking a piano (Peterb, 2016). Additional applications were installed following any requests made by the enrolled participants.

Prior to their participation, all participants received standardized information, both verbally and in text with visual support, regarding how to operate the tablet computer and the pre-installed applications. Before an activity was video recorded, the tablet computer was placed on the tabletop, in the space between the participants’ seats with the intention of encouraging and facilitating use not only from the cognitively healthy interlocutor. No further directive on how the dyads were to structure their activity was given. Instead, the course of activity was expected to derive from the dyads’ interest there-and-then. As with the first data corpus, there was no outspoken instruction for any of the participants that they should focus on learning.
Dementia and learning

Analytical procedure

All included studies in this dissertation build on analysis grounded in video-recorded data of people living with dementia who use tablet computers as a social activity in interaction with others. When studying interaction, drawing on a microanalytical approach, the use of video data becomes a valuable resource. The video recordings allow for repeated scrutiny of the sequential unfolding of actions, moment-by-moment, as it was produced by the participants there-and-then (Luff, Heath & Pitsch, 2009). As a first step in the analysis, the recordings are repeatedly looked through and interactional phenomena with potential relevance for learning, such as repair work (Sahlström & Martin, 2010), requests for information, clarification or confirmation (Kasper & Wagner, 2014), and deictic gestures (Eskildsen & Wagner, 2018), are noted. For this thesis, the software ELAN (2020) is used for an initial coding of the data. Following the identification of relevant interactional phenomena, sequences of special interest are chosen for further inquiry and are subsequently transcribed according to multimodal conventions suggested by Hepburn and Bolden (2013) and Goodwin (2018). In the following, the methodological considerations and analytical procedures of the four studies are outlined.

Study I

When studying learning in interaction, Koschmann (2013) and Linell (2009) argue that it is crucial to analyze data that track participation involving the same interlocutors engaged in recurring types of interaction sequences over a stretched period of time. With studies in experimental settings, and with dyads comprising cognitively healthy interlocutors, Clark and colleagues (e.g. Bangarter & Clark, 2003; Clark & Wilkes-Gibbs, 1986; Isaacs & Clark, 1987) demonstrated how participants engaged in repeated joint activities, such as matching tasks, gradually needed less time, used fewer turns, and also less words to complete the embedded joint projects of the overarching joint activities. These studies emphasized how the gap between the "expert" and the "novice" became less obvious with the novice's gradual growth of involvement in the activity over repeated trials. In other words, the novices had moved from
Materials and method

Peripheral participation to an increasingly active participation in the activities (Goodwin, 2018; Lave & Wenger, 1991).

The analysis in Study I was informed by practices of conversation analysis and interactional analysis. With a methodological approach influenced by the studies of Clark and colleagues mentioned above, sequences of reoccurring joint projects within, and across, the different recordings pertaining to the first data corpus were selected for scrutiny. The selection of joint projects was limited to instances of (i) unlocking the iPad, (ii) navigating to the home screen, (iii) navigating to a preceding screen and (iv) closing the application. The rationale behind the selection was that any potential development in managing the tablet computer and the GoTalkNow application would indicate novel learning since neither Ida nor Mats had any prior experience of using touchscreen technologies. Following the identification of the reoccurring joint projects, the participants' number of turns, words and time used in completing them was quantitatively measured and compared from the first to the last week. In addition to the quantitative measures, the analysis included qualitative findings relating to changes in the organization of the interaction.

Study II

People living with dementia often experience immense difficulties with retrospective telling due to changes in memory functions (Hydén, 2018). This poses challenges for qualitative methods that heavily rely on recalling and coherently articulating past experiences, such as interviews (Hubbard, Downs & Tester, 2003; Nygård, 2006; Smith, Mountain & Hawkins, 2018). As suggested by Webb, Williams, Gall and Dowling (2020), it is beneficial to use observational research techniques and video recordings of naturally occurring interactions, such as interaction analysis, as a complementary approach to obtain the lived experiences of people living with dementia. To date, few, if any, studies examine how people living with dementia experience and assert themselves as learners in novel activities. In joint activities, the participants' other-oriented and incremental verbal and embodied contributions are the means through which participants explicate their current sense-making and
Dementia and learning

experiences of the activity to their interlocutors (Linell, 2011). Consequently, the interplay of unfolding contributions can be used as a basis to study participatory engagement and experience (Potter, 2012).

Study II included participants from the second data corpus who were living in residential care facilities. Further, the empirical basis was limited to 22 video recordings comprising the dyads of a person living with dementia in interaction with a formal caregiver. The methodological point of departure was informed by practices of conversation analysis as advocated by Webb and colleagues (2020). In the 22 video recordings, a collection of 134 sequences where the participants living with dementia positioned themselves as learners and made their experience and engagement public to their communication partner were established. The material was transcribed according to multimodal conversation analytic principles (Hepburn & Bolden, 2013) by the first author.

From the 134 sequences, four distinct types of contributions were identified: (i) Requests, (ii) Accounts, (iii) Formulations and (iv) Meta-comments. The term engagement displays was coined to encompass these conversational practices.

Study III

Within both home-based and residential eldercare services, the implementation of digital welfare technologies, such as tablet computers, is rapidly increasing (Swedish National Board of Health and Welfare, 2021). This, in turn, might pose a challenge for the formal and informal caregivers who are responsible of introducing the technology to the care receiver, for example a novice user living with dementia (Bastoni et al., 2021). Building on the findings from Study I, where we showed that an individual living with dementia could learn to use a tablet computer, Study III was concerned with the interactional organization of instructions in joint activities where such learning could occur. While previous studies have shown that cognitively healthy individuals may structure ongoing joint activities to facilitate the participation of people living with dementia (e.g. Hydén, 2014; Gjernes & Måseide, 2020), the intersection between learning for people living with dementia and the interactional organization of instructions in joint activities remains unexplored. Thus,
by analyzing how the joint activities of using tablet computers unfold between cognitively healthy individuals and novice touchscreen users living with dementia, any facilitating measures and potential pitfalls when introducing novel technology could be discerned.

Study III included video recordings from all included participants, that is both the first and second data corpus was used. The empirical basis consisted of 41 video recordings where the participants living with dementia used a tablet computer together with either formal caregivers or their next-of-kin. Following the data driven approach of conversation analysis (Sidnell & Stivers, 2013), we found that the joint activities primarily unfolded through directive-response sequences initiated by the cognitively healthy participants (Craven & Potter, 2010; Goodwin & Cekatie, 2018). After establishing a collection of 287 directive-response sequences, the material was transcribed according to multimodal modal conversation analytic conventions (Mondada, 2018). In our analysis of the collection, two main categories emerged; we found that the directive-response sequences were either accomplished (i) without upgraded directives in subsequent turns, or (ii) with upgraded directives in subsequent turns. Furthermore, a sub-category of sequences pertaining to (ii) was identified; namely (iii) directive-response sequences where the requested action was ultimately performed by a cognitively healthy participant.

Study IV

Joint activities between cognitively healthy individuals and people living with dementia are typically characterized by an asymmetrical distribution of interactional labor (Linell, 2009; Majlesi & Ekström, 2016; Wilkinson, Rae & Rasmussen, 2020). One of many possible aspects that might entail asymmetries in interaction regards differences in the participants' epistemic access (Enfield, 2011a; Linell & Luckmann, 1991). From a conversation analytic perspective, knowledge is analyzed as an interactional phenomenon that is publicly displayed and negotiated through the participants' incremental verbal and embodied contributions (Goodwin, 2013; Stivers, Mondada & Steensig, 2011). Whereas joint activities between people living with dementia and cognitively healthy
Dementia and learning

individuals typically entail the cognitively healthy participants to act as "experts", supporting the participants living with dementia in managing the activities (Hydén & Forsblad, 2018), less is known about how people living with dementia display their own knowledge in unassisted instances.

The analysis for study IV was made following practices of conversation analysis and multimodal interaction analysis (Goodwin, 2018; Sidnell & Stivers, 2013). For this study, material from the second data corpus was used. Specifically, 7 video recordings with dyads consisting only of people living with dementia was selected for further analysis. The analysis built on 97 sequences where the participants living with dementia made efforts to progress within their ongoing joint activities without the involvement of any cognitively healthy interlocutors. The rationale for examining unassisted progression efforts made by the participants living with dementia was to obtain their own knowledge displays. On the basis of whether or not their joint project was completed, three separate categories of progression efforts emerged. Their progression efforts were either (i) accomplished without preceding negotiations, (ii) not accomplished despite extended problem-solving sequences, or (iii) accomplished following collaborative negotiations.

Methodological considerations

In the preceding section, methodological considerations pertaining to the included papers were raised. It is, however, also important to discuss the methodological strengths and limitations of this thesis on a general level.

Considering the intention to further understandings about how learning may take place in everyday interactions for people living with dementia, the analysis of video data using a conversation analytic approach has been advantageous. Unlike previous research on learning and dementia, which typically relies on pre-test post-test study designs and the implementation of structured intervention techniques, the video data in this thesis captures the participants' naturally occurring
conduct in unfamiliar joint activities. The combination of video data and conversation analysis enables scrutiny of all resources drawn upon in the activities (Mondada, 2018). That is, the richness of video data allows for analysis of not only verbal actions, but also of how the participants make use of embodied actions and engage with artefacts available in the environment. In studies where focus is on the efficacy of structured intervention techniques, assessed through predefined outcome measures of learning, any multimodal and distributed aspects of learning would risk being overlooked.

All included studies in this dissertation combine conversation analysis with descriptive statistics. The use of quantification in interactional research is not always a given procedure (for extensive discussion, see Robinson, 2007; Schegloff, 1993, 2009; Stivers, 2015). For the papers in this thesis, the combination of conversation analysis and descriptive statistics is used to highlight the distributional patterns of interactional findings. A central finding that would have been difficult to demonstrate without this complimentary approach is how rare it was for the cognitively healthy participants to complete an initiated joint project. Indeed, that the caregivers only fulfilled some 10\% of initiated joint projects in the observed directive-response sequences indicates that they oriented to the doing and completion of the participants living with dementia (Study IV).

Returning to an issue raised in the background, namely that experimental studies on learning that are separated from the settings and activities of daily life may be criticized for having low ecological validity (Säljö, 2017). The notion of ecological validity concerns the extent to which the results of a study are applicable to real-life situations. With its focus on naturally occurring social interaction, conversation analysis is argued to warrant the ecological validity of the observed interactional phenomena (Hoey & Kendrick, 2018). Thus, by studying how learning takes place in joint activities through the participants' naturally occurring conduct there-and-then, the findings of this thesis are of high ecological validity.
Dementia and learning

A possible limitation of this dissertation concerns the selection of participants as the initial identification of eligible participants living with dementia was made by the operational managers of the residential care facilities. While the efforts of the operational managers were highly appreciated, they effectively acted as gatekeepers, with a potential power of both excluding and coercing the participation of people living with dementia (Hellström, Nolan, Nordenfelt & Lundh, 2007). The ethical considerations regarding any individuals who agreed to participate are developed in the next section. Considering that I have no knowledge of how many residents declined to participate, and if so, why, there is also a risk of selection bias. That is, the individuals who were identified as eligible participants and agreed to participate may not constitute a representative sample of people living with dementia in residential care facilities.

Another potential, and related, limitation regards the diagnostic accuracy of the enrolled participants. I did not have access to the medical journals of the participants living with dementia, and therefore relied on the diagnostic information provided by the carers. The clinical population of people living with dementia is heterogeneous, and there is always a risk of misdiagnosis (Beach, Monsell, Phillips & Kukull, 2012). While the diagnostic accuracy is uncertain, the participants living in residential care experienced cognitive difficulties that were severe enough to be granted long-term care. This, in combination with the proxy-assessments on current cognitive symptoms, indicated that the everyday functioning of the enrolled participants was comparable.

Ethical considerations

The study obtained ethical approval from the Regional Board for Ethical Vetting at Linköping University (2017/469-31). All physical data, such as written informed consents and proxy-assessments attained through the cognitive impairment questionnaires, were securely stored in a standalone safe at the division. The video recordings were stored on an external encrypted hard drive, as well as on a personal online storage
space hosted by Linköping University. Only researchers involved in the study had access to the data.

In their publication *Good Research Practice* (2017), the Swedish Research Council (SRC) provides guidelines to support scholars in considering ethical issues when planning and conducting research. A first consideration regards the balance between any potential risks for the participants, and potential gains from the study (e.g., in terms of developing existing knowledge and improving methods) (SRC, 2017). In my study, there was no risk of physical harm. However, as is further developed below, there might have been a risk of psychological harm (e.g., in terms of discomfort or confusion about their role as participants in the study) considering the cognitive impairments of the included participants. In general, I argue that the benefits from conducting the study outweighed the risks.

Apart from ensuring that the participants are in no risk of harm, the Swedish Research Council (2002, 2017) stresses an information requirement, and a requirement of attaining individual informed consent from all included participants. As argued by Hellström and colleagues (2007), these ethical requirements are especially challenging in research involving people living with dementia. The information requirement means that the researcher, prior to receiving written consent, should inform all participants about the study, their part in the project, and that their participation is voluntary and could be withdrawn at any time during their participation without stating any specific reasons (SRC, 2002, 2017). In my study all participants were given written and verbal information prior to their participation. Since about half of the included participants lived with dementia, the written information included visual support intended to facilitate understandings (Thorogood et al., 2018). Furthermore, as advocated by McKeown and colleagues (2010), I regarded both the provision of information and the informed consent as a continual process. Therefore, I informed the participants living with dementia about the study, and their possibilities to partake or not, each time I met them. However, it was only during the first meeting with the participants that I asked for their written consent.
The study made use of video recordings, which the participants could have experienced as something uncomfortable. Indeed, the Swedish Research Council (2017) states the following:

Research using a video can intrude on the private lives and integrity of individuals, as it is possible to identify them. Video recording should therefore only be used when it is impossible to achieve the same results with the help of other data collection methods. (p. 27)

Bearing this in mind, in accordance with the information requirement, all participants received detailed information, both verbal and in print, about why video cameras were being used and how the material would be handled. Furthermore, all participants provided written consent to the recordings being made. Neither prior, during, or after the separate video recordings, did any of the included participants indicate or report discomfort with being recorded. Since the participants’ embodied conduct was a focal analytical point in my thesis, the use of video data was considered necessary.

An additional ethical consideration emphasized by the Swedish Research Council (2017) regards confidentiality and taking precautions to protect the integrity and personal information of the participants. As a means of assuring confidentiality, all names, locations and other potentially identifying information have been pseudonymized in print. Further, when frame grabs from the video recordings were used as an analytical point, they were replaced with simple line drawings to minimize the risk of recognizability.
Chapter 5. Summary of studies

Study I.

*A person living with dementia learning to navigate an iPad: a case study.*


Purpose: This study challenges the notion that people living with dementia are unable to achieve novel learning without focused intervention techniques. The purpose of this study is to explore how a woman living with dementia (Alzheimer’s disease) learns to use a tablet computer with support from communicative partners.

Method: The study is based on video recordings and the theoretical framework of learning as changing participation in joint activities. Quantitative and qualitative focus is on changes in the interactional organization over the course of six weeks in the activity of using an augmentative and alternative communication application.

Results: Over time, the participant living with dementia, relies less on the expertise and explicit instructions of her communicative partners when navigating the application, and more on the immediate feedback provided by the tablet computer.

Conclusions: The findings suggest that novel learning still is possible for people living with dementia, even without the implementation of focused interventions. This study further emphasizes the procedural nature of learning for people living with dementia as the woman’s embodied actions were carried out in an increasingly more direct fashion.
Study II.

**People with dementia positioning themselves as learners.**


Recent studies have demonstrated that people living with dementia, contrary to common believes, are capable of novel learning without structured interventions. However, little is still known about the situated practices used in the learning process. With this study we explore how people living with dementia in residential care facilities position, perceive, and assert, themselves as learners in a novel activity. The study is based on video recordings of eight people living with dementia, who for the first time use tablet computers as a social activity on a one-to-one basis with their formal caregivers. Through interaction analysis we show how the participants living with dementia use the engagement displays of *requests*, *accounts*, *formulations* and *metacommments* to make their active undertaking in the ongoing activity public to their communication partner. Our findings suggest that people living with dementia might still perceive themselves as individuals capable of novel learning and that they are active and engaged agents in this process.
Study III.

*Supporting people living with dementia in novel joint activities: managing tablet computers*


A bourgeoning number of studies have demonstrated that people living with dementia are capable of participating in a wide range of everyday activities when supported by care professionals or family carers. However, little is still known about the situated practices used by cognitively healthy individuals to support people living with dementia as active co-participants in novel joint activities. Taking the use of tablet computers as a case in point, this study focuses on the interactional organization of instructions in joint activities involving people living with dementia, who have no previous experiences of touchscreen technologies, and their carers. The study is based on forty-one video recordings of ten dyads, each comprising a person living with dementia and a cognitively healthy individual, as they are using tablet computers with applications suited to individual interests. Drawing on multimodal interaction analysis, we show how the carers continually pursue the accomplishment of their interlocutors, and rarely take over responsibility for closing an ongoing joint project themselves. Our findings suggest that the carers’ instructions, realized as verbal and embodied directives, function as a form of scaffolding practice that facilitates the coordination of visual perception and embodied conduct for the participants living with dementia.
Study IV.

**People living with dementia collaborating in a joint activity.**


Recent research has stressed the collaborative competences of people living with dementia, showing how they are capable of participating in a multitude of everyday activities when supported by cognitively healthy individuals. However, little is known about the collaborative work between different people living with dementia. Accordingly, this study aims to explore how people living with dementia, without the support of a cognitively healthy interlocutor, collaborate with other people living with dementia in an unfamiliar activity. The study is based on video recordings of three dyads, each comprising two individuals living with dementia, as they are using tablet computers with reminiscence and communication aiding applications. Drawing on multimodal interaction analysis, we show how the participants living with dementia treat the activities as joint endeavors and, when needed, engage in problem-solving sequences where they make their knowledge about how to progress within the activities publicly visible to their interlocutor. Our findings suggest that people living with dementia do collaborate with each other, and that the interactional labor between different people living with dementia is more symmetrical than what has been described in joint activities involving people living with dementia and cognitively healthy individuals.
Chapter 6. Discussion

The aim of this dissertation was to study the possibilities for novel learning in everyday activities for people living with dementia, taking the use of tablet computers as a case in point. In pursuing this aim, the following research questions were posed:

(i) How, if it at all, does learning take place in unfamiliar everyday activities, such as using tablet computers, for people living with dementia?

(ii) In what ways, if at all, do people living with dementia assert agency in activities where learning could occur?

(iii) What scaffolding practices, such as locally adapted directives and situated aspects of the physical environment, can be used in learning experiences connected to tablet computers, and how do these facilitate learning?

(iv) What characterizes the interactional organization in dyadic joint activities involving tablet computers when people living with dementia do not have access to support from cognitively healthy individuals?

To address the overarching aim and the encompassing research questions, the main part of this chapter will discuss and synthesize the key findings from the four included studies under the following headings: "Dementia is not a wasteland for novel learning", "The structure of the learning process", "The tablet computer as an object in interaction", and "Agency in learning". First, however, the logical progression across the separate studies is briefly outlined.

The aim of Study I was to examine learning as changing participation in an unfamiliar joint activity detached from structured interventions. In the analysis, focus was on the participants’ interactional organization in managing four returning joint projects on a tablet computer over the course of six weeks. From the results it was clear that learning occurred since the woman living with dementia, over time, became less dependent on the detailed assistance from her interlocutors when
performing an expected action. Given that learning was possible through the participants’ naturally occurring conduct, the findings from Study I functioned as a stepping-stone for the two ensuing papers.

With Study II the ambition was to shed light on the interactional engagement of participants living with dementia in novel joint activities. That is, I wanted to study the doing of people living with dementia in activities where novel learning had been observed. The analysis from Study II stressed how the participants deployed a variety of engagement displays to make their active involvement in the learning process public to their interlocutors. In Study III the analytical focus shifted towards the doing of the caregivers, examining how they supported and enabled the active participation of the individuals living with dementia. Building on a central finding from Study I, namely that the progression through any joint projects was organized around directive-response sequences, Study III highlighted how the carers were attentive to the displayed competences of their interlocutors and would typically upgrade their directives to ensure the doing of the participants living with dementia.

A shared characteristic of the first three papers regarded the asymmetrical distribution of interactional labor between the participants within a dyad, where the cognitively healthy participants would take primary responsibility for structuring and monitoring the unfolding joint activities. By instead examining how the participants with dementia managed the activities together with a peer, Study IV sidestepped the interactional asymmetry from the prior papers.

Dementia is not a wasteland for novel learning

A central question permeating the present thesis regarded whether or not new learning can take place for people living with dementia in the settings and activities of their everyday lives. By stressing novel learning my ambition has been to broaden what has arguably been the dominant focus of previous studies regarding dementia and learning, namely how people living with dementia can retain or relearn familiar skills (cf. Bourgeois et al., 2016; Dechamps et al., 2011; Thivierge, Jean & Simard,
The fact that people living with dementia are able to relearn information and past skills, despite having a progressive neurocognitive disorder, is undoubtedly a valuable discovery that could increase their autonomy and improve their quality of life (de Werd et al., 2013; Poulos et al., 2017). However, with a preoccupation on reablement and containment, possibilities for development and expansion of past, current, or unfamiliar proficiencies for people living with dementia have largely been overlooked in existing research.

Why, then, is it interesting to study novel learning? For me, the importance of exploring novel learning for people living with dementia is twofold. First, I adhere to arguments raised by Formosa (2023), Kydd and Fulford (2020), and Quinn and Blandon (2017) stating that new learning promotes social inclusion, is commonly perceived as a purposeful and meaningful activity in and of itself, and is associated with an increased wellbeing for the individual, irrespective of age and cognitive-communicative capacities. Thus, people living with dementia, whether community-dwelling or living in residential care facilities, should not be deprived opportunities of engaging in novel learning. Second, by studying novel learning as opposed to the relearning of something familiar, the findings of the present thesis contribute to the psychosocial and agency-based approach to dementia studies (cf. Hydén & Antelius, 2017). While opportunities for novel learning vis-à-vis opportunities for relearning are not mutually exclusive, I argue that a focus on the relearning of past proficiencies in a way frames the purpose of learning for people living with dementia as a means to recover one’s old self, the retrieval of something that "went lost" due to dementia. Indeed, showing that people living with dementia, despite having no previous experiences of using touchscreen technologies, do learn to use tablet computers in joint activities with others is in steep contrast to stereotypical portrayals of dementia as an irrevocable loss of functions and identity.

Apart from studying novel learning, an ambition with this dissertation has been to examine possibilities for learning in joint activities that were detached from the experimental settings and structured intervention techniques used in previous research (cf. Duff et al., 2013; Small & Cochrane, 2020; Viccaro et al., 2019). Considering that none of the
Dementia and learning

included participants, that is neither the caregivers nor the individuals living with dementia, received any instructions specifying that they should focus their activities on learning, their conduct was naturally occurring in the settings of their everyday lives. This is in clear contrast to more experimental studies where certain intervention techniques were implemented specifically to promote an exact reproduction of predetermined learning contents. Further, by circumventing the use of set instructions and an outspoken focus on specific learning outcomes, the results from included studies in this thesis are of high ecological validity (Rosenberg & Nygård, 2014). The fact that novel learning is possible for people living with dementia, even without structured interventions is, as far as I am aware, an original finding.

All four papers show that learning takes place for the enrolled participants living with dementia. Importantly, by approaching learning from an interactionist perspective, conceptualizing learning as a social and situated process emerging through changing participation in joint activities (Lave, 2019; Martin & Sahlström, 2010), I demonstrate how learning occurs both during and across the participants’ joint activities. Out of the four included papers, Study I was the most explicit in its focus on changes in participation over time. By examining the interactional organization in reoccurring joint projects over a period of six weeks, it became evident that the participant living with dementia learnt how to perform the basic navigational actions used in the application as she gradually needed less support from her interlocutors in executing the appropriate actions (Study I). On a different timescale, Study II and III highlighted instances of both learning in the moment and learning from earlier occasions. As an example of learning in the moment, our analysis showed that the participants living with dementia could display newfound understandings through formulations of both their own and their interlocutors conduct towards the tablet computers (Study II). Furthermore, the analysis in Study III both showed instances of learning in the moment (e.g., Excerpt 3, line 9) and learning from previous joint activities (Excerpt 5, line 5), where the participants living with dementia initiated and performed actions that provided no grounds for remarks or repair from their interlocutors, that is they were treated as competent participants in the joint activities (Wagner et al., 2018). Notably, learning
Discussion

is not confined to joint activities between cognitively healthy individuals and people living with dementia, but also takes place amongst peers (Study IV). Indeed, since the collection of sequences used for this paper excluded initiatory actions made by caregivers, the progression through ongoing joint activities relied on the displayed knowledge of the participants living with dementia.

To conclude this first section of the discussion, the papers included in the present thesis collectively show that people living with dementia are capable of novel learning, even without the use of specific intervention techniques. Their learning was conceptualized as, and evident in, changes in participation; where the individuals living with dementia transitioned from an inherently dependent position in the unfamiliar joint activities to increasingly active participation. Thus, by acknowledging potentials for development rather than reablement and containment, dementia should not be considered a wasteland for novel learning. The next section will focus on the interactional organization of the joint activities.

The structure of the learning process

Despite the lack of predetermined intervention techniques, and without receiving any information about focusing on learning, the participants in this dissertation structured their joint activities in very similar ways (Study III). I argue that this interactional organization is key to grasp the structure of the learning process in everyday activities for people living with dementia. In this section, I will discuss both what was found to be typical contributions to the ongoing joint activities, and how the participants supported each other in progressing through joint projects.

Indeed, the analyses of all four included papers revealed certain interactional traits that were characteristic for both participants positioned as experts (i.e., typically carers) and participants positioned as novices (i.e., typically individuals living with dementia). In accordance with previous literature concerning joint activities involving people living with dementia and cognitively healthy individuals (e.g., Hydén &
Dementia and learning

Forsblad, 2018; Majlesi & Ekström, 2016), the findings from Study I and Study III highlighted how the carers took on primary responsibility for both initiating and monitoring the subsequent progression through any joint projects. Notably, the caregivers rarely engaged hands-on with the tablet computers, but would instead orient towards the doing of the participants living with dementia as the focal task at hand (Study III). This finding differs from other dementia-studies focusing on joint activities such as preparing meals (e.g., Hydén, 2014; Majlesi & Ekström, 2016), managing personal hygiene (e.g., Jansson & Plejert, 2014; Roth & Reichertz, 2020), and mobility practices (Majlesi et al., 2021) where carers usually would take active part in the physical doing of any joint projects. In a nutshell, then, the contributions of the cognitively healthy participants in the present thesis consisted of step-by-step instructions produced as verbal and embodied directives. One of the main arguments from Study III is that the carers' directives function as a form of scaffolding (Wood et al., 1976), facilitating the coordination of visual perception and embodied conduct for the participants living with dementia. By including verbal or embodied cues specifying the what, how and where of subsequent expected actions, the carers' directives were often formulated in a way that left little room for misunderstandings. If, however, an initiatory directive did not lead to completion of the current joint project in the next turn, the carers would reissue, or upgrade, their directives with verbal or embodied cues that were absent from the initial turn (Study III). Thus, the findings from the third paper stress that both professional and family carers go to great lengths to ensure the active involvement of people living with dementia in novel joint activities.

At a first glance, the scaffolding procedure described above might seem unilaterally realized by the cognitively healthy participants. However, through the included studies I demonstrate how the participants living with dementia actively support their interlocutors in guiding them. Following the results from Study I, showing that novel learning is possible through repeated participation in joint activities, my aim with Study II was to understand how people living with dementia engaged in these unfamiliar activities. The analysis revealed that rather than being passive onlookers, when faced with a problem outside the scope of their displayed capabilities, the participants living with dementia would explicitly
request information from their interlocutors about how to proceed within the current joint project. That the participants living with dementia requested information about the performance of a next action occurred both in first position (i.e., when initiating a new joint project) and in second position as a response to a preceding directive (Study II). Other means of displaying their situated understanding of the ongoing joint activity included providing accounts for not being able to perform an expected action (e.g., Excerpt 3 in Study II), and requesting confirmation regarding enacted gestures above the screen (e.g., Excerpt 3 in Study III). By making their situated understandings of any current joint project publicly visible to their interlocutors, the participants living with dementia could effectively solicit the information needed to progress within the joint activities. Collectively, the four papers included in this dissertation emphasize that people living with dementia assert themselves as active co-participants in novel joint activities. Thus, the scaffolding process is a collaborative endeavor where the participants work together in managing, and making sense of, the tablet computers. Again, this finding clearly contrasts with stereotypical notions regarding people living with dementia as passive and uninvolved participants in interaction (cf. Hellström et al., 2007; Kontos, 2005).

The use of scaffolding as a metaphor for the ways in which more experienced individuals may structure joint activities in order to facilitate participation and promote learning of those with less experience has been widely adopted in previous studies (e.g., Sellberg & Lundin, 2017; van de Pol & Elbers, 2013; Weddle & Hollan, 2010). From the results in the papers included in this dissertation it is clear that the caregivers’ use of directives effectively scaffolded the participation of the individuals living with dementia. Furthermore, the carers were attentive to the displayed competences of their interlocutors as their directives would contain fewer, if any, descriptive cues when the participants living with dementia exhibited signs of having learnt how to perform the requested action (cf. the use of truncated directives in Broth et al., 2017). By continually orienting to the doing of the participants living with dementia and evaluating their subsequent performances (Study I and Study III), the carers are framing the very purpose of their activities as centering around learning. Considering that the only instruction given to
Dementia and learning

the participants prior to their enrollment was to record themselves while using any applications best suited to their interests, I find the framing of the activities to be an interesting and unexpected finding. Moreover, stressing the situated and relative nature of knowledge displays in interaction (Stivers et al., 2011), the results from Study IV showed that in the absence of support from professional caregivers, participants living with dementia could provide scaffolding to their peers.

Taken together, the results from the included papers indicate that the enrolled participants, whether living with dementia or not, oriented towards learning as an outcome of their ongoing joint activities. Further, I found that the interactional organization within the examined joint activities generally followed a structure of directive-response sequences. Within these sequences, the participants actively supported the contributions of each other by publicly displaying their situated understanding of their ongoing joint activities. The discussion in the following section will target the tablet computers as objects in interaction.

The tablet computer as an object in interaction

According to Nevile and colleagues (2014), "objects’ availability, and the access to and control of objects, can influence the ability to participate, or how participants negotiate and coordinate their use or orientation to objects" (p. 14). As the interactions examined in this thesis are undeniably object-centered, I find it essential to briefly discuss the role that the tablet computers have for the unfolding joint activities.

A first observation is that the tablet computers effectively served as anchor-points for the participants' joint attention. While sustained attention is a cognitive domain commonly affected by dementia (Kolanowsky et al., 2012), the participants included in this dissertation showed no signs of disengagement from their ongoing joint activities. In fact, it was rarely the case that the participants within a dyad gazed at each other during an ongoing activity but would instead keep their gaze fixated on the tablet computers. Even though the participants would only occasionally face each other, and engage in a mutual gaze, they were by
Discussion

no means inattentive to each other’s embodied conduct. By gazing towards the device placed in front of them, the participants within a dyad not only had a shared field of vision, but also access to a shared *semiotic field* allowing them to closely monitor each other’s embodied conduct and make sense of any actions towards the tablet computer (Goodwin, 2018). Thus, whether being haptic actions, pointing gestures, or enacted gestures carried out above or in close proximity to the screen, the tablet computers became a resource for the production of environmentally coupled gestures (Goodwin, 2007). I argue that the production of embodied conduct within a shared semiotic field, with environmentally coupled gestures towards the tablet computers, transformed the unfamiliar and ostensibly complex joint activities into something rather concrete and tangible for the participants living with dementia. That is, being an object-centered activity, the production of environmentally coupled gestures enabled sustained attention, increased the intelligibility of the carers’ directives, and made it possible for the participants living with dementia to publicly display their understanding of the ongoing joint activities.

A second observation is that not all instructions needed to partake in the activities was to be found from participants positioned as experts, but could also be provided by the tablet computers. As an example, the applications often included written on-screen instructions containing an overview regarding the possibilities or functionalities of the specific application. That is, depending on application-layouts, the tablet computers could support the participation of any involved individuals by providing some basic structure to an ongoing joint activity. However, as argued in Study IV, apart from *not responding*, the tablet computers were not able not provide the participants with any feedback following inadequate haptic conducts towards the screen. While the absence of immediate feedback from the devices was at times met with frustration, especially when their conduct was seemingly performed in an appropriate way (e.g., line 11, Excerpt 5 in Study III; line 21, Excerpt 6 in Study IV), the nonresponse could be what triggered additional, and often slightly modified, attempts to progress within an ongoing joint project. Taken together, the findings from the included papers indicate that whereas the interface of selected applications could facilitate the participants in
Dementia and learning

initiating new joint projects (e.g., in terms of listing options of available media contents), the fine-grained details of the haptic conduct towards the touchscreen was best elaborated through interaction with others via multimodal instructions (Study I and Study III) or problem-solving sequences (Study IV).

Considering that the tablet computers and the selection of preinstalled applications were what constituted the joint activities in this dissertation, the role of the tablet computers as objects in interaction was pivotal and indeed intertwined with the situated practices of the included participants. As discussed above, when examining the tablet computers as isolated objects in interaction, the interface of applications and haptic limitations of the touchscreens had both facilitating and impeding potentials for the progression of an ongoing joint activity. When examined as part of the joint activities, however, any difficulties in managing the tablet computers were resolved through the situated negotiations of the involved participants. In conclusion, the findings from the included papers corroborate a central notion from a participationist view on learning, namely that learning is a process distributed amongst individuals acting in concert with one another and any objects in the ongoing activity (Lave & Wenger, 1991; Sfard, 2008; Säljö, 2017). In the next, and final, section of this chapter I will discuss agentive aspects of learning for people living with dementia.

Agency in learning

The importance of agency is foundational within sociocultural and situated perspectives of learning (Mäkitalo, 2016). Broadly defined, agency can be comprehended as an individual’s ability to initiate social action, intervene in, and transform the meaning of situated activities (Linell, 2009; Enfield, 2011b). Indeed, when conceptualizing learning as changing participation in joint activities, stressing the active and increased involvement of participants engaged in joint activities, the significance of agency becomes clear. However, since the notion of agency is strongly associated with an individual’s cognitive and communicative capacities, the progressive neurocognitive decline of dementia has contributed to
Discussion

presumptions about people living with dementia possessing diminished or none-existing agency (Boyle, 2014; Kontos, 2005). Recent studies, though, dismiss this stereotypical assumption and show that people living with dementia can exercise agency all throughout the progression of their disease, including during late stage dementia (Clare et al., 2020; Hydén, Majlesi & Ekström, 2022; Isaac & Hamilton, 2019). In this concluding section of the chapter, I will discuss results from the four papers included in this thesis to show how the participants living with dementia were able to claim and display their agency in the ongoing joint activities.

Given the aforementioned definition of agency, a sequence-initiating action may be regarded as the prototypical position in interaction for an individual to exert agency. Throughout the video recordings collected for this thesis, there are numerous instances in which a participant living with dementia displays his or her agency by initiating a new joint project. This finding is, however, poorly reflected in Study I where we only included progression through four specific joint projects, and in Study III where the focus was on directive-response sequences. Instances of sequence-initiating actions by participants living with dementia were, however, present in both Study II and Study IV. The aim of Study II was to examine how people living with dementia may position themselves as learners in unfamiliar activities, and a first example displaying the assertion of agency through sequence-initiating actions can be found in the participants’ use of requests. By requesting information about how to perform a specific action (e.g., how to delete a letter in a crossword puzzle, Excerpt 1), the participant living with dementia publicly displays the limits of his or her current understanding (cf., knowing what you don’t know, Koole, 2012), and asserts agency in controlling the trajectory of the unfolding joint activity to meet this request. Moreover, through their use of metacomments, the participants living with dementia asserted agency in introducing learning as a conversational topic (e.g., Excerpt 7) and thereby changing the course of talk previously initiated by their interlocutors (Isaac & Hamilton, 2019).

I argue that the richest findings contradicting the presumption that people living with dementia possess weak or no agency are found

61
The results from the fourth paper showed instances where a single participant living with dementia both initiated and carried out new joint projects (e.g., Excerpt 1), and instances where the participants would initiate a joint project and subsequently orient to the doing of their interlocutor (e.g., Excerpt 4). Indeed, if people living with dementia solely relied on the agency of cognitively healthy interlocutors, any progression made within the observed joint activities in Study IV would have been little to none. By initiating joint projects, orienting to the doing of their peers, and offering assistance in problem-solving sequences, the enduring agentive abilities of the participants living with dementia are clearly demonstrated and enable them to manage an unfamiliar activity without constant support from carers.

While sequence-initiating actions are clearly agentive in that they set the course for the ensuing interaction, participants may also exercise agency in their response to the preceding turn at talk (Clayman, 2013; Isaac & Hamilton, 2019; Mikesell, 2010). Again, through their use of requests, which were typically produced with environmentally coupled gestures, the participants living with dementia could explicate their understanding of the prior turn and thereby influence the subsequent actions of their interlocutors. From the analysis of Study III it became evident that the agentive assertion within requests to a preceding directive would lead to upgraded directives that subsequentially enabled the participant living with dementia to carry out the expected action (e.g., Excerpt 3). Furthermore, the participants living with dementia asserted agency in the ongoing joint activities through sequences of self-initiated repair attempts followed by mitigating accounts (e.g., line 7-9, Excerpt 3 in Study II; line 10-13, Excerpt 5 in Study III). Through the combination of self-initiated repair attempts and mitigating accounts, the participants displayed an ability to actively monitor and regulate their actions, and further justify their conduct even when the repair attempt was unsuccessful.

In conclusion, the results from this thesis support the findings of recent literature acknowledging the agency of people living with dementia. The analyses of the included papers emphasize how the participants living with dementia were active and engaged throughout the ongoing
Discussion

joint activities, and asserted their agency through a wide variety of means. Indeed, the enduring agency displayed by the participants living with dementia is arguably at the very core of the learning process since it enabled them to influence and take co-ownership of the unfolding joint activities.
Chapter 7. Implications

In this final chapter, the findings from the dissertation are discussed in terms of their implications. The implications listed below are of relevance for policymakers, care professionals and activity coordinators working within residential or home-based care, software developers, speech-language pathologists, as well as people living with dementia and their next-of-kin. The chapter is concluded with implications and suggestions for future research.

Implications for practice and policy making

As noted by Quinn and Blandon (2020), people living with dementia are essentially absent in existing studies and policy agendas on lifelong learning. The notion of lifelong learning is broadly defined as a process which involves all learning activities, whether formal or informal, operating throughout the entire lifespan, and aiming to improve and develop individual capacities, knowledge, and competencies (UNESCO, 2017). In a recently published Swedish state public report (SOU 2019:69), the need of a national strategy ensuring possibilities for lifelong learning is proclaimed, stating that "Technological developments give rise to changing competence needs and thus an increased need for lifelong learning. The national policy in the areas of education, labor market and industrial policy must be better coordinated to meet the needs in the area of skills supply" [Teknikutvecklingen medför ändrade kompetensbehov och därmed ökade behov av livslångt lärande. Den nationella politiken inom utbildnings-, arbetsmarknads- och näringspolitikens områden behöver samordnas bättre för att möta behoven på kompetensförsörjningsområdet] (p.31). While stressing lifelong learning, the focus of the report is on individuals of working age, with no mentions of people above the age of retirement, let alone older adults living with cognitive decline. Since life rarely ends at the age of retirement, an implication for policymakers would be to acknowledge, promote and consider opportunities for lifelong learning also for older adults and people living with dementia.
In another Swedish state public report on the use of welfare technologies in elder care services, the implementation of tablet computers is raised as a means for facilitating the societal inclusion of older adults (SOU 2020:14). Moreover, the authors of the report claim that "For diseases that entail cognitive decline over time, e.g. dementia, it is crucial that new technologies are implemented as early as possible" [Vid sjukdom som ger kognitiva nedsättningar över tid, t. ex. demens, är det nödvändigt att ny teknik tränas in så tidigt som möjligt] (SOU 2020:14, p. 536). While the findings from the present thesis (of course) should not be used as an argument against an early implementation of technological solutions for people living with dementia, the emphasis on prompt intervention is indeed challenged. Consequently, an implication for both professional or family carers is to not be discouraged from introducing information and communication technologies during the later stages of dementia.

Possibilities for learning in residential care facilities are associated with increased social participation, lower rates of agitation, and an enhanced self-reported quality of life. According to Formosa (2023), however, opportunities for novel learning during long-term care are generally scarce. Formosa (2023), further argues that "while funding is the most commonly quoted issue in blocking provision for fourth age learning, negative attitudes and ageism are more likely to be the reasons for limited availability of learning in the fourth age" (p. 1141). The results from the papers included in this thesis show that learning for people living with dementia takes place through the participants' naturally occurring conduct in joint activities. Considering that novel learning could emerge from participation in any unfamiliar activity, and without carers receiving training on how to implement specific interventions, an implication from this thesis is that opportunities for learning do not have to be costly or complicated endeavors.

Building on the previous point, the findings from this dissertation emphasize the enduring agentive abilities of the participants living with dementia. Thus, since novel learning requires exposure to unfamiliar activities, a further implication for caregivers is to acknowledge and tend to the agency possessed by people living with dementia by actively
Implications

including them in selecting meaningful joint activities. Moreover, seeing that learning takes place both during and across joint activities, even occasional opportunities for novel learning may be regarded as valuable and worthwhile for people living with dementia.

A central finding from this thesis is that the use of structured intervention techniques is not decisive for learning to take place. As raised in the discussion, however, the ongoing joint activities are structured in similar ways and mainly progress through directive-response sequences. The analysis of close to 300 directive-response sequences showed that multimodal directives specifying what, how and where to engage with the tablet computers enabled people living with dementia to aptly partake in the activities. Therefore, an implication regarding instructional activities involving people living with dementia is to not underestimate embodied aspects of learning.

From the collection of video recordings there were some reoccurring problems amongst the dyads in managing the tablet computers and the included applications. Accordingly, the findings could yield important implications for software developers to better meet the needs of a heterogenous user group. One example of a frequently observed problem is that the participants living with dementia would engage with unresponsive or "non-pressable" objects on the touchscreen. The issue of tapping on an area of the screen without having any subsequent action taking place, that is there was no response to the initiative taken by the person living with dementia, is seen throughout the data in most, if not all, included applications. According to Norman (2013), good design in technologies should communicate to the user if something goes wrong by highlighting the problem and informing the user on how to solve the issue. As raised in the discussion chapter, these problems were typically solved either through the participants' self-initiated self-repairs or through the provision of upgraded directives from the caregivers. However, an implication for software developers working with applications targeting people living with dementia could be to add signifiers (Norman, 2013) indicating where plausible next actions could take place. This could be done through means such as circling or highlighting current options after repeated unsuccessful attempts from the user.
Dementia and learning

While memory deficits may be regarded as the most distinguished symptom of dementia, communicative difficulties due to the disease have been reported as one of the main challenges for people living with dementia and their next-of-kin (Ekström et al., 2017). In the clinical assessment and subsequent intervention of communicative disorders, the expertise of speech-language pathologists constitutes a valuable resource. In the Swedish healthcare system, however, people living with dementia rarely get access to the services provided by speech-language pathologists. Indeed, according to the Swedish Dementia Registry (SveDem, 2021), clinical assessments involving speech-language pathologists only amount to some 3% within specialized dementia units (as compared to 65% involving occupational therapists). The findings from this thesis show that people living with dementia can learn to use unfamiliar technologies, and actively engage with applications intended to support communication such as CIRCA and CIRCUS. Therefore, there are rich potentials for speech-language pathologists to work with people living with dementia clinically, and implement dedicated augmentative and alternative communication solutions.

Implications for future research

The findings from the four included studies in this dissertation show that novel learning is possible for people living with dementia participating in recurring joint activities. Apart from being a collaborative endeavor, I have demonstrated how the participants' embodied engagement in the ongoing activities, and their enduring agency are central aspects of the learning process. However, none of the enrolled participants were in the late stage of dementia. To my knowledge, there are to this day no studies focusing on learning for people living with late-stage dementia. Considering how both procedural memory and agentive abilities may be relatively intact throughout all stages of dementia (e.g., Hydén et al., 2022; Keith et al., 2022), future research on learning for people living with late-stage dementia is warranted.

While the data used for this thesis was longitudinal, the course of the participants' involvement was limited to a period of four to six
Implications

weeks. An ambition with this thesis was to do a follow-up study approximately one year after the participants’ initial enrollment, however the COVID-19 pandemic deemed this impossible. Accordingly, more research is needed to explore the long term effects of learning for people living with dementia.

The results from Study IV showed that people living with dementia can support each other in unfamiliar joint activities. By both soliciting and offering assistance during problem-solving sequences, the participants publicly displayed their situated knowledge of the joint activities. That people living with dementia position themselves as qualified participants, capable of sharing their knowledge to others is a valuable finding that should be examined further. Indeed, an implication for future research is to observe activities wherein participants living with dementia exhibit expertise and may share their knowledge to not only other people with dementia but also cognitively healthy individuals.

Throughout Swedish municipalities, residential eldercare services are rapidly increasing the use of tablet computers as a means to promote social inclusion (Swedish National Board of Health and Welfare, 2021). However, to my knowledge, there are no exploratory studies on how tablet computers are being implemented within the eldercare organizations. Thus, a comprehensive overview of the ways in which tablet computers are currently being used, if at all, is warranted.
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CASE REPORT

A person living with dementia learning to navigate an iPad: a case study

Elias Ingebrandb, Christina Samuelssonb, and Lars-Christen Hydenc

aDivision of Ageing and Social Change, Linköping University, Linköping, Sweden; bCenter for Dementia Research (CEDER), Linköping University, Linköping, Sweden; cDivision of Speech Language Pathology, Audiology and Otorhinolaryngology, Linköping University, Linköping, Sweden

ABSTRACT

Purpose: This study challenges the notion that people living with dementia are unable to achieve novel learning without focused intervention techniques. The purpose of this study is to explore how a woman living with dementia (Alzheimer’s disease) learns to use a tablet computer with support from communicative partners.

Method: The study is based on video recordings and the theoretical framework of learning as changing participation in joint activities. Quantitative and qualitative focus is on changes in the interactional organization over the course of six weeks in the activity of using an augmentative and alternative communication application.

Results: Over time, the participant living with dementia, relies less on the expertise and explicit instructions of her communicative partners when navigating the application, and more on the immediate feedback provided by the tablet computer.

Conclusions: The findings suggest that novel learning still is possible for people living with dementia, even without the implementation of focused interventions. This study further emphasizes the procedural nature of learning for people living with dementia as the woman’s embodied actions were carried out in an increasingly more direct fashion.

IMPLICATIONS FOR REHABILITATION

- For people living with dementia, learning in everyday activities is facilitated by repeated exposure to the activity and the scaffolding practices of a more experienced communicative partner.
- In instances of novel learning, one should not underestimate the importance of embodied engagement from people living with dementia.
- Care professionals need to worry about exposing people living with dementia to unfamiliar activities.

Introduction

People living with dementia are often faced with unquestioned assumptions about their cognitive and social capacities, or rather lack thereof, as a result of the diagnostic label and its clinical connotations [1]. Cognitive and social capacities that are commonly perceived as being insufficient in people living with dementia are, among many, their capability to cooperate in interaction [2], sustain attention and engagement in activities [3], take communicative initiatives [4] and learn or re-learn information and skills [5,6]. With evidence of clear decline in memory functions being one of the diagnostic criteria for mild or major neurocognitive disorder due to Alzheimer’s disease [7], there is a vast body of experimental research on how dementia, especially Alzheimer’s disease, affects learning [8–10]. In the early stages of Alzheimer’s disease, the memory impairments mainly affect declarative memory functions, whereas procedural memory functions usually remain preserved [11]. The primary focus of studies regarding learning and dementia has been on teaching the person with dementia through implementing specific, or combined, intervention techniques intended to facilitate learning. Some recoupling interventions include errorless learning [12,13], spaced retrieval [14,15], and vanishing cues [16,17]. Errorless learning aims at preventing the person living with dementia from making any errors in performing the task at hand. It is argued that avoiding errors in the learning process, through means such as immediate correction in the light of a possible error, will minimize the risk of incorrect learning [12]. Spaced retrieval is a technique where the person living with dementia is asked to recall targeted information, such as object naming, with gradually expanded intervals. If the desired information is not recalled the correct answer is provided and the interval is reduced until the learner manages to recall the information [18]. The vanishing cues technique has mainly been used in studies focusing on face-name associations. In these studies, pictures of faces with a corresponding name are presented, and the person with dementia is asked to recall the name. Initially, the names are completely spelled out, and over subsequent presentations, the letters are removed one at a time from right to left until the person is able to recall the name with minimal cues [19].

While these studies unanimously report that learning still is possible for people living with dementia given focussed and structured interventions, few studies address novel learning in
everyday life of people with dementia. By studying learning in everyday life, one circumvents the experimental context that is usually applied and attains access to learning trajectories of high ecological relevance [20]. Moreover, in most experimental studies, the organization of the learning process in terms of the inter-action between the learner and the “expert” has not been studied. A focus on the organization of the learning process could help us to understand how people living with dementia for instance take over some of the actions proposed by the “expert” and execute these by themselves.

**Learning and participation**

Theories of learning in everyday life regard learning not as something restricted to situations of structured teaching or something explicitly located in the mind of the individual learner. Instead, learning is considered a process intrinsic to all activities of everyday life and distributed amongst individuals acting in concert with each other and any artefacts in the environment [21,22]. As such, learning is closely tied to collaboration and interaction. Learning could further be considered to be a process that unfolds over time, a process that can be conceptualized as a change in the participation in situated joint activities [23–25].

With the centrality that interaction has for learning, Wagner, Fekarker, Doehler and Gonzalez-Martinez [26] argue that a systematic analysis of change in interactional patterns is crucial in order to understand changing participation in activities of everyday life. To take part in activities with others is to engage in what Clark [27] calls joint activities. Joint activities, in turn, usually comprise several smaller joint projects [28]. The joint activities consist of embedded joint projects, and progress incrementally through new contributions made by each individual participant engaged in the activity. The contributions are produced in relation to the ongoing joint project, that is the participants collaborate and coordinate their contributions to achieve a mutual understanding sufficient enough for current practical purposes [29,30].

Each contribution builds on, and adds to, the participants’ common ground, that is their shared interactional history [20]. When a contribution signals uncertainty, indicating insufficient understanding, the participants jointly engage in a problem-solv-ing process or repair work to reach a mutual understanding suffi-cient enough for the activity to proceed [31,32]. In this fashion, conduct is treated as unproblematic when contributions provide no need for repair work [26,27].

Much of the contemporary theories on learning as changing participation draw influence from the sociocultural perspective originally proposed by Vygotsky [33]. According to Vygotsky’s [33] idea of the zone of proximal development, learning is seen as dependent on participation involving more experienced members of a community. In interaction more experienced individuals, the “experts”, are capable of structuring activities in ways that enable less experienced individuals, the novices, to participate (also see [28]).

While most joint activities build on some type of asymmetrical relationship between the participants in regard to either knowl-edge or communicative labour [34], this asymmetry might be especially prominent in interactions involving cognitively healthy people and people living with dementia [4]. Hyden [35] argues that cognitively healthy interlocutors can compensate for the pro-gressive cognitive and communicative challenges associated with dementia by contributing more in joint activities. This can be done by taking more responsibility in planning activities, engag-ing in advanced repair work and keeping track of already accomplished projects embedded in the activity. Further, to com-pensate for a potentially diminished attention span the use, and placement, of relevant artefacts in the environment can aid sus-tained interaction [35,36]. By providing appropriate support the joint activity is scaffolded, enabling the person living with dementia to participate in ways he/she could not do otherwise [2].

Thus, in order to study learning in everyday life it is necessary to capture changes in participation in joint activities, something that can be done by scrutinizing similar sequences occurring over a stretched period of time [30,37]. Clark et al. [28,38,39] as well as Knutson et al. [32] have shown how cognitively healthy people participating in repeated trials of matching tasks gradually need less time, use fewer turns, and also less words to complete joint projects. While these studies are all experimental they show how common ground, over time, accumulates making extended negotia-tions less necessary. Put differently, the distance between the “expert” and the “novice” has diminished with the novice’s grad-ual growth of involvement in the activity [21,36]. To our knowl-edge there are no studies to date exploring novel learning and interaction in everyday life as changing participation in joint activ-ities for people living with dementia.

Building on this line of argument, the aim of this article is to explore learning as an everyday activity detached from formal interventions in experimental settings through focussing on the case of learning to handle a tablet computer (henceforth referred to as iPad). Specific interest is on the interactional organization of the learning process.

**Materials and methods**

In order to explore the possibilities of this theoretical framework a case study design has been used. The study is based on video data recorded in the home environment of a woman (Ida), 52 years old, diagnosed with Alzheimer’s disease roughly one year before data collection started, and her cognitively healthy hus-band (Max). The data was collected as part of a project aiming to evaluate the use of a personalized communication application for an iPad [40]. The original study had no focus on learning and the only instructions given to Ida and Max was to record themselves using the application. No formal testing was carried out to assess Ida’s level of cognition, speech or language prior to her participa-tion in the study. Though the couple reported that they experi-enced great communicative difficulties relating to Ida’s expressive and receptive language abilities. Further, Ida showed clear difficul-ties with episodic memory.

The data used in this study comprises five recordings collected over the course of six weeks. The first four recordings are of Ida and Max whilst the last recording is of Ida and Unni, a researcher who participated in the original study. Each recording is of the participants interaction using an iPAD and the application GoTalk NOW. GoTalk NOW is a customizable application developed to function as an augmentative and alternative communication device. The application is designed to work like a communication book and can be suited to the individual user with personal pic-tures or video clips, and a possibility for written information com-pleting each item. GoTalk Now is “layered” in the sense that there is a home screen with 1–25 items or categories and after selecting a category the application proceeds to a new screen with a similar structure but containing items adherent to the spe-cific category. Apart from navigation in subordinate screens, by tapping on a specific category, one can navigate to a preceding screen by tapping a backwards arrow at the bottom left hand cor ner of the application or go directly to the home screen by
tapping on a symbol of a house which is located next to the backwards arrow.

The methodological point of departure is informed by practi-

cies of conversation analysis and interactional analysis based on
detailed transcriptions of the couple’s verbal and non-verbal con-
tributions to the unfolding activities. In accordance with the stud-
ies by Linell as well as Clark et al. [28,30,34,38] presented earlier,
the participants’ number of turns, words and time used in com-
pleting joint projects were quantitatively measured. In the ana-
lysis, a joint project was considered to start with an initiative by
one of the participants, and considered completed when the pro-
posal of a new project takes place [27]. A turn was defined as a
speaker’s continuous verbal or embodied contribution to the
ongoing discourse [44,41]. When quantifying, the definition of a
word was based on spoken language where contractions such as
"wanna" (want to) counted as one word, as did backchannel
responses such as "uh". All excerpts presented in this study are
translated from Swedish to English.

Following the methodological requirements when studying
learning posed by Koschmann [37] and Linell [30,42], sequences
of reoccurring joint projects within and across the different
recordings were chosen for further analysis. More specifically,
instances of (i) unlocking the iPad \((n = 46)\), (ii) navigating to the
home screen \((n = 6)\), (iii) navigating to the preceding screen
\((n = 20)\) and (iv) closing the application \((n = 3)\) were selected. As
a whole, the data inevitably comprise more joint projects than
those selected for further analysis. The selection was limited to
local projects where novel learning could occur. Apart from
receiving a short introduction on how the iPad and application
worked prior to their participation, neither Ida nor Max had any
previous experience of using tablet computers. As such any devel-


The iPad unlocks through a feature called
"Unlocking the iPad.

Excerpt 1

The iPad unlocks through a feature called "Slide to unlock". This
means that prior to starting the application the participants have
to press the physical home button located in the frame of the
iPad and then drag a slider that appears onscreen to the side.

When the fifth recording started, the iPad was already unlocked,
hence the results reported bellow are from the first
four recordings.

Table 1 presents an overview of the quantitative measures
depicting Ida’s and Max’s interaction when completing the local
project of unlocking the iPad. Notably, in the first three recordings
of our data there is a clear decrease in the time needed to unlock
the iPad. Similarly, the number of turns required to complete the
project is considerably fewer in the third recording. In the fourth
recording, there is a steep increase in both time and turns
needed. However, as is discussed later, there is a noticeable
change in the participants’ interactional organization also in this
final instance. That Ida, over time, relies less on the expertise of
Max is clearly seen in the following two excerpts.

During the first week, neither Ida nor Max show any clear signs
of expertise in how to unlock the iPad. As Excerpt 1 shows, the
local project is initiated by Max producing the recognition check
(lines 1 and 3), "do you remember how to start this gizmo now
again". Ida responds to this by stating that she does not know
how to start the device (line 4–7). Nevertheless, Ida simultan-
eously responds by pressing on the physical camera (line 6). Here,
Max does not pursue the project through subsequent instructions,
as is the case in future instances, but instead attempts to unlock
the iPad himself (line 10–16). Max first repeats what Ida already
tried, that is pressing on the camera lens (line 12), and then after
picking up the iPad and scrutinizing it suggests that it might be
dead (line 15). After pressing the physical home button (line 16),
Max explains how one should do this (line 17), to which Ida
responds with a request for clarification "what did you say" (line
18). Max then repeats his explanation with an adherent pointing
gesture (line 19). Following an additional request for clarification
from Ida (line 20–21), during which the screen goes black, Max
affirms Ida’s request with a “yes but” construction and thus
refrains Ida from further action. Upon this, the project gets inter-
rupted and continues in line 27 with Max producing the impera-
tive “then we drag it to the side” with an accompanying iconic
swipe gesture. With no response from Ida, Max reframes his di-
rective with additional information “you just drag on the glass in
one direction” (line 28) to which Ida complies. During the follow-
ing 8 s’ (line 30–35), two similar sequences occur after which Max
himself swipes his finger across the screen and realizes that the
screen is not active (line 36). Max subsequently points to the
physical home button and tells Ida to start the device again to
which Ida responds with a request for clarification and does not
press the button until after Max reassures her (line 37–40). The
project is ultimately completed with Max unlocking the iPad
(line 45–46).

During the second week, the project unfolds in a similar fash-
ion with Max pursuing the completion of the project through ver-
bal and embodied directives towards Ida who often responds
with requests for clarification. However, unlike the first recording
the project is ultimately completed by Ida

In the third recording (Excerpt 2) the project is again initiated
by Max (line 1). Ida responds to Max’s initiative by pressing on
the physical home button (line 2) without any preceding explicit

### Table 1. Quantitative measures – unlocking the iPad

<table>
<thead>
<tr>
<th></th>
<th>Number of turns (M/I)</th>
<th>Max, Words (%)</th>
<th>Ida, Words (%)</th>
<th>Max, Words/h</th>
<th>Ida, Words/h</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>First week</td>
<td>29 (15/14)</td>
<td>103 (74.1)</td>
<td>36 (25.9)</td>
<td>6.87</td>
<td>2.57</td>
<td>73 s</td>
</tr>
<tr>
<td>Second week</td>
<td>34 (17/17)</td>
<td>81 (57.9)</td>
<td>59 (42.1)</td>
<td>4.76</td>
<td>3.47</td>
<td>43 s</td>
</tr>
<tr>
<td>Third week</td>
<td>8 (4/4)</td>
<td>20 (58.8)</td>
<td>14 (41.2)</td>
<td>5</td>
<td>3.5</td>
<td>11 s</td>
</tr>
<tr>
<td>Fourth week</td>
<td>26 (13/13)</td>
<td>69 (60.5)</td>
<td>45 (39.5)</td>
<td>5.31</td>
<td>3.46</td>
<td>82 s</td>
</tr>
</tbody>
</table>

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Excerpt 1. Unlocking the iPad, first week

01 M: >let's see< Ida ((sits down in a chair next to Ida)) (do you
02 I: *"yea"
03 M: remember how to start this gizmo now again. hh
04 I: -no? ((leans towards the iPad, drags her hand across the screen
to remove some dust)) I do not remember that (1.8) "no" I
05 (presses the camera lens at the frame of the iPad)) do not
06 know at all
07 M: no
08 I: .no
09 M: should we try to? ((swipes his finger across the screen))
10 I: yea
11 M: to see if we can (presses the camera lens and quickly swipes his
finger back and forth across the screen) start this one
12 I: yea
13 M: hh ((picks up the iPad and turns it around) maybe it's dead
14 (2.7) (presses the physical home button and the screen lights
up) press that button there ((puts the iPad in front of Ida))
15 I: what did you say
16 M: you pressed on that button there ((points at the button))
17 I: "oh" ((holds her finger above the button)) is it that one that
18 I should press on then ((the screen goes black))
19 M: when we should start it. but now it's turned on,
20 I: oh
21 M: yea (0.7) no kitty ((gets up from the chair and steps outside
of the field of recording))
22 (Max returns to his chair after 10.6 seconds)
23 M: and then we drag it to the side? ((does a swipe motion in the
air in front of himself)) (0.8) you just drag on the glass (0.5)
24 I: "yea" ((swipes her finger across the screen))
25 (1.2)
26 M: the other direction
27 I: yea ((swipes her finger in the opposite direction))
28 M: drag li- ((does a swipe motion in the air))
29 I: (Swipes across the screen)
30 M: ((Max swipes across the screen)) no? it has turned off itself
31 »then you< ((points at the button)) have to start it again
32 I: ((holds her finger above the button)) (2.0) is it there?
33 M: yes it is [that button, there
34 I: (((presses the button and the screen lights up)) yea
35 M: ((points towards the screen)) and then (0.4) we'll see what is
36 written here .hh
37 (1.0)
38 I: [ten fifty seven
39 M: ((Max swipes across the screen towards himself then in the
other direction whereby the iPad is unlocked))
40

Excerpt 2. Unlocking the iPad, third week

01 M: should we start to view th[ing now,
02 I: *"yea"* right* ((presses the
03 physical home button and the screen lights up)) it was that one
right?
04 M: m and then ((does a swipe motion in front of himself))
05 I: one should go back :right? ((swipes back and forth above the
screen))
06 M: you drag it in >'that direction" ((swipes in front of himself))
07 ((swipes across the screen and the tablet unlocks)) there-
08 I: *there we go.*
09 I: *yea*
verbal or deictic clue from Max. While Ida does produce a request for clarification with "it was that one right" (line 3–4), she executes the action before Max confirms her question. In line 6 Ida again requests confirmation, though simultaneously performs the correct gesture albeit above the screen. Following Max’s response (line 8), Ida unlocks the iPad and thus completes the project.

In the fourth recording, Ida is seen pressing the physical camera lens three times before shifting her gaze to the opposite side of the iPad and requesting clarification on whether or not she should press there. Upon Max’s confirmation, Ida presses the physical home button and the screen lights up. However, all text on the display is upside down whereby Max rotates the device 180 degrees and the joint project starts anew. Following this, there are two sequences unfolding in a similar way; after pressing the physical home button, Ida does not manage to drag the slider across the screen in time and thus the screen goes black. Ida finally completes the joint project without any preceding clues from Max.

Navigating to the home screen

In our data there are six instances, in three separate recordings, of the participants engaging the local project of navigating to the home screen. The first two recordings are of Max and Ida, and the fifth recording is of Ida and Unni.

As seen in Table 2, the time needed to complete the project progressively decreases both within and between the different recordings. The same pattern is seen regarding the number of turns needed in completing the project, with fewer turns both within and across the recordings. In the excerpts below, which are five weeks apart, it is clear that Ida has learned how to complete the local project without first receiving additional verbal or gestural prompts.

The two first recordings of the participants navigating to the home screen unfold in a similar fashion to the project of unlocking the iPad. That is, the projects are initiated by Max who provides step-by-step directives for Ida to follow. Max’s directives are continuously accompanied by either verbal prompts such as "press" and "house" or deictic gestures, often in combination. In the first instance of the first recording (Excerpt 3) Ida does not appear to grasp that the home symbol is not a representation of their house and thus points outwards into the room (line 5). This misperception is not seen in the second recording.

In the fifth and final recording, which occurs four weeks after the second recording, Unni is seen initiating the project (Excerpt 4, line 1). Unlike Max, Unni initiates the project with an open-ended question rather than an explicit directive. Ida subsequently moves her hand to the correct position and presses the home symbol without any preceding verbal or deictic prompt.

Navigating to a preceding screen

There are twenty instances, across four recordings, where the participants partake in the local joint project of navigating to a preceding screen. In the excerpts below, Ida is seen navigating to the home screen.

Table 2. Quantitative measures – navigating to the home screen.

<table>
<thead>
<tr>
<th>Instance</th>
<th>Number of turns (M/I)</th>
<th>Max, Words (%)</th>
<th>Ida, Words (%)</th>
<th>Max, Words/turn</th>
<th>Ida, Words/turn</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>First week</td>
<td>#1 19 (9/10)</td>
<td>49 (80.3)</td>
<td>12 (19.7)</td>
<td>5.44</td>
<td>1.2</td>
<td>24s</td>
</tr>
<tr>
<td>#2 4 (2/2)</td>
<td>16 (88.9)</td>
<td>2 (11.1)</td>
<td>8</td>
<td>1</td>
<td>7s</td>
<td></td>
</tr>
<tr>
<td>#3 6 (3/3)</td>
<td>13 (86.7)</td>
<td>2 (13.3)</td>
<td>6.5</td>
<td>1</td>
<td>6s</td>
<td></td>
</tr>
<tr>
<td>Second week</td>
<td>#1 14 (7/7)</td>
<td>34 (75.6)</td>
<td>11 (24.4)</td>
<td>4.86</td>
<td>1.57</td>
<td>18s</td>
</tr>
<tr>
<td>#2 3 (3/3)</td>
<td>22 (84.6)</td>
<td>4 (15.4)</td>
<td>7.33</td>
<td>1</td>
<td>9s</td>
<td></td>
</tr>
<tr>
<td>Sixth week</td>
<td>#1 6 (3/3)</td>
<td>22 (81.5)</td>
<td>6 (18.5)</td>
<td>7.33</td>
<td>2</td>
<td>10s</td>
</tr>
</tbody>
</table>

Max’s reported numbers are produced by Unni.

Excerpt 3. Navigating to the home screen, First week, Instance 1

01 M: (points to the bottom of the screen) then you see that there is a
02 (1.0) a house there (points to the bottom of the screen)
03 I: yes
04 M: if you press on it?
05 I: (points out to the room) that one?
06 M: (looks in the direction of Ida's pointing) (0.6) no (points
to the bottom of the screen)
09 I: [no]
10 M: on the house that’s there (0.5) do you see the house there
11 I: (leans forward and points to the screen)
12 M: don’t you have any glasses you don’t [see anything
13 I: (yes (grabs glasses))
14 I: I have them [here (puts on her glasses)]
15 M: (put them on (points to the bottom of the screen))
16 M: do you see the symbol there [with a house
17 I: [yes]
18 I: [yes:
19 M: [pre- press on it
20 I: yes (presses the symbol and the home screen appears)
21 M: there
22 I: (0.7)
23 I: m

Excerpt 3. Navigating to the home screen, first week, instance 1.
From the quantitative summary (Table 3) it can be noted that the mean number of turns needed to complete the project decreased between the different recordings. In addition, the mean time spent to accomplish the project decreased continuously for Max and Ida (Recording 1–3). As the following excerpts show, Ida is seen to take more responsibility in the unfolding local project at hand by performing the appropriate action without her interlocutor organizing the project through step-by-step instructions.

Similar to what has been noted in the projects above, all but one instance (#5) during the first recording progress through explicit directives from Max accompanied by either verbal prompts such as “press” and “arrow” or deictic gestures (Excerpt 5, lines 1 and 3). In three separate instances, at a total number of four turns, Ida is seen responding to Max’s directives by requesting clarification prior to performing the suitable action.

During the second recording there are fewer instances of Max using verbal or deictic prompts in his directives. Unlike the week before, where prompts were present in five out of six project-completions, Max is only seen using prompts in the two initial instances of the recording. There are also fewer instances of Ida requesting clarification. Across the six instances, Ida is seen requesting clarification twice, compared to four times the week before. The first instance of the third recording is the only instance where Max’s directive is supported by any additional prompting. That is, in the following six instances of the recording,
Ida completes the project without any preceding verbal or deictic clue from Max. In addition, there is only one instance of Ida requesting clarification, and during this turn Ida completes the project prior to receiving a response from Max. In the fifth recording, the project is again initiated by Unni through an open-ended question (Excerpt 6, line 1). While Ida’s turn (line 2–5) is rather lengthy she is seen moving her hand to the correct position and subsequently pressing the correct symbol without first requesting clarification or receiving any preceding verbal or deictic prompt from her interlocutor.

Closing the application

To close an application, one needs to press the physical home button of the iPad. We have captured this project in three recordings. In two recordings, week one and week four, the participants turned off the camera before closing the application. As seen in the quantitative findings (Table 4), the participants gradually need less time to complete the project of closing the application. Unlike the other projects, the number of turns needed to complete the project was rather low already from the start. The excerpts bellow accentuate the gradual change in interactional organization with more truncated directives from the interlocutor and more instantly executed actions from Ida.

Excerpt 6. Navigating to a preceding screen, Sixth week

<table>
<thead>
<tr>
<th>Line</th>
<th>Max</th>
<th>Ida</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>U:</td>
<td>how do you leave here (if you want to move on how do you do that)</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>I:</td>
<td>what did you say (clears her throat)</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>(1.2)</td>
<td>(moves her hand towards the bottom of the screen)</td>
<td>yes</td>
</tr>
<tr>
<td>04</td>
<td>(2.5)</td>
<td>it is a thing like that</td>
<td>(presses the arrow)</td>
</tr>
<tr>
<td>05</td>
<td>U:</td>
<td>(nodes)</td>
<td>&quot;m&quot;</td>
</tr>
</tbody>
</table>

Excerpt 6. Navigating to a preceding screen, sixth week.

In the first recording (Excerpt 7), the project is initiated by Max through the directive "then you turn it off" (line 1). Notably, Max does not use any additional verbal or deictic prompting during his initial turn. Though, after Ida responds with what could be described as a searching gesture (line 2), Max initiates a repair sequence and elaborates his directive by both pointing and saying "on the button over there" (line 3).

In the second recording, Max again initiates the project without providing any adherent verbal or deictic promptings (Excerpt 8, line 1). Unlike the week before, Ida responds by immediately pointing to the physical home button and requests clarification (line 2).

While the project is again initiated by Ida’s interlocutor during the final recording, Ida now completes the project herself without either requesting clarification or receiving any verbal or deictic clues (Excerpt 9).

Discussion

Over the course of six weeks, several quantitative and qualitative patterns of change in the interactional organization were identified in the four reoccurring joint projects. A first quantitative pattern had to do with the fact that the time needed for the participants in the present study to complete the joint projects, at large, decreased from week to week; this finding is similar to the

Table 4. Quantitative measures — closing the application.

<table>
<thead>
<tr>
<th>Number of turns (M/I)</th>
<th>Max, Words (%)</th>
<th>Ida, Words (%)</th>
<th>Max, Words/turn</th>
<th>Ida, Words/turn</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second week</td>
<td>5 (3/2)</td>
<td>17 (84.6)</td>
<td>2 (15.4)</td>
<td>3.67</td>
<td>1</td>
</tr>
<tr>
<td>Third week</td>
<td>5 (3/2)</td>
<td>9 (75)</td>
<td>3 (25)</td>
<td>3.15</td>
<td>1.5</td>
</tr>
<tr>
<td>Sixth week</td>
<td>2 (1/1)</td>
<td>4 (36.4)</td>
<td>7 (63.6)</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

Max’s reported numbers are produced by Unni.

Excerpt 7. Closing the application, Second week

<table>
<thead>
<tr>
<th>Line</th>
<th>Max</th>
<th>Ida</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>M:</td>
<td>then you turn it off</td>
</tr>
<tr>
<td>02</td>
<td>I:</td>
<td>(moves her hand back and forth across the screen)</td>
</tr>
<tr>
<td>03</td>
<td>M:</td>
<td>(points towards the physical home button) on the button over</td>
</tr>
<tr>
<td>04</td>
<td>I:</td>
<td>there you know</td>
</tr>
<tr>
<td>05</td>
<td>I:</td>
<td>(presses the button and the application closes)</td>
</tr>
<tr>
<td>06</td>
<td>M:</td>
<td>there</td>
</tr>
</tbody>
</table>

Excerpt 7. Closing the application, second week.

Excerpt 8. Closing the application, Third week

<table>
<thead>
<tr>
<th>Line</th>
<th>Max</th>
<th>Ida</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>M:</td>
<td>and then you can turn it off</td>
</tr>
<tr>
<td>02</td>
<td>I:</td>
<td>(moves to the physical home button) there?</td>
</tr>
<tr>
<td>03</td>
<td>M:</td>
<td>m</td>
</tr>
<tr>
<td>04</td>
<td>I:</td>
<td>(presses the button and the application closes) there</td>
</tr>
<tr>
<td>05</td>
<td>M:</td>
<td>there</td>
</tr>
</tbody>
</table>

Excerpt 8. Closing the application, third week.
results reported by Clark et al. [28,38,39]. A second quantitative pattern was that the participants progressively used fewer turns to complete the local project at hand. However, these quantitative findings were not as salient in the local project of unlocking the iPad. Possible reasons for this are discussed below.

Further, three distinct, and arguably related, quantitative changes were observed at the level of contributions to the joint projects. Firstly, it became clear that Max’s directives gradually contained less explicit verbal and/or gestural clues. Secondly, over time Ida produced fewer requests for clarification following her interlocutor’s directives. Thirdly, Ida’s embodied actions towards the iPad were carried out in an increasingly more accurate and direct fashion as her searching gestures, and the gestural clues from Max, decreased.

In terms of qualitative patterns, it was obvious that the organization of the participants’ contributions to the unfolding joint projects changed over time. In our data we have identified that the joint projects continuously unfolded through a sequence consisting of the same type of contributions (Figure 1). The sequence typically starts with the cognitively healthy interlocutor initiating a joint project by producing a (i) directive. In the following turn, Ida responds with an (ii) embodied action (e.g., pressing, or pointing towards, the screen), at times accompanied with a (iii) request for clarification, implying that she relies more on the feedback from the iPad, i.e., whether or not her action results in the desired outcome (unlocks, returns to the preceding screen etc.).

We argue that the fact that the joint projects, over time, are completed quicker, with fewer turns, and through more implicit directives, shows that Ida requires less scaffolding from her interlocutor. Ida’s reduced need of explicit, and deictic, directives is evident in the lack of extended negotiations following an initial directive. As such, the distance between the “expert” and the “novice” has decreased, with Ida having learned how to manage the basic functions of the iPad and the application, and thus takes more responsibility in completing the joint project [21,24].

The main focus of studies using the intervention techniques of errorless learning, vanishing cues and spaced retrieval has been retention of declarative memories [11]. Our findings instead suggest that the changes evident in the participants’ interactional organization are due to Ida demonstrating procedural learning. The fact that Ida’s learning is predominantly procedural could explain why the quantitative measures of the fourth instance of unlocking the iPad did not follow the general pattern. Following Max’s initial directive, Ida is seen repeatedly pressing on the right-hand side of the device, where the physical home button is usually located. However, when there is no feedback from the iPad, Max identifies that the device was placed incorrectly. After rotating the device 180 degrees, Ida is able to continue with the joint project. This instance further emphasizes how the iPad functions as “a third participant” providing important feedback to both Ida and Max.

Excerpt 9. Closing the application, Sixth week

01 U: (Omri and Ida rise from their chairs): we turn off now
02 I: yes (sits down in her chair) you close it on that one (presses the physical home button)

Excerpt 9. Closing the application, sixth week.

Figure 1. Sequential chain of contributions.

Excerpt 10. The application is closed, Sixth week.

As mentioned above, every instance of the joint projects are initiated by the cognitively healthy interlocutor through a directive. Over time, Max’s directives gradually change from being explicitly deictic and accompanied by both verbal, and gestural, clues (Excerpt 3, line 1–4), to being produced without any additional deictic clues (Excerpt 8, line 1). Progressively, Ida’s responses become quicker and she produces fewer requests for clarification, implying that she relies more on the feedback from the iPad, i.e., whether or not her action results in the desired outcome (unlocks, returns to the preceding screen etc.).

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Implications

This study carries three important implications for practitioners and future research. A first implication is that we have demonstrated that novel learning is possible for people living with dementia when acting in concert with others in everyday activities, even without the use of focussed interventions.

A second implication regards the fact that the novel learning was primarily procedural in nature. In our data, it seems to be the case that Ida recalled what was done rather than what was said when doing. Thus, in activities involving people living with dementia one should not underestimate the importance of doing over verbally explaining what is to be done.

Building on the two prior implications, a third implication is that practitioners do not need to worry about exposing people living with dementia to unfamiliar activities. Contrary to the theoretical underpinnings of errorless learning [12], the present study showed no instances of incorrect learning despite inadequate conduct. When Ida’s conduct is inadequate, the iPad does not respond and she either tries again or receives additional clues from her interlocutor.

To conclude, our proposed theoretical framework does seem feasible when studying learning as changing participation in everyday activities for people living with dementia. Future research should include a larger number of participants and also people living with dementia in residential care facilities.

Disclosure statement

The authors declare that there is no conflict of interest.

ORCID

Elias Ingebrand @ https://orcid.org/0000-0002-5449-8524

References

ARTICLE
People with dementia positioning themselves as learners
Elias Ingebrand, Christina Samuelsson, and Lars-Christer Hydén
Division of Ageing and Social Change, Linköping University, Linköping, Sweden; Center for Dementia Research (CEDER), Linköping University, Linköping, Sweden; Division of Speech Language Pathology, Audiology and Otorhinolaryngology, Linköping University, Linköping, Sweden

ABSTRACT
Recent studies have demonstrated that people living with dementia, contrary to common believe, are capable of novel learning without structured interventions. Opportunities for learning throughout an individual’s lifespan have been acknowledged as important factors in facilitating social participation and promoting wellbeing. However, little is still known about the situated practices used in the learning process for people living with dementia. This study aims to explore how people living with dementia in Swedish residential care facilities position, perceive, and assert, themselves as learners in a novel activity. The study is based on video recordings of eight people living with dementia, who for the first time use tablet computers as a social activity on a one-to-one basis with their formal caregivers. Through interaction analysis, we show how the participants living with dementia use the engagement displays of requests, accounts, formulations and metacomments to make their active undertaking in the ongoing activity public to their communication partner. Our findings suggest that people living with dementia might still perceive themselves as individuals capable of novel learning and that they are active and engaged agents in this process.

Introduction
Life with dementia in residential care facilities is rarely associated with novel learning experiences. As argued by Kydd and Fulford (2020), residential care facilities are typically viewed as settings where older adults go to spend their final days, not to fulfill their potentials. In Sweden, it is estimated that 42% of people diagnosed with some type of dementia, commonly in the moderate or late stages of the disease, live in residential care facilities (Marcusson et al., 2011; National Board of Health and Welfare, 2014). Due to diagnostic connotations and the irrevocable decline of cognitive and linguistic abilities, people living with Alzheimer’s disease, or other forms of progressive major neurocognitive disorders, are commonly portrayed as less than competent members of society and participants in interaction (Hydén & Antelius, 2017; Müller & Schrauf, 2014). As has been pointed out by several scholars, people living with dementia have been described as passive and uninvolved interlocutors, incapable of initiating social action and exerting agency, and unable to uphold focus and engagement in activities (Boyle, 2014; Ekström et al., 2017; Kolanowski et al., 2012; Majlesi & Ekström, 2016). Furthermore, despite numerous studies demonstrating the opposite (e.g., Duff et al., 2013; Ingebrand et al., 2020; De Werd et al., 2013), people living with dementia have been depicted as incapable of novel learning, that is lacking the ability to acquire new knowledge or to learn new skills (Dupuis & Gillies, 2014; Thoft, 2017).

Learning has often been studied in experimental settings and conceptualized as an individual phenomenon where the learner, through intent efforts, attains predetermined information that is to be recalled with as great accuracy as possible at a later stage (Säljö, 2011, 2017). This theoretical notion, combined with experimental study designs, has been the basis for most studies on learning involving...
people living with dementia, resulting in learning of low ecological validity (Ingebrand et al., 2020). Moreover, most studies on learning and dementia to date have had an outspoken focus on how rehabilitative interventions can be implemented in order for people living with dementia to relearn information or abilities that they once knew (Clare, 2008; Kudlicka et al., 2019). Quinn and Blandon (2017) argue that research on learning and dementia has been occupied with containment rather than expansion. Furthermore, they claim that an emphasis on retaining familiar activities rather than enabling novel learning experiences in fact positions people living with dementia outside the realm of learning (Quinn & Blandon, 2017). Studying novel learning for people living with dementia is of importance since such research recognizes people living with dementia as agents capable of development despite living with a progressive condition (Hydén & Antelius, 2017).

In contemporary sociocultural and situated theories of learning, learning is not considered a process restricted to formal settings designed for teaching and learning, nor is it regarded as a strictly individual faculty (Lave, 2019; Melander, 2009). Instead, social and collaborative aspects of learning have been emphasized. As such, thinking, learning and knowing are regarded as processes distributed amongst individuals acting in concert with each other, and any potential artifacts, in an ongoing activity (Lave, 1993). The significance of collaborative and social aspects in facilitating learning for people living with dementia has further been emphasized in studies by Duff et al. (2013), Ingebrand et al. (2020) and Rosenberg and Nygård (2017).

Apart from the interactive dimensions of learning, it has been acknowledged that older adults' perception of their own capabilities to a large extent influences subsequent performance in cognitive or physical undertakings (Lamont et al., 2015; Levy, 2009). According to the stereotype embodiment theory (Levy, 2009), the self-perception of older adults might be influenced by prevailing age-stereotypes (e.g., old people are uninterested in, or incapable of, using new technologies) if these are internalized by the individual (Ivan & Schiau, 2016). However, self-perceptions of age-related capability do not necessarily entail negative performance (Brown et al., 2020). Brown et al. (2020) and Levy (2009) argue that even momentary positive reinforcement, such as sense of success or external praise, might improve an individual's performance.

While people living with dementia indeed face many unquestioned assumptions regarding their capabilities in interaction, it is important to acknowledge that the deterioration of cognitive and linguistic abilities also entails certain communicative difficulties. Changes in memory functions, especially in episodic memory, are one of the most pronounced symptoms for people living with Alzheimer's disease (Marcusson et al., 2011). With a gradual decline of episodic memory functioning, that is the ability to remember autobiographical events and locating them in time and space (Baddeley, 2001), retrospective telling often becomes an immense challenge for people living with dementia (Hydén, 2018).

The fact that people living with dementia are likely to encounter difficulties in retrospective telling does not mean that their views, opinions and lived experiences should be trivialized or overlooked in research (Hellström et al., 2007; Örulv, 2012). However, as suggested by Hubbard et al. (2003), Nygård (2006), and Smith et al. (2018), it might not be sufficient to rely solely on interviews when studying the experiences of people living with dementia. An alternative, or complementary, approach is to use a methodology that enables analysis of how the individual expresses his or her experiences in the ongoing situation, such as interaction analysis (Webb et al., 2020). Returning to the topic of learning and dementia, there are to this date and to our knowledge, few, if any, studies exploring how people living with dementia assert themselves as active and engaged learners in a novel activity (though see the interview and field notes based studies by Rosenberg & Nygård, 2014, 2017).

**Displaying in situ experience and engagement**

Participants in interaction immerse in what Clark (1996) calls joint activities. Joint activities, in turn, consist of embedded joint projects which progress sequentially through turn-taking and the participants' coordinated verbal and embodied contributions to the ongoing activity (Clark, 1996). Each turn, or contribution, to the ongoing discourse is a communicative action (Linell, 1998) designed to do
something, and through their contributions, participants display their current understanding of the ongoing activity (Drew, 2013; Robinson, 2016).

The unfolding verbal and embodied contributions to the ongoing discourse are the means through which participants in interaction can explicate their present sense-making to their interlocutors (Linell, 2011). In the present study, we refer to these contributions as engagement displays. For current purposes, we suggest four types of engagement displays (accounts, requests, formulations and metacomments) that can be used as a way to study how people living with dementia experience and make their current engagement in the activity public to their communication partner. In this sense-making practice, a speaker’s current contribution is other-oriented, in that in the subsequent turn, a co-participant acts upon the preceding turn as a recognizable action (Linell, 2007; Schegloff, 2007). As argued by Melander (2009), “the active work required to engage in shared and collaborative projects is considered a prerequisite for learning” (p. 17). That is, in order for people to learn something they need to position themselves as learners in the ongoing activity, and that is the focus of this study.

One way for a speaker to display her engagement is by providing an account when there is a need to mitigate any potential misunderstanding. By providing an account, the speaker explicates why the action is of relevance to the ongoing activity, thus serving to display her current understanding of the activity (Robinson, 2016). Through this pursuit of understanding, participants continuously make their active engagement in the ongoing activity public (Drew & Penn, 2016). Another way participants in interaction can display their current understanding and orientation toward the joint activity is through requests (Potter, 2012). In producing a request for information, clarification or confirmation, the speaker displays that he or she is presumably less knowing than the addressee (Goodwin, 2018). Participants might also express their current, or changing, understanding of an ongoing activity with formulations (Küttner, 2019), through which the speaker summarizes or paraphrases something specific from the prior turns of the ongoing activity (Deppermann, 2011). Accordingly, by producing a formulation, a speaker foregrounds certain aspects of perceived relevance and consequently makes his or her candidate understanding of the activity thus far public (Deppermann, 2011; Peräkylä, 2019; Solem & Skovholt, 2019). In an even more overt fashion, participants in interaction may display their current understanding or experience by producing metacomments, that is talk about the ongoing activity (Clark, 1996; Linell, 2011).

Aim

From previous research, it has been established that people living with dementia indeed are capable of novel learning (Clare, 2008; Duff et al., 2013; Ingebrand et al., 2020). However, little is still known about how people living with dementia position, perceive, and assert, themselves as learners in an ongoing activity. Therefore, the aim of this study is not to study learning per se but to shed light on how people living with dementia position themselves as learners, and engage in, the unfamiliar activity of using tablet computers, that is, an activity in which novel learning could occur.

Materials and methods

Participants

Between 2018 and 2019, a total number of eight people living with dementia were recruited for participation from three different residential care facilities in two Swedish municipalities. The participants (Table 1), five women and three men, were between 55 and 96 years of age at the time of data collection. Additionally, eight formal caregivers participated in this study. The identification and recruitment of the included participants were aided by the operational managers of each residential care facility.

All of the enrolled residents had long-established and confirmed major neurocognitive disorders due to either Alzheimer’s disease (n = 6), substance use (n = 1) or unspecified dementia (n = 1). However, no formal testing was carried out to assess the cognitive or verbal level of the participants living with dementia prior to their participation in the study. As a means of attaining a symptomatic overview of the enrolled...
residents, the formal caregivers were asked to answer the Cognitive Impairment Questionnaire (Åstrand et al., 2010), an instrument commonly used in Swedish memory clinics. According to the formal caregivers’ proxy-assessments, all participants living with dementia experienced clear difficulties with their episodic memory. None of the enrolled residents reported having any earlier experience of using touchscreen technologies prior to their participation in this study.

All participants and locations in this study are anonymized, ethical approval was obtained from the Regional Board for Ethical Vetting at Linköping University (2017/469-31) and the data collection was permitted by the participants through written informed consents.

Data collection

The empirical basis of the present study consists of a total number of 22 video recordings, with a length ranging from 7 to 26 min, respectively. The average length of the recordings was approximately 16 min and the total length of the data used for this study amounts to just below 6 h. Each recording captures a person living with dementia when he/she is using a tablet computer as a social activity on a one-to-one basis together with a communication partner (i.e. a formal caregiver). All residents were provided with a personal tablet computer that had access to a wide selection of applications (see Figure 1) and were instructed to use one, or several, of them best suited to their interests. The participants were encouraged to use their tablet computers whenever they felt like it during the course of participation (4 weeks). The activities were video recorded through two discrete cameras placed on tripods, one positioned in a front-facing angle of the participants and one positioned more to the side. The first author recorded all but two participants, Joan and Roman, for whom the recordings were carried out by the present formal caregivers instead. During the recording of an activity, the first author was only present in the room while starting and turning off the cameras. The activities were to be recorded on a weekly basis; however, some recordings were canceled when the participant(s) felt unwell on the scheduled day of data collection. All recordings were conducted either in the common spaces of the residential care facilities or in the apartments of the residents.

Data analysis

In order to investigate the experiences that the participants living with dementia have as novel learners in the ongoing activity, this study is informed by practices of conversation analysis and multimodal interaction analysis, as suggested by Webb et al. (2020). Using this analytical stance together with video recordings of the activities allows for repeated viewings of the material and access to the participants’ verbal and embodied conduct as it unfolded there-and-then. Thus, by drawing on video data of the participants’ natural conduct in the ongoing activity, it is possible to explore their in situ experiences as learners in ways that would be difficult to attain through the use of field notes or interviews alone (Mondada, 2013; Smith et al., 2018; Webb et al., 2020). As noted earlier, this might be of extra importance for people living with dementia as they often have a problem with retrospective telling (Hydén, 2018).

Table 1. Participant characteristics.

<table>
<thead>
<tr>
<th>Age</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate</td>
<td>83</td>
</tr>
<tr>
<td>Roman</td>
<td>66</td>
</tr>
<tr>
<td>Iris</td>
<td>79</td>
</tr>
<tr>
<td>Geri</td>
<td>96</td>
</tr>
<tr>
<td>Judi</td>
<td>90</td>
</tr>
<tr>
<td>Joan</td>
<td>55</td>
</tr>
<tr>
<td>Simon</td>
<td>90</td>
</tr>
<tr>
<td>Roger</td>
<td>90</td>
</tr>
</tbody>
</table>
In the 22 video recordings, we identified a total number of 134 sequences where the participants living with dementia asserted themselves as novel learners by making their current understanding and engagement public to their communication partner. After establishing the collection of instances, the selected material was transcribed according to multimodal conversation analytic principles by the first author (Hepburn & Bolden, 2013; see Appendix A for transcription conventions). Following this, the first author repeatedly read the transcripts, scrutinized the video recordings, and made an initial categorization of recurring communicative actions through which the residents made their experience of, and engagement in, the ongoing activity public to their communication partner. The transcriptions, and the suggested categorizations, were subsequently screened by the other authors independently. Any disagreements were discussed until consensus was reached. From the collection of sequences, the four categories of engagement displays discussed above were used: (i) Requests, (ii) Accounts, (iii) Formulations and (iv) Metacomments. As a last step, all excerpts presented in this study were translated from Swedish to English.

Results

In this section, we present results from the main categories along with descriptions of how the participants living with dementia used engagement displays to position and assert themselves as learners in the ongoing activities. While a majority of the 134 identified sequences involved engagement displays adherent to different categories, we elucidate each main category through excerpts that we consider to be typical cases of said category.

Table 2 presents a quantitative overview of the participants’ engagement display turns and their number of turns in total.

Figure 1. Selection of applications.
Requests

Seen across all identified sequences, the most frequently occurring type of engagement display by the participants living with dementia was that of requesting information (see Table 2). The primary characteristic of this engagement display was that the participants sought information from their communication partners as a means to continue with the local project at hand. That is when a participant living with dementia was unable to perform a required action on the tablet computer, whether this action was requested by the formal caregiver or instigated by the participant him/herself, he or she requested further information about how to proceed with the project. In this process, the participant, often implicitly, displayed his/her understanding of the ongoing activity.

In the following, an example of how a participant living with dementia requests additional information from her communication partner is presented (see Excerpt 1). The excerpt is of Joan who is solving a crossword puzzle on the tablet computer together with the formal caregiver Mary. When the excerpt starts, Joan had just typed an incorrect letter in the crossword grid.

As Excerpt 1 shows, Joan initiates the local project of deleting the incorrect letter (line 1) by pointing to the specific letter and thereby drawing the attention of her communication partner to the trouble source. Joan subsequently explicates what information she needs in order to proceed by producing a request (line 2), thus projecting a response of appropriate conduct in the next turn. Accordingly, Mary’s response (line 3–4) furnishes Joan’s request by providing the information needed to proceed with the local project (i.e. Joan needs to locate the backspace key). Through her engagement display, Joan is able to attain sufficient information from her communication partner to complete the local project of deleting the incorrect letter (line 5–6) and continue with the overarching joint activity.

Excerpt 1: Requesting information about conduct.

01 Joan: (points to the letter E in the crossword grid) how do one
02 delete then, ([taps her finger on the letter and selects it])
03 Mary: [yee if you press there and then there is some
04 kinda erase button?
05 Joan: (points to the backspace key) could it be ([presses on the
06 backspace key and deletes the letter])
07 Mary: [right exactly
08 Joan: "m"
09 Mary: then it should end on N then the name there.
Apart from seeking information about how to perform specific actions on the tablet computer, another common phenomenon adherent to this category was that the participants living with dementia requested information regarding the possibilities of the device. The excerpt below serves to illustrate this (see Excerpt 2). Prior to the start of this sequence, Roman and the formal caregiver Mary had been using the maps application to look at the surroundings of Roman’s birthtown Birch Valley (pseudonym).

As can be seen at the very beginning of Excerpt 2 (line 1–2), Mary proposes a future endeavor for herself and Roman. In conversation, the making of arrangements for future joint activities is often occasioned at the end of an ongoing episode of interaction, consequently warranting closure (Ekberg & Lecouteur, 2014; Schegloff & Sacks, 1973). However, rather than orienting to the closure of their joint activity, Roman draws on Mary’s proposal of future endeavor and requests information about the possibilities of the tablet computer (line 4). Subsequently, after receiving confirmation on the possibilities from his communication partner (lines 5 and 7), Roman is seen re-instigating the future joint activity as an immediate joint project (line 8). As their activity progresses, Roman is repeatedly displaying his engagement through requests for confirmation (lines 10–13, 16–17, 20–21, 24–25).
Thus, by seeking information about the possibilities of the device and requesting information about adequate conduct, Roman is making his engagement in the joint activity visible to his communication partner and is consequently able to pursue a local project of clear value to him.

**Accounts**

Another engagement display commonly used by the participants living with dementia, apart from Roger and Joan and with great individual variability (see Table 2), was that of providing accounts. In our data, the production of accounts invariably occurred in close relation to an unexpected response or a non-response from the tablet computer following a participant’s physical conduct on the screen. That is, the participants living with dementia produced accounts to justify or rationalize their own apparent failure in managing the tablet computer.

The first example of this engagement display is presented below (see Excerpt 3). In this sequence Kate, a participant living with dementia and the formal caregiver Julia are using the application CIRCA, a multimedia reminiscence and conversation aid (Alm et al., 2004; Ferm et al., 2020).

After being provided with the available categories (line 1–3), Kate is seen selecting the topic of sports by pressing on the word (line 4). Notably, Kate performs this action without any prior explicit instruction from Julia. However, the application does not respond to Kate’s conduct. In the following turn (line 6), Julia produces a directive, this time accompanied with the verbal prompt “press.” Subsequently, Kate presses the topic two more times, even shifting hands to do so, without any response from the device. In producing the account “it does not want to” (line 9), Kate justifies her own conduct and orients toward the device or application as being accountable for the trouble. Rather than responding to the preceding turn with yet another elaborate directive for Kate, Julia is seen performing the required action and thereby allowing the progression of their joint activity.

In our data, the most common types of accounts were similar to the example presented above. That is, the participant living with dementia held the device accountable for not responding to his/her conduct. However, we also identified cases in which the participant living with dementia acknowledges his/her error and further provides an account of why it occurred, with the nature of the account being either a lack of knowledge or forgetfulness. An example of this is given in the following excerpt where Becca, a formal caregiver, is using the CIRCA application together with Judi (see Excerpt 4).

Before the start of this sequence, Becca and Judi had agreed on watching media related to sports. Similar to what was seen in Excerpt 3, the formal caregiver calls for the participant living with dementia to carry out the local project of pressing the category (line 4–5), again by providing explicit instructions. As Judi fails to do so (line 6), her conduct is repaired by Becca in the following turn. In line 8, Judi acknowledges the error and subsequently accounts for this with “I don’t remember anything” (line 10).

Excerpt 3: Holding the device accountable for non-response.

```
01 Julia: what do you like, everyday li:fe {(points to the category)}
02 or people and events {(points to the category)} or
03 sp[ort? {(points to the category)}
04 Kate: [sport could {(presses on the category, no response from
05 the application)} we take then=]
06 Julia: =yes press on it then,
07 Kate: {(presses on the category, no response from the application)}
08 (1.1) {(changes hand and presses again, no response from
09 the application)} it does not want to.
10 Julia: {(taps on the category and a new screen appears)} [there,
11 Kate: [oh
12 Julia: .mth and thare you can choose photographs videos or music?
```
Holding oneself accountable for non-response.

Much like the engagement display of requesting information, accounting for errors emphasizes the active and engaged role that the participants living with dementia play in activities of novel learning. By acknowledging the occurrence of trouble and making their understanding of their apparent mistake visible to their communication partner, they solicit the help needed to complete the current joint project and progress with the joint activity at large.

Formulations

In our data, we found that it is first and foremost the participants living with dementia who produce formulations of the formal staffs’ prior conduct and thus display their engagement and understanding of what is going on. In the first example of this engagement display, a participant living with dementia, Simon, is looking through photographs on the CIRCA application together with Suni, a formal caregiver (see Excerpt 5).

Excerpt 5: Formulation of prior conduct.

01 Suni: you can browse images.
02 Simon: [(taps on the physical home button, no response from iPad)]
03 Suni: not that button? [(points to an arrow symbol at the right hand side of the image)] you have another one beside there
04 Simon: [(points to the arrow symbol)] there
05 Suni: m:
06 Simon: [(presses on the symbol and drags his finger downwards, resulting in the image scrolling upwards)] oh, [(lifts his finger from the screen and the image returns)]
07 Suni: you can scroll like this [(swipes her finger from right to left across the table)] [then you go towards me
08 Simon: [oh [(swipes his finger across the screen and a new picture appears)] so one needs to
09 drag it away then
10 Suni: [exactly (1.5)] good who is on the picture?
In lines 3–4, Suni initiates a repair sequence of Simon’s conduct in the preceding turn with “not that button” and then draws his attention to the adequate part of the screen by pointing. After requesting and receiving confirmation about where to press (line 5–6), Simon repairs his earlier conduct by pressing on the correct portion of the screen (line 7–9). However, as Simon still does not manage to complete the local project of changing the picture, Suni initiates yet another repair sequence (line 10–11). This time Suni suggests another strategy of scrolling and further provides an embodied prompt of how to do so by swiping her index finger across the table. Simon subsequently displays his understanding of, and engagement in, the local project, in part by performing the conduct in a correct manner, and in part by formulating the gist of Suni’s prior turn with “oh so one needs to drag it away then” (line 12–14). The local project is completed by Suni’s affirmation of Simon’s displayed understanding and the activity progresses with talk about the new photograph (line 15).

Another example of how the participants living with dementia display their engagement and understanding in the ongoing activity through formulations is given in the following excerpt of Iris and Sabah (see Excerpt 6). When this excerpt starts, the participants had been using the notes application and Sabah, the formal caregiver, is initiating the local project of returning to the home screen. In this example, special interest is on the embodied conduct of Iris, the participant living with dementia, in producing the formulation.

In overlap with Iris’s turn (line 4), Sabah (line 5–6) is seen carrying out the local project of returning to the home screen and in the same turn verbally responding to Iris’s request for information with “just press on the green” (the physical home button is marked with a green sticker for reasons of visibility). In lines 7 and 10, Iris displays her understanding of Sabah’s conduct and the practical function of the physical home button through her iconic gesture and verbal formulation of Sabah’s prior turn. As in Excerpt 5, the formulation is affirmed by the formal caregiver (lines 9 and 11).

From the excerpts above it is clear that the participants living with dementia used the engagement display of formulations to claim new understanding of an ongoing joint project. Further, their formulations were treated as qualified in the responses of the formal caregivers, indicating an acknowledgment of competent participation.

Metacomments

In the present study, the production of metacomments, or reflexive speech, was commonly seen amongst all participants living with dementia. Following requests for information, the use of metacomments was the most frequently observed engagement display (see Table 2). Drawing on the work of Ochs and Kremer-Sadlik (2015), our notion of metacomments is a speaker’s contribution to the ongoing discourse in which he/she orients, cognitively or affectively, to the joint activity at large.

Excerpt 6: Formulation with iconic gesture.

```
01 Sabah: should we (. ) go back.
02 Iris: yea
03   (2.1)
04 Iris: do you [get ba-
05 Sabah: [(presses the physical home button and the
06 application closes)] m:: (0.5) just press on the green
07 Iris: sh:: then you go= ((does an arched backward motion with
08 her palm above the screen))
09 Sabah: =yea yea=
10 Iris: =backwards.
11 Sabah: m ((nods her head))
12 Iris: photo album? ((selects a new application from the home screen))
```
Excerpt 7: Orienting towards learning through metacomments.

01 Auth: then I'd like to thank you for this small [occasion.
02 Julia: [yes
03 Kate: {picks up the iPad from the table} it will probably take
04 some time before I can master this
05 Julia: yeah but that is the [point ]we've got tons of time
06 Auth: [we have time
07 Kate: [he he
08 Julia: so [that uhm that is what (.:) it is an exerci- I [know nothing
09 Kate: [yea yea ]yeah
10 Julia: like I don't understand anything?
11 Kate: how much does it cost?

The following example (see Excerpt 7) was captured at the very last minute of the participants’ joint activity as the first author (Auth) returned to the room in order to turn off the cameras. Julia and Kate had not been seen discussing learning earlier in this recording, nor had learning been an outspoken aim in the instructions for participation.

With the metacomment “it will probably take some time before I can master this” (line 3–4), Kate is seen launching learning as a conversational topic as she orients to the presumed temporal trajectory in mastering the tablet computer. Implicitly, Kate is positioning herself as a novice in the ongoing activity which, in the following turn, Julia not only affirms but explicitly legitimizes through “that is the point we’ve got tons of time” (line 5). Moreover, in lines 8 and 10, Julia could be seen possibly mitigating Kate’s initial claim by affiliating with her as also being a novice in the activity. In this sequence, Kate’s metacomment does not seem to be responding to any specific prior interactional moment or turn, but rather to the activity at large. While Kate, through her metacomment, positions herself as a novice she also makes her perceived capabilities to learn, given enough time, public to her communicative partners.

Excerpt 8: Expressing enthusiasm through metacomments.

01 Roman: {points to a street name}) my sister lived there some years ago.
02 Zala: n't "oh"
03 Roman: {scrolls around on the map}) oh my word one could >sit and
04 play with this< for [an eternity {(smiles widely})
05 Zala: *he he he yeah* but it is fun right-
06 Roman: =yes absolutely
07 Zala: [I think it is good {(zooms out on the map) one
08 know- one can find so much things [here.
09 Roman: [yes exactly
10 (0.9)
11 Zala: but uhm should one- [we do like so? {(presses the physical home button})
12 Roman: [on this there are infinite things one
13 could learn [to do
14 Zala: [then we {(presses on app store}) here you search
In some cases, the participants living with dementia also displayed their engagement in the ongoing activity through metacomments of a more evaluative manner, including assessments and affective expressions. An example of this is provided in the following (see Excerpt 8). Here, Roman and Zala, a formal caregiver, are seen using the maps application.

As seen in this excerpt, Roman’s first metacomment (line 4–5) is evaluative in its characteristics. Through this engagement display, Roman clearly expresses his enthusiasm for the device. In line 14 Roman produces yet another metacomment, this time explicitly orienting to learnability. Similar to what was illustrated in Excerpt 7, Roman’s metacomments do not seem to relate to any specific prior turn of the unfolding project, thus far, but rather to the activity at large.

Unlike the other identified engagement displays, the use of metacomments in our data was characterized by a momentary shift in the participants’ communicative labor. In producing a metacomment, the participant living with dementia exercised interactional control for the formal caregiver to follow rather than the other way around which was typically the case.

Discussion
In a previous study, we have shown that people living with dementia are capable of novel learning even without structured interventions (Ingebrand et al., 2020). Drawing on these results, in the present study we aim to explore how people living with dementia in residential care facilities position and assert themselves as active and engaged learners in novel activities. The results from the present study clearly show that the participants living with dementia are actively engaged in the learning process, and that they use a wide range of engagement displays to make their active undertaking in the activity of managing a tablet computer public to their communication partner. Our findings suggest that the participants living with dementia: (i) actively solicited information and assistance needed to progress within the activities, (ii) verbalized newfound understandings of how to manage the tablet computers, and (iii) asserted interactional agency and expressed their capabilities as learners in the activities.

Soliciting information and assistance
In situations when the ongoing activity came to a halt due to a required action outside the limits of the participants’ expertise, they commonly requested information from the formal caregiver on how to proceed. By doing this, the participants living with dementia expressed a desire of wanting to know how to advance in the activity, they further displayed competence in knowing where to find this information and were ultimately able to perform the required action. Also, in requesting information about the possibilities of the device, the participants living with dementia displayed their interest in the ongoing activity and further exerted interactional agency (Isaac & Hamilton, 2019) in influencing the ensuing interaction to meet this interest. While requesting information from a communication partner might typically be seen as a display of incompetence, we argue the opposite. Indeed, by producing requests the participants living with dementia demonstrated interactional competence in securing the information they perceived to be necessary in order to continue with the ongoing activity.

Our results further stressed how the participants living with dementia perceived and positioned themselves as accountable members in the ongoing activities by taking responsibility for their actions in the light of an apparent mistake. By producing an account, thus justifying or rationalizing one’s prior conduct, the participant living with dementia displayed an awareness of not meeting the expected outcome of the local joint project. Whether the participants living with dementia held themselves or the device responsible for not managing to complete a local project at hand, their engagement display allowed them to solicit the assistance needed to proceed from their communication partner.
Verbalizing newfound understandings
Apart from engaging in soliciting information from their communication partners, we discovered how the participants living with dementia themselves verbalized conduct of perceived importance. Through formulations of both their own and the formal caregivers’ conduct, the participants living with dementia thus explicated their understanding of their current undertaking. The fact that the formal caregivers treated the participants’ contributions as competent was evident in their subsequent affirmations. In our data, we found no instances in where a formulation produced by a participant living with dementia was challenged or contradicted by the formal caregiver.

Expressing capabilities to learn
The participants living with dementia perceived themselves as learners in the novel activity was perhaps most evident in their use of metacomments. By introducing learning as a conversational topic, noticeably detached from any specific prior interactional moment, the participants living with dementia clearly exercised interactional agency and further positioned themselves as novices in the activity. While the participants living with dementia positioned themselves as novices in the activity, they also expressed a capability to excel given enough time and practice.

Conclusions
As is clearly observable in Table 2, the participants in our study varied somewhat in what type of engagement displays they most frequently used, as well as in their total proportion of engagement display turns. While the individual discrepancy amongst the participants is prominent, we argue that an even more central finding from our data is that all of the enrolled residents indeed were engaged and active in their participation. Seen across all identified sequences, we found no instance in which trouble occurred and the participant living with dementia withdrew from action or sat a passive bystander in favor of the formal caregiver.

In conclusion, we suggest that learning is not something passively obtained for people living with dementia but instead actively acquired through their continuous engagement in, and publicly displayed sense-making of, ongoing joint activities.

Implications
From this study, three important implications for practitioners and future research can be drawn. A first implication regards the introduction of touchscreen technologies in residential care facilities. The present study finds no indications of technophobia in the participants living with dementia. Accordingly, there is no reason for practitioners to assume troubles in introducing modern technologies as a social activity.

Another implication is to raise awareness amongst practitioners about the fact that requests for information or assistance from people living with dementia does not mean that they find the ongoing activity too difficult or unenjoyable. On the contrary, this might be a sign of engagement and a wish to learn more.

A third, and final, implication is of methodological importance. Through the use of interaction analysis and video recordings of naturally occurring interactions, we have demonstrated that it is possible to attain the experiences of people living with dementia without using retrospective interviews.
Limitations

A limitation of the present study is that the data were collected during a period of only 4 weeks. Consequently, we do not know how, if at all, the engagement displays produced by the participants living with dementia develop over an extended period of time. Accordingly, future studies would benefit from following the enrolled participants over a period of months or by doing follow-up assessments. Another possible limitation has to do with the selection of participants. It could be the case that the individuals living with dementia who agreed to take part in the present study are individuals who already perceive themselves as capable learners. While it is challenging to avoid any potential selection biases, future studies should include a larger number of participants to minimize this risk.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Elias Ingebrand @ http://orcid.org/0000-0002-5449-8524
Christina Samuelsson @ http://orcid.org/0000-0003-0358-3048
Lars-Christer Hydén @ http://orcid.org/0000-0002-3033-9879

References


Appendix A.

<table>
<thead>
<tr>
<th>Transcription conventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Square brackets mark overlapping speech or embodied conduct</td>
</tr>
<tr>
<td>= Equal signs indicate no break or gap between the lines</td>
</tr>
<tr>
<td>() Double parentheses mark visible conduct</td>
</tr>
<tr>
<td>(0.5) Numbers in parentheses indicate silence in seconds</td>
</tr>
<tr>
<td>“word” Underlining indicates emphasis</td>
</tr>
<tr>
<td>- A hyphen indicates cut-off</td>
</tr>
<tr>
<td>: Colon indicates prolongation of the prior sound</td>
</tr>
<tr>
<td>.? The punctuation marks indicate intonation. The period indicates falling intonation, the comma indicates continuing intonation and the question mark indicates rising intonation</td>
</tr>
<tr>
<td><em>word</em> Asterisks surround laughter</td>
</tr>
</tbody>
</table>
Supporting people living with dementia in novel joint activities: Managing tablet computers

Elias Ingebrand a, b, c, *, Christina Samuelsson b, c, Lars-Christy Hydén b, c

a Division of Ageing and Social Change, Department of Culture and Society, Linköping University, Linköping, Sweden
b Department of Clinical Science, Innovation and Technology, Karolinska Institutet, Stockholm, Sweden
b Center for Dementia Research (CEDER), Linköping University, Linköping, Sweden

ABSTRACT

A burgeoning number of studies have demonstrated that people living with dementia are capable of participating in a wide range of everyday activities when supported by care professionals or family carers. However, little remains known about the situated practices used by carers to support people living with dementia as active co-participants in novel joint activities. Taking the use of tablet computers as an example, this study focuses on the interactional organization of instructions in joint activities involving people living with dementia, who have no previous experiences of touchscreen technologies, and their carers. The study is based on forty-one video recordings of ten dyads, each comprising a person living with dementia and a carer, as they are using tablet computers with applications suited to individual interests. Drawing on multimodal interaction analysis, we show how the carers continually foster the accomplishment of their interlocutors, and rarely take over responsibility for closing an ongoing joint project themselves. Our findings suggest that the carers’ instructions, realized as verbal and embodied directives, function as a form of scaffolding practice that facilitates the coordination of visual perception and embodied conduct for the participants living with dementia.

Introduction

In many Western countries, the implementation of digital welfare technologies is increasing both within residential and home-based elderly-care services (Koumakis, Chatzaki, Kazantzaki, Maniadi, & Tsiknakis, 2019; National Board of Health and Welfare [Socialstyrelsen], 2021). Welfare technology is an umbrella term that encompasses a broad array of assistive technologies designed to ‘maintain and/or increase the feeling of safety, activity, participation and independence for a person of any age who has or is at an increased risk of having/developing a disability’ (Frennert & Baslin, 2021, p. 1220). As reported by several scholars (e.g., Buxton et al., 2021; Cavettet et al., 2018; Zander, Gustafsson, Lamberdahl Stridsberg, & Borg, 2021), both care professionals and family carers are faced with the challenge of introducing the novel technology to the intended user, typically an older adult living with cognitive and communicative impairments and little or no prior experiences of the technology being implemented. Due to the rapid pace of digitalization and technological development, the challenge of introducing assistive technologies to care receivers will likely persist in the future. Indeed, Frennert (2021) argues that the implementation of welfare technologies within elderly care services is to be considered a moving target, making it difficult to predict the future needs of care receivers and carers, as well as what technological solutions best used to meet these needs.

During the past few years, research on how people living with dementia may benefit from using tablet computers in interaction with others has gained increased attention (see for example, Evans, Bray, & Evans, 2017; Fern et al., 2021; Swan et al., 2018). As an assistive technology, tablet computers have been suggested to foster social interaction and to promote communication between people living with dementia and their carers (Samuelsson & Ekström, 2019; Smith, Mountain, & Hawkins, 2020). Decrease behavioral and psychological symptoms of dementia (Vahia et al., 2017), and to improve the overall quality of life (Derbring et al., 2021). Furthermore, in previous studies, we have shown that people living with dementia, contrary to common beliefs and despite having no previous experience of using touchscreen technologies, are capable of learning basic instrumental skills needed to use tablet computers as a joint activity with others (Ingebrand, Samuelsson, & Hydén, 2020, 2022), position themselves as learners, and are actively engaged in the learning process (Ingebrand, Samuelsson, &
When revisiting our previous work on how people living with dementia learn to manage tablet computers (Iregbrand et al., 2021; Ingebrand et al., 2020), we find that instructions, typically in the form of directives, addressed by the carers are a central element of the support and learning process. However, little is still known about the interactional organization of instructions in joint activities involving people living with dementia. Thus, of special interest for this study is how care providers support the person with dementia, the carer, and their support novice tablet computer users living with dementia in proceeding within the ongoing joint activities. In this article, we argue that the way in which directives are constructed is of vital importance when introducing novel technology for people living with dementia and for enabling them to participate in the joint activities.

Dementia and tablet computers

Dementia entails certain common difficulties in managing communication in face-to-face interactions and participation in everyday activities (Hyden & Anellius, 2017). Dementia is an umbrella term encompassing a broad spectrum of disorders and impairments causing cognitive, communicative, and behavioral symptoms (Müller & Schraud, 2014). It is important to stress the heterogeneity of the affected population, as the symptomatic characteristics of people living with dementia vary both within and across different dementia diagnoses (Mandell & Green, 2011).

While acknowledging the abovementioned heterogeneity, some frequently reported symptoms that make conversations involving people living with dementia challenging include declining memory functions— as a cardinal symptom of Alzheimer’s, the most common form of dementia (Schelten’s et al., 2016). In the initial stages, people living with dementia primarily tend to experience difficulties relating to episodic memory impairments, that is, the ability to remember autobiographical events and placing them in time and space, making retrospective telling a challenging endeavor (Hyden, 2018). Over time, the progressive nature of the disease will affect other memory functions, such as working memory (Hodges, 2006). Thus, people living with dementia in the moderate and late stages typically encounter difficulties not only with recalling personal memories, but also in retaining activities pertaining to the here-and-now in mind; that is, remembering what they have just done, are currently doing, and going to do in the near future (Hyden & Forshblad, 2018; Morris & Becker, 2004). As reported in numerous studies, other cognitive-communicative challenges experienced by people living with dementia include word-finding difficulties (Ekstrom, Lindholm, Majlesi, & Samuelson, 2017), minimal, delayed, or absent responses to a preceding turn at talk (Jones et al., 2016; Perkins, Whitworth, & Leser, 1998), and trouble with following ongoing conversations and managing topical shifts in interaction (Dijkstra, Bourgeois, Allen, & Burgio, 2004). It is also common for people diagnosed with Alzheimer’s to experience challenges in everyday activities due to visuospatial and visuospatial changes (Jones & Van der Erden, 2008). According to Marquié et al. (2019), neuropathological lesions due to Alzheimer’s disease have been observed all throughout the visual system as the disease progressively spreads globally. Some frequently reported visual symptoms include reduced motion perception, diminished sensitivity of color contrasts, narrowed field of vision, troubles with target fixation, reduced visual acuity, and a reduced ability to integrate multiple visual elements into global images (Jones & Van der Erden, 2008; Marquié et al., 2019).

As a consequence, the combination of visual and cognitive-communicative deficits might entail great difficulties for the individual to perceive and act in his or her proximate environment (Jones & Van der Erden, 2008; Sabat, 2018). Using tablet computers is an activity that strongly depends on the coordination of visual perception and haptic conduct. This means that people living with dementia are specifically faced with challenges of coordinating embodied actions towards the device (e.g., tapping, pressing, or swiping) with their visual perception of the screen (e.g., discerning available information), while at the same attending to the verbal and embodied actions of their interlocutors.

Joint activities involving people living with dementia

Whether taking part in mundane conversations or using touchscreen technologies together with others, it is important to notice that joint interactions, however trivial or complex, are fundamentally collaborative in nature and incrementally achieved by the verbal and embodied contributions of the involved interlocutors (Sidnell & Stivers, 2013). Using Clark (1996) terminology, people doing things together engage in joint activities. Typically, joint activities involve pursuing at least partially shared goals or purposes and therefore require the interlocutors to coordinate their individual actions in order to reach the goal (Clark, 2006). Furthermore, joint activities comprise several smaller nested joint projects, all containing separate sub-goals, which the involved participants jointly need to complete or progress through in pursuing the overarching goal of the activity (Bangerter & Clark, 2003; Knutson, Ros, & Le Bigot, 2018). Again, taking the use of tablet computers as a case in point, the larger joint activity comprises numerous joint projects such as using specific applications, and even sub-projects where the participants are advancing within the applications by, for example, browsing through images, typing on the keyboard, and selecting what videos to watch from a streaming service. All included joint projects, and the transitions within and across them, entail the collaborate effort and coordinated actions of the involved participants.

The impact of cognitive and communicative impairments raised earlier makes possibilities for effectively upholding the necessitated collaboration and coordination an ever-present challenge in joint activities involving people living with dementia (Hyden, 2011). Indeed, in further emphasizing these challenges, joint activities involving people living with dementia might be regarded as atypical interactions (Wilkinson, 2019; Wilkinson, Rae, & Rasmussen, 2020). A characteristic trait of atypical interaction is an asymmetrical distribution of interactional labor amongst the involved participants (Linell, 2009). The asymmetrical distribution of interactional labor implies a shift of some communicative responsibilities from the individual living with dementia to the carer (Hyden, 2014; Majlesi & Ekström, 2016). Whilst being a direct consequence of the cognitive-communicative symptoms associated with dementia, the re-distribution of interactional labor might also serve as a way of minimizing the occurrence of potential collaborative troubles as the interlocutor will have to make additional contributions to support the participation and performance of the individual living with dementia (Hyden & Forshblad, 2018).

Directives as a resource

According to Lindwalm, Lymer, and Greiffenhagen (2015), studies of instructions in interaction have approached the term in different but interconnected ways. The authors discern between (i) instructions-as-teaching, or pedagogical instructions, which implies “getting learners from a state where they do not know to a state where they do know” (p. 145), (ii) instructions-as-directives, that is instructions through which a participant requests specific actions from another participant, and (iii) textual instructions such as following a written recipe or manual. For the present study, both (i) and (ii) are of clear relevance. However, as is further explicated in the aim, the analysis targets the interactional process involved in supporting people living with dementia as active co-participants in novel joint activities rather than the potential learning outcome of the activities. As such, our main focus is on instructions-as-directives. The use of directives is an essential resource in organizing and carrying out joint activities of everyday life (de León, 2017; Goodwin, 2006). Directives can be defined as “utterances designed to get someone else to do something” (Goodwin & Gektz, 2018, p. 40).
Accordingly, directives can be produced in a multitude of grammatical forms such as imperatives, requests, offers and hints (Ervin-Tripp, 1976). Further, as stressed by Goodwin and Cekaite (2018), directives are not limited to verbal and linguistic structures but also include embodied and spatial aspects such as gaze, gestures, bodily positioning and touch. Following a directive, the recipient’s response may be one of full compliance (i.e., performing the requested action), partial or incipient compliance (i.e., acknowledging the directive and making preparatory moves towards performing the requested action), or non-compliance (i.e., rejection) (Goodwin, 2006; Kent, 2012).

To date, a large portion of studies examining directives have targeted family interactions and how parental entitlement is asserted, and potentially contested, in directive-response sequences (cf. Antaki & Kent, 2015; Cekaite, 2010; Goodwin & Cekaite, 2013; Kent, 2012). In a study focusing on directive-response sequences during family meal-times, Craven and Potter (2010) noted that children’s non-compliant responses recurrently made parents reissue and upgrade their initial directives in ways that limited possibilities for further non-compliance in a following turn. Examples of upgraded directives included replacing a modal formulation (e.g., “could you”) with an imperative, synchronizing the verbal utterance with embodied actions specifying the directive, and in extreme cases even performing the requested action (Craven & Potter, 2010). Unlike what has been observed in parent-child interactions, Majlesi, Ekström, and Hyden (2021) argue that the use of directives in joint activities involving people living with dementia has “less to do with the issue of authority and entitlement, but has a much more fundamental function […] in coordinating collaborative activities” (p. 17). That is, directives may function as a resource in organizing the sequence of individual contributions to the joint activity.

To summarize, carers typically take on additional interactional re-
sponsibilities in joint activities to facilitate the participation of people living with dementia. In this study, our focus is on the interactional organization of joint activities involving people living with dementia, who are novice tablet users, and their carers. Specif-
ically, we will show how the carers’ directives might scaffold the coor-
dination of visual perception and haptic conduct needed to progress with the joint activities.

**Aim**

The aim of this study is to investigate the interactional organization of instructions in joint activities between carers and people living with dementia. The rationale for our aim is that the use of instructions has been identified as a central element in joint activities where learning for people living with dementia has been observed (Ingebrand et al., 2020). Furthermore, it has been established that carers may structure joint activities in ways that facilitate participation for people living with dementia (Hyden, 2014; Hyden & Forsblad, 2018). Thus, rather than focusing on the potential outcome of learning, with this study we intend to further understandings about what care professionals and family carers do to support and enable people living with dementia in man-
aging tablet computers despite having no previous experience of touchscreen technologies.

**Method and materials**

**Participants**

In this study, a total number of ten people living with dementia were recruited for participation (for participant characteristics, see Table 1). At the time of their enrollment, eight participants were living in resi-
dential dementia care units, while two participants were still living at home. Moreover, eight care professionals and two family carers vol-
unteered to take part in the study. The identification of eligible partic-
ipants residing or working in the included dementia care units, which were located in two municipalities in the central part of Sweden, was assisted by the operational managers of each facility. Emma, one of the participants living at home, was recruited after receiving information about the study from her local dementia support group. The other participant living at home, Ida, was recruited by a scholar affiliated with our research group.

Apart from living with a confirmed dementia diagnosis for a mini-
mum duration of one year, to be included for participation in this study, the participants with dementia could not have any reported experiences of using touchscreen technologies. Furthermore, prior to their partici-
pation, a symptomatic overview of the participants living with demen-
tia, with exception for Ida, was obtained through the Cognitive Impairment Questionnaire (Åstrand, Rostad, & Wallin, 2010). The cognitive impairment questionnaire is an informant-based instrument commonly used in Swedish memory clinics which offers an indication of neurocognitive symptoms currently experienced. According to the proxy-assessments, carried out by carers who had daily contacts with the included participants, significant memory difficulties were prevalent in all participants with dementia. No further formal testing (e.g., via the Mini Mental State Examination) was conducted to assess the cognitive abilities of the included participants. The recordings of Ida and her spouse Max were originally collected for a pilot study where neither formal testing nor informant-based questionnaires were used. However, the couple reported experiencing difficulties pertaining to Ida’s episodic memory.

All names of participants, locations and other potentially identifying information in this study have been pseudonymized. Ethical approval was obtained from the Regional Board for Ethical Review at Linköping University (2017/469-33), and the data collection was permitted by all participants through written informed consents.

**Data collection**

The empirical foundation for the current study comprises a total number of 41 video recordings, each capturing a person living with dementia using a tablet computer on a one-to-one basis together with a carer (that is, a care professional or family carer). The recordings varied in length from approximately 7 to 46 min, with an average duration of just above 19 min. In total, the included material amounts to some 13 h. During the full course of their participation, all respondents were equipped with a personal tablet that included a wide range of pre-
installed applications. The pre-installed applications included, to name a few, an application for drawing, streaming services for Swedish radio and television, an application with crossword puzzles, and Circus and Circus (Astell et al., 2018), two multimedia reminiscence and con-
versation aiding applications. Further applications were installed at the request of any participant.

At minimum, the data were to be collected on a weekly basis over a course of four to six weeks; however, some recordings were canceled when the participant(s) declined participation on the scheduled day of data collection. The participants were encouraged to use the devices daily with any applications best suited to their interests, and apart from being asked to have some of their activities video recorded, no further

Table 1  
Participant characteristics.

<table>
<thead>
<tr>
<th>Age</th>
<th>Setting</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate</td>
<td>83</td>
<td>Residential care</td>
</tr>
<tr>
<td>Roman</td>
<td>66</td>
<td>Residential care</td>
</tr>
<tr>
<td>Iris</td>
<td>79</td>
<td>Residential care</td>
</tr>
<tr>
<td>Gert</td>
<td>96</td>
<td>Residential care</td>
</tr>
<tr>
<td>Ivaldi</td>
<td>90</td>
<td>Residential care</td>
</tr>
<tr>
<td>Jean</td>
<td>55</td>
<td>Residential care</td>
</tr>
<tr>
<td>Simon</td>
<td>90</td>
<td>Residential care</td>
</tr>
<tr>
<td>Roger</td>
<td>90</td>
<td>Residential care</td>
</tr>
<tr>
<td>Ida</td>
<td>52</td>
<td>Home care</td>
</tr>
<tr>
<td>Emma</td>
<td>62</td>
<td>Home care</td>
</tr>
</tbody>
</table>
instructions on how they should structure their activities were given. That is, there were no instructions concerning teaching or learning as an objective of their activities. All recordings were conducted either in the living room of the participants or in the common spaces of the dementia care units. The activities were captured through discrete video cameras mounted on tripods. With the exception of Joan and Roman, where the recordings were made by the enrolled care professionals, the first author recorded all participants residing in dementia care units. Throughout the recordings, the first author was only present in the room when starting and turning off the video equipment. For Ida and Emma, who were still living at home, the recordings were carried out by their spouses.

Data analysis

In our analysis of the video data, we follow the principles of conversation analysis and multimodal interaction analysis to show in detail how the dyads structure and progress through their ongoing joint activities on a turn-by-turn basis (Goodwin, 2010; Sidnell & Stivers, 2013).

Following the data-driven approach of conversation analysis, as a first analytical step we repeatedly went through the video recordings and took notice of how the participants initiated or transitioned between joint projects in the overarching joint activities. A recurrent interactional phenomenon, which became the subsequent focus of our analysis, was that project transitions were primarily accomplished through instructions realized as directive-response sequences. When searching for directives in our material, we included verbal contributions that had a syntactical form of a directive (such as imperatives, requests, and hints; Ervin-Tripp, 1976), and co-occurring, or standalone, embodied actions (such as pointing gestures, enactments, bapptic contacts; Goodwin & Egbert, 2018). Characteristically, a sequence was considered to begin with a directive through which a carer initiated a joint project, telling a participant living with dementia how, and sometimes where, to engage with the tablet computer. Conversely, a sequence was considered complete when the requested action was successfully carried out. Further, we defined upgraded directives as revised directives containing verbal or embodied information absent from the initial directive. From the 41 video recordings, a total number of 287 directive-response sequences were identified and selected for further analysis.

The collection of directive-response sequences was subsequently transcribed by the first author following multimodal conversation analytic conventions (Hepburn & Bolden, 2013; Mondada, 2018; See Appendix for conventions). Following this, the first author made an initial categorization of the selected material based on how carers formulated their directives and in what way the participants living with dementia were able to perform what was requested of them. As a last step, the second and third author independently screened the transcriptions, and the proposed categorizations, and any disagreements were collectively discussed until consensus was reached.

Results

From the collection of identified sequences, three categories were established. As implied above, we found that all but one (see Excerpt 5) of the 287 directive-response sequences were initiated by a carer. Furthermore, we found no instances of non-compliant responses from the participants living with dementia following an initial directive. However, what differentiated the included sequences, and thus denoted the categories, was that the initiated joint projects were either accomplished by a participant living with dementia (categories i and ii), or by a carer (category iii). In directive-response sequences completed by a participant living with dementia, they were able to do what was requested of them either (i) without upgraded directives in subsequent turns (n = 144), or (ii) with upgraded directives in subsequent turns (n = 106). Conversely, in directive-response sequences where a participant living with dementia did not manage to complete an initiated joint project despite receiving upgraded directives, (iii) the requested action was ultimately performed by a carer (n = 37).

Table 2 provides a quantitative summary of the included directive-response sequences for each participant living with dementia. First of all, the quantitative findings in Table 2 clearly show that directive-response sequences frequently occur in joint activities between people living with dementia and carers. Moreover, it is evident that carers often upgrade their initial directives to support their interlocutor in doing the requested action. We also note an individual variance ranging from one (Emma) to eight (Roger) directive-response sequences per 10 min, with a mean number of four directive-response sequences per 10 min for all included participants. Further, almost nine out of 10 directive-response sequences were ultimately accomplished by the participant living with dementia, and only 12.9% of all identified sequences had to be finished by the interlocutor.

In half of all directive-response sequences, the participants living with dementia managed to carry out the requested action following an initial directive (50.2%; category i). Five individuals did not need additional support in subsequent turns in half or less than half of all their directive-response sequences. Conversely, in half of all directive-response sequences (49.8%; category ii + iii), the carers upgraded their directives due to an insufficient response following an initial directive. Generally, individuals having a higher proportion of upgraded directive sequences coincided with a higher proportion of sequences being completed by a carer.

In conclusion, although there are no strong patterns, there is an indication that some individuals needed more support than others, and for these individuals it was more probable that the carer finished the sequence.

In the following, results from the three categories are consecutively presented. Further, the main findings are illustrated through excerpts of what we consider to be representative cases of said categories.

Directive-response sequences without upgraded directives

Seen across all identified joint projects organized through directive-response sequences in our material, about half were accomplished in the turn immediately following an initial directive. That is, the directive produced by the carer was formulated in a way sufficient for the participant living with dementia to be able to do what was requested of him/her. However, as is clearly seen in Table 2, there were great individual differences amongst the participants living with dementia regarding how often only one initial directive was needed. Whilst acknowledging individual differences, there were certain characteristics to be found in how initial directives were produced by the carer in directive-response sequences without upgraded directives.

A primary trait of the directives pertaining to this category was that they contained information, or cues, both about what embodied actions the person living with dementia were expected to perform and where on the screen this should be done. Furthermore, the initial directives were in most cases, specifically in 102 out of the 144 identified sequences, multimodally designed and constructed with both verbal and embodied cues.

A first example of a joint project accomplished following an initial directive is presented in Excerpt 1. In the example, Roger and the care professional Laura, are using an application called NYT Play, an on-demand streaming service from the Swedish public television broadcasting company. The participants are sitting next to each other with the tablet computer placed in between them on a table. Just prior to the start of the excerpt, the participants had selected a sports category and as the excerpt begins the screen is showing a list of available videos.

The project of browsing through content in search for a video to watch is initiated by Laura as she produces the directive “then we can see if you can drag the image a bit upwards like we usually do” (line 1–2). By explicitly stating “you”, and further by not doing the scrolling herself, Laura clearly orients towards Roger being the one who should
Table 2
Summary of directive-response sequences.

<table>
<thead>
<tr>
<th>Number of recordings</th>
<th>Total length of recordings in minutes</th>
<th>Number of directive-response sequences (per 10 min)</th>
<th>(i) Sequences without upgraded directive (percent of directive-response sequences)</th>
<th>(ii) Sequences with upgraded directive (percent of directive-response sequences)</th>
<th>(iii) Upgraded sequences completed by a care participant (percent of directive-response sequences)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emma 8</td>
<td>241</td>
<td>32 (1)</td>
<td>23 (63.6)</td>
<td>9 (27.3)</td>
<td>3 (9.1)</td>
</tr>
<tr>
<td>Geri 3</td>
<td>53</td>
<td>13 (2)</td>
<td>3 (25)</td>
<td>8 (66.7)</td>
<td>1 (8.3)</td>
</tr>
<tr>
<td>Kate 5</td>
<td>128</td>
<td>41 (3)</td>
<td>20 (48.8)</td>
<td>9 (22)</td>
<td>12 (29.2)</td>
</tr>
<tr>
<td>Ida 4</td>
<td>76</td>
<td>29 (4)</td>
<td>18 (55.2)</td>
<td>9 (31)</td>
<td>4 (13.8)</td>
</tr>
<tr>
<td>Jodi 3</td>
<td>51</td>
<td>51 (4)</td>
<td>6 (30)</td>
<td>10 (50)</td>
<td>4 (20)</td>
</tr>
<tr>
<td>Jane 2</td>
<td>20</td>
<td>10 (5)</td>
<td>8 (88)</td>
<td>2 (20)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Simon 1</td>
<td>46</td>
<td>46 (5)</td>
<td>6 (24)</td>
<td>14 (35)</td>
<td>5 (20)</td>
</tr>
<tr>
<td>Roman 3</td>
<td>46</td>
<td>28 (6)</td>
<td>24 (85.7)</td>
<td>3 (10.7)</td>
<td>1 (3.6)</td>
</tr>
<tr>
<td>Mia 6</td>
<td>99</td>
<td>90 (9)</td>
<td>33 (30)</td>
<td>32 (38.5)</td>
<td>1 (1.5)</td>
</tr>
<tr>
<td>Roger 3</td>
<td>31</td>
<td>23 (8)</td>
<td>7 (30.4)</td>
<td>10 (45.5)</td>
<td>6 (28.1)</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>782 (4)</td>
<td>144 (52.2)</td>
<td>106 (36.9)</td>
<td>37 (12.9)</td>
</tr>
<tr>
<td>Mean 4.1</td>
<td>78.2</td>
<td>28.7</td>
<td>14.4</td>
<td>16.8</td>
<td>3.7</td>
</tr>
<tr>
<td>Median 5.5</td>
<td>52</td>
<td>26.5</td>
<td>12</td>
<td>9</td>
<td>3.5</td>
</tr>
</tbody>
</table>

01 Laura: <da kan vi se om du kan dra bilde! lite uppt? then we can see if you can drag the image a bit upwards
02 Laura: [som vi brukar göra] like we usually do
03 Roger: [sjus]
Roger: [swipes finger upwards across the screen, page scrolls downwards]
04 Laura: bra! perfekt good perfect perfect
05 Laura: lite till kan du stå om du har läst färbit a bit more you can take if you've finished reading
Roger: [continues scrolling]-->
06 Laura: bra!
Roger: ---
07 Laura: <de dår tror ja va från i helgen? då kanske vi kan titta på that one I think is from this weekend? perhaps we can watch it
Laura: [makes a repeated tapping gesture above a thumbnail]


perform the action needed to progress within the project. Notably, Laura’s directive contains several cues, both verbal and embodied, to what it is that Roger is expected to do in a subsequent turn. Her verbal cues regard what embodied action Roger should carry out on the screen (“drag”), the direction of this motion (“a bit upwards”), and where he should do this (“the image”). Furthermore, the specificities of how to do this is provided through an embodied cue where Laura makes a repeated upwards swiping gesture right above the screen (Fig. 1). Roger responds with a brief “yes” whilst swiping his finger across the screen causing the page to scroll downwards (line 3). That Laura treats Roger’s conduct as adequate is evident in her subsequent turn (line 4), consisting of positively evaluative elements (“good perfect perfect”). In line 5, Laura issues yet another directive; however, this time downgraded since her directive contains neither verbal nor embodied cues concerning the projected course of action. Again, Roger responds appropriately by swiping downwards on the page (in line 5). Subsequently, their ongoing joint project comes to an end as Laura suggests a specific video for them to watch, and thereby initiates another joint project (line 7).

As mentioned previously, most directive-response sequences accomplished without additional upgrades were initiated with a multi-modally formulated directive where verbal cues were reinforced by either pointing gestures or, as seen in Excerpt 1, gestures through which the carer enacts a specific action. In some cases, however, the sequences were accomplished following completely verbal initiatory directives. We found that in most instances these directives were “complete” in terms of verbal cues, containing information both about what embodied action to do, and deictic information directing the attention of the participant living with dementia to a specific part of the screen. Furthermore, as was the case with Laura’s downgraded directive (line 5, Excerpt 1), directives that related to an action already performed in the preceding turns were often formulated without any adherent embodied cues. Additionally, as will be shown in Excerpt 2, when a person living with dementia repeatedly had been able to perform a reoccurring action,
both within and across recordings, the initiatory directives rarely included descriptive cues. In the following excerpt, Idå and her spouse Max are using an application called GoTalk NOW, a customizable augmentative and alternative communication application containing personal photographs and videos sorted under various categories created by the users. Preceding this example, the participants had viewed and discussed photos relating to one of their children for more than three minutes. Thus, the following directive-response sequence does not concern a recently performed action.


01 Max: **ha? ska vi backa tobakå då (så, right shall we go back then and
02 Idå: |mst
03 Idå: (1.0)s
04 Max: se där så?
05 Max: |he vi nå- må, mar som vi ente har pratat om? do we have an- anyone else that we're not talked about


01 Suni: ojej om du blåddrar lite ska vi se om du har nåt mer? okay if you browse a bit we'll see if you have anything else
Suni fig #fig.1
02 Simon: (1.5)
03 Simon: &blåddrar man e-
04 Suni: &points to screen
05 Simon: (1.1)
06 Suni: &swipes from right to left above the screen
07 Simon: &swipes across the screen and a new image appears
08 Suni: &swipes across the screen and a new image appears
09 Simon: &swipes across the screen and a new image appears
10 Suni: &swipes across the screen and a new image appears
11 Simon: &swipes across the screen and a new image appears
12 Simon: *he ha*
13 Simon: *ven har vi här?* who do we have here
14 Simon: ja ja t- vet inte de yes t- don't know that
15 Simon: *he ha*
16 Simon: *ven har vi här?* who do we have here
17 Simon: ja ja t- vet inte de yes t- don't know that
18 Simon: *he ha*
19 Simon: *ven har vi här?* who do we have here
20 Simon: ja ja t- vet inte de yes t- don't know that
21 Simon: *he ha*
22 Simon: *ven har vi här?* who do we have here
23 Simon: ja ja t- vet inte de yes t- don't know that
24 Simon: *he ha*
25 Simon: *ven har vi här?* who do we have here
26 Simon: ja ja t- vet inte de yes t- don't know that
27 Simon: *he ha*
28 Simon: *ven har vi här?* who do we have here
29 Simon: ja ja t- vet inte de yes t- don't know that
30 Simon: *he ha*
(for further details, see Ingebrandt et al., 2020). The sequence is initiated by Max through his proposal “right shall we go back then and” (line 1). Despite being formulated as a proposal, and further containing no cues on how to “go back” or about who should do this, Ida treats Max’s turn as a directive issued towards herself as she responds with both verbal and bodily compliance (lines 2–3). Similar to what was shown in Excerpt 1, the conduct is acknowledged by the carer after which a new joint project is instigated (lines 4–5).

We found that the initiatory directives in directive-response sequences accomplished without additional upgrades were generally formulated in a way that left little room for uncertainties regarding the what, how and where of subsequent actions from the participant living with dementia. However, in instances where the required conduct had just been performed, or when the participant living with dementia exhibited signs of having learned the specific action, accompanying verbal or embodied cues appeared to be redundant.

**Directive-response sequences with upgraded directives**

While we found no instances of non-compliant responses following an initiatory directive, for all participants living with dementia included in the present study, there were occasions wherein their response to an initial directive did not accomplish the requested action. Similar to the findings in parent-child interactions (Craven & Potter, 2010), we noted that insufficient responses entailed the carer participants to reissue and upgrade their initial directives. While the initial directives in our collection of directive-response sequences without additional upgrades were for the most part “complete” in terms of verbal and embodied cues, this was rarely the case for directive-response sequences with upgraded directives. Accordingly, we found that the upgraded directives primarily regarded providing cues that were absent from the initial directive, thus enabling the participating living with dementia to what he/she was unable to do.

Excerpt 3 shows Simon and Suni, a professional carer, as they are using Apple Photos, an application containing various photographs taken by the dyad in between recording sessions. Before the start of the excerpt, the participants accessed the application from the home screen, and it opened in slideshow mode displaying an image capturing the view from Simon’s apartment.

This sequence is initiated by Suni through her turn “if you browse a bit we’ll see if you have anything else” (line 1). While her utterance is reinforced with an embodied cue—two quick swipe-gestures performed some centimeters above the screen (Fig. 1) — it contains no verbal cues specifying the projected course of action. Again, the initiatory turn is clearly treated as a directive by the participating living with dementia. However, unlike the two previous excerpts, Simon does not demonstrate immediate compliance. Instead, following a pause of 1.5 s, Simon responds with “does one browse” while pointing to the right-hand side of the screen (line 3). In cuttin Simon off, Suni appears to treat his turn as a request for clarification and responds with an upgraded directive. Suni upgrades her initial directive by providing two cues that were absent from the start. First, with the verbal cue “with the finger like this” (line 4), Suni both explicates what one should use, namely the finger, and draws attention to how one should use it by stating “like this”. Second, her verbal cue is coupled with an upgraded embodied cue where Suni, instead of swiping-gestures well above the screen, enacts the required action by swiping her finger upwards along the tablettop (Fig. 2). In the subsequent turn, which is heard as a request for confirmation, Simon repeats the enacted gesture above the screen, swiping left rather than upwards, whilst uttering “like so” (line 5). Through “pro towards the window yes” (line 6), Suni not only confirms Simon’s displayed understanding of what to do but further provides yet another verbal cue, “the window”, an upgrade establishing the direction of the projected action.

In line 7, Simon carries out the requested action and thus brings the initial directive to a close. Again, the successful conduct is acknowledged by the carer’s “like so yes” (line 8), upon which they continue with their joint project of looking at photographs from the camera roll (lines 8–11). Notably, in line 9, Simon takes the initiative to change the current image without any preceding directive from the carer. This is in line with our abovementioned findings where recently performed actions need less, or in this case no, guidance from the interlocutor.

As seen in the previous excerpts, and indeed throughout our collection of directive-response sequences, we found that the carers put great effort into involving the participants living with dementia in managing the tablet computers. The following example highlights how a carer, Sabha, orients towards the doing of the participating living with dementia as the focal task at hand rather than simply demonstrating a specific action.

In Excerpt 4, Sabha and Iris are using Sketchbook, an application for making illustrations and drawings. In the turns preceding this excerpt, Sabha had drawn a long squiggly line on the screen and informed Iris that one can remove it using an eraser. However, Sabha had some troubles finding the eraser on screen, trying various available tools. When the excerpt begins, Sabha had just identified the corresponding symbol.

After finding and selecting the eraser symbol, Sabha erases a small portion of the squiggle line and thereby demonstrates how to perform the specific action (line 1). Following a slight chuckle from Iris (line 2), Sabha produces the directive “remove with eh the fingers” and swipes her index finger back and forth above the screen (line 3). While Iris’s overlapping response “ah yea m yes” (line 4) could be heard as acknowledging the directive, there are no signs projecting bodily compliance from her. Instead, Iris first gazes at Sabha then shifts her gaze towards the screen with a puzzled face (line 5). As there is no immediate response from Iris, Sabha subsequently reissues and upgrades her initial directive, this time with both personal and spatial deixis: “you shall remove there” (line 6), specifying that Iris is the one who should do the erasing. While “you”, unmistakably means Iris, what “there” refers to is not explained in this turn. Notably, beyond the additional verbal cue, Sabha also upgrades her embodied conduct by grabbing Iris’s hand and manually guiding it towards the screen rather than repeating the enacted swiping motion. In line 8, Sabha again reissues and upgrades her directive, now clarifying what Iris should erase by coupling the verbal cue “that one” with an embodied cue of a pointing gesture just above the squiggly line (Fig. 1). Following the trajectory of upgraded directives, Iris manages to do what was requested of her and starts erasing the line where Sabha pointed (line 9). After acknowledging Iris’s conduct (line 10), Sabha again demonstrates how the action is done upon which their ongoing joint project comes to a close.

In sum, we found that when an initial directive did not lead to immediate bodily compliance from the participant living with dementia, the carer would reissue and upgrade the initial directive, through a wide array of verbal and embodied means, until the person living with dementia managed to carry out the requested directive (cf. Craven & Potter, 2010; Hyden & Forsblad, 2018). However, as the next section will show, there were instances in our material where the participants living with dementia were unable to fulfill the directive despite receiving multiple upgraded directives.

**Directive-response sequences completed by a carer**

Looking at all 287 identified directive-response sequences in our material, the present category accounted for some 13%. That is, in 87% of the cases, the participant living with dementia managed to accomplish the requested action, either with or without additional support from the carer. However, in our collection of joint projects containing upgraded directives, just above one fourth of the sequences were ultimately completed by a carer participant (see Table 2). Apart from the fact that the carers, in the end, took over the responsibility for performing the relevant action, this category shares the same interactional characteristics as the other upgraded directive-response sequences.

The next, and final, excerpt shows how Emma and her spouse Peter engage in a joint project of turning off the tablet computer. When
Excerpt 5 begins, the participants had just finished looking at results from an orienteering competition on a webpage.

Unlike all other directive-response sequences in our collection, in Excerpt 5 the participant living with dementia is the one who initiates the joint project. Indeed, the sequence begins with Emma producing the directive “then you can turn off” (line 1) whilst returning the home screen of the device. However, following a lengthy pause of 2.5 s (line 2), rather than performing the requested action, Peter instead formulates Emma’s preceding turn and issues the directive back to her. Notably, neither Emma nor Peter verbally explicated what they wanted their interlocutor to turn off. That Emma intended for Peter to turn off the stationary camera, though, becomes evident in her subsequent response where she points directly to the recording device whilst stating “yes that one”. Conversely, Emma clearly treats Peter’s slight nod with the head, co-occurring with “train on turning off” (line 3), as a referring to the tablet computer rather than the video camera.

During the ensuing 5.9 s, Emma picks up the tablet computer, tilts the left-hand side of the device upwards, presses and holds her finger on the power-button until the “slide to power-off screen” appears, upon which she places the device back on the table (line 5). Interestingly enough, considering that Peter’s directive contained no verbal or embodied cues regarding how, or where, to access the power-off screen, Emma evidently had learned how to perform this first necessary step towards turning off the device. The power-off screen contains two discernable objects; a slider field, placed at the top center part of the screen, and a cancel button, placed at the bottom center. After placing the device on the table, Emma moves her hand towards the bottom part of the screen (line 6–7). However, her current motion is interrupted by Peter who points to the on/off symbol (Fig. 1) and issues the upgraded directive “no drag there you hold on.” (line 7). Apart from the embodied cue, pointing right above the symbol in the slider field (Fig. 2), Peter also provides verbal cues regarding what embodied action Emma should do “drag”, where to do it “there”, and further that Emma should “hold on.” Peter’s turn is subsequently cut-off by Emma who acknowledges that she is to “hold on it” (line 8).

While still pointing, Peter then explicates that the symbol is the “turn-off button” (line 9). At the same time, Emma taps on the symbol in the slider field which yields no response from the tablet computer. Consequently, Peter produces another upgraded directive, “and then you drag to the right it says” (line 10), this time both verbally specifying the direction of the projected action, and enacting the motion by swiping his finger, from right to left, just above the screen. Following Peter’s

Emma: så får du stänga av?

then you can turn off

Emma tappar på den fysiska home-button och home screen appears

Peter: tänka på att stänga av

train on turning off

Peter: vända sig mot skärmen

Emma: ja den där

yes that one

Emma: pekar mot den stationära kameran

(5,9) The device picks up the device, presses power-button until a slider for turning off appears, places device on table

Emma: rörer ut den index finger towards the bottom part of the screen-->

Peter: fäst drar där hu skal drags

no drag there you hold on-->

Peter: pekar rätt ovanför on/off-symbolen i den linsen-->

Emma: [måste hålla på den]

get hold on it

fig #fig.1

fig #fig.2

Peter: där är avstängningsknappen

that one is the turn-off button

Peter: -->

Emma: tappar på on/off-symbolen, inga respons

10 Peter: åh det är höger står det

and then you drag to the right it says

Peter: multi-touch-rotation just above the screen

Emma: swipes down from the symbol, no response

fig #fig.3

Emma: swipes from left to right within the slider but does not start from on/off-symbol, no response

12 Peter: dra! i dra för att stänga av-

drag in drag to turn off

Peter: multi-touch-rotation across the slider and turns off device

Emma: ja men den ville ju ente? (0.6) mina fingrar dög ente

yes but it didn't want to my fingers were not good enough

Peter: hh ha ha
swipe-gesture, but coinciding with “to the right”, Emma swipes her finger downwards from the on/off-symbol (line 10, Fig. 3), again without any response from the device. Without any additional directives from Peter, Emma then repairs her conduct and swipes her finger within the slider (line 11), however nothing happens since she does not start from the symbol. Their joint project is finally completed by Peter who, upon reading aloud the text visible in the slider field, swipes his finger across the slider and turns off the device. As a final remark, Emma holds the device accountable for not turning it on, stating “yes but it didn’t want to my fingers were not good enough” (cf. Ingebrand et al., 2021).

Discussion
In the present study, we set out to examine how instructions are interactionally-organized in the joint activity of using tablet computers between caregivers and novice touchscreen users living with dementia. Drawing on our quantitative and qualitative results, there are a number of findings we believe are especially important to discuss. In the following, we will discuss (i) what caregivers do to support and enable participation from people living with dementia, (ii) how the caregivers pursue the completion of the ongoing joint projects from the participants living with dementia, and (iii) how joint projects unfold from a first initiative to a close.

Enabling participation: Scaffolding
What, then, is it that the caregivers do to support and enable the participants living with dementia in accomplishing ongoing joint projects? We argue that the directives produced by the caregivers, whether being initial or upgraded directives, function as a form of scaffolding. The term scaffolding was first introduced in a study by Wood, Bruner, and Ross (1976) where it was described as a “process that enables a child or novice to perform a problem which he would not be able to perform without external assistance” (p. 90). In their study, the authors showed how children, aged 3 to 5 years, managed to construct complex three-dimensional puzzles from wooden blocks when given adequate support from adult tutors. The observed scaffolding practices deployed by the “expert” participants included, to name a few, directing the attention of the novice to the task at hand, parsing the task into smaller recognizable steps, and demonstrating possible next steps for the learner to imitate (Wood et al., 1976).

During the past few years, several scholars (cf. Gjerens & Måseide, 2015, 2020; Hylen, 2011, 2014) have also applied the notion of scaffolding to dementia studies, elucidating the various interactional practices through which caregivers support the participation of people living with dementia in joint activities. As an example, Gjerens and Måseide (2020) describe an episode where a person living with dementia was peeling and chopping potatoes together with a care professional and a researcher. Even though the carer repeatedly pointed to a bowl whilst explaining that the potatoes should go in it, the resident displayed trouble understanding what to do next. However, after the researcher tilted the partly filled bowl towards the resident, making its content visible, the person with dementia was able to perform the expected next action. The authors describe the tilting of the bowl as “an analogous and corporeal form of scaffolding that was more concrete than talking and pointing” (p. 1779).

As mentioned in the background, people living with dementia commonly experience both cognitive-communicative and visuo-spatial impairments (Jones & Van der Eerden, 2008). Bearing this in mind, we argue that the verbal and embodied directives in our material may in fact scaffold the coordination of visual perception and embodied conduct for the participants living with dementia. With the exception of directives regarding joint projects that were either recently completed (e.g., line 5 in Excerpt 1), or already learned by the participant living with dementia (e.g., Excerpt 2); we find the bulk of directive-response sequences to center around establishing the fine-grained details of the what, how and where of the requested actions. In line with Gjerens and Måseide (2020), it appears that for directives to be successful, in the sense of enabling the participant living with dementia to complete the joint project, analogous and corporeal cues are of special importance. While the verbal dimension of directives is clearly valuable, the carers’ embodied enactments of the requested actions are exceedingly concrete and convey information beyond the spoken word. Indeed, there are parallels to be drawn between the present study and the episode described by Gjerens and Måseide (2020). Both involve joint actions that revolve around the use of external objects, show how carers orient to the doing of the participants living with dementia, and when needed, provide additional information to support their interlocutors in completing the ongoing joint projects.

Pursuing completion: joint commitments and responsibilities
Looking at all directive-response sequences in our collection, the caregivers completed just above 10 % of the initiated joint projects. We would like to argue that this is a rather unexpected finding given the fact that the enrolled participants living with dementia (i) had no previous experiences and knowledge of using tablet computers, and (ii) experienced cognitive and communicative challenges. As a consequence, one could have expected the carers to take primary responsibility for operating the devices, and thus solving any troubles through completing tasks themselves. Further, this finding is especially unexpected considering that the participants received no instructions regarding reaching or learning as an objective with their activities.

We argue that a possible explanation for why the enrolled carers pursue completion following an insufficient response to an initial directive, is the participants’ mutual commitments to the joint activity (Clark, 2006). That is, by virtue of responding to a carer’s directive, whether being with immediate or incoherent compliance (Craven & embodied enactments of the requested actions are exceedingly concrete and convey information beyond the spoken word. Indeed, there are parallels to be drawn between the present study and the episode described by Gjerens and Måseide (2020). Both involve joint actions that revolve around the use of external objects, show how carers orient to the doing of the participants living with dementia, and when needed, provide additional information to support their interlocutors in completing the ongoing joint projects.

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While the provision of upgraded directives, in most instances, enabled the participants living with dementia to complete the ongoing joint projects (category ii), there were also sequences in which the carers ultimately performed the requested actions themselves (category iii). In line with the argument of joint commitments and mutual supportiveness raised above, that a carer took over responsibility for completing the joint project appeared to be a last resort, occurring first after several turns of upgraded directives. Indeed, as highlighted in Excerpt 5, all essential scaffolding in terms of providing verbal and embodied cues regarding the what, how and where of the requested action had been offered (lines 7, 9 and 10) before the carer closed the joint project.

The trajectory of joint projects
Even though our material included numerous joint projects, they unfolded through the same type of contributions with only slight variations regarding the overarching trajectories (see Fig. 1).

Typically, the carer would initiate a new joint project through a directive (a). In the following turn, the response from the participant living with dementia would be either one of compliance, that is, a
sufficient response (b), or incipient compliance, that is, an insufficient response (c). In the case of (b), the current joint project was accomplished; and in the case of (c), the carer would upgrade the initial directive with additional verbal or embodied cues (d). At times, multiple turns of upgraded directives were necessary, creating a loop between (c) and (d), until (b) was reached. If (b) was not reached, despite several upgraded directives, the joint project was ultimately accomplished by the carer (e). Tying back to Table 2, the participants reached (b) in 87.1% of all cases, thus (e) is to be considered an exception to the general pattern.

As illuminated through Fig. 1 and the included excerpts, there was clearly an asymmetrical distribution of interactional labor within these dyads (Hyden, 2014; Majlesi & Ekstrom, 2016). Throughout our data, it was the carers who took on responsibilities for both progressing through the joint activities by initiating joint projects, and for including the individuals living with dementia as active co-participants. In a previous case study (Ingebrand et al., 2020), where we specifically analyzed data from Ida and Max (one of two spouses included in the present study), we found a distribution of interactional labor similar to what is presented in Fig. 1. Thus, this study corroborates our previous findings.

One limitation with the present study is the lack of detailed information regarding how many years the enrolled participants have lived with their diagnoses. Consequently, a suggestion for future research is to explore whether there is any relationship between the need of increased support during novel activities and the length of time since the dementia diagnosis was made.

Conclusion

In line with previous findings (Ingebrand et al., 2021, 2022), this study suggests that people living with dementia may actively engage in activities involving tablet computers, despite having no previous experiences of using the technology. A central contribution to the existing research regards the interactional efforts of both professional and family carers in facilitating the participation of people living with dementia in novel activities. Indeed, this study shows how carers, through attentively constructed directives (whether upgraded or not) and continual commitment to the ongoing joint activities, enable people living with dementia to be proficient co-participants. This implies that it is both possible, and likely highly valuable (cf. Müller & Mok, 2014; Quinn & Blandon, 2017), to include people living with dementia in novel activities.

The findings from the present study further stress the importance of utilizing modalities beyond the spoken word when engaging people living with dementia in joint activities (cf. Hyden, Majlesi, & Ekstrom, 2022). We argue that increased acknowledgement, awareness, and attention to non-verbal aspects of interactions involving people living with dementia would greatly improve dementia care training programs.

Declaration of Competing Interest

The authors declare that there is no conflict of interest.

Data availability

The authors do not have permission to share data.

Acknowledgement

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Appendix A. Appendix

Appendix A. Appendix

Table A.1: Transcription Conventions

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>Square brackets mark overlapping speech or embodied conduct</td>
</tr>
<tr>
<td>≤</td>
<td>Equal sign indicates no break or gap between the lines</td>
</tr>
<tr>
<td>(0.5)</td>
<td>Numbers in parentheses indicate silence in seconds</td>
</tr>
<tr>
<td><code>word</code></td>
<td>Double signs surround quiet speech</td>
</tr>
<tr>
<td>_</td>
<td>Underlining indicates emphasis</td>
</tr>
<tr>
<td>–</td>
<td>A hyphen indicates cut-off</td>
</tr>
<tr>
<td>:</td>
<td>Colon indicates prolongation of the prior sound</td>
</tr>
<tr>
<td>,?</td>
<td>The punctuation marks indicate intonation. The period indicates falling intonation, the comma indicates continuing intonation, and the question mark indicates rising intonation</td>
</tr>
<tr>
<td>&quot;word&quot;</td>
<td>Asterisks surround laughter</td>
</tr>
<tr>
<td>:word ← word :</td>
<td>Gesture and action descriptions are delimited between two identical symbols (one symbol per participant) and are synchronized with corresponding stretches of talk</td>
</tr>
<tr>
<td>← word → A</td>
<td>Gesture or action described continues across subsequent lines until the symbol of said participant is reached</td>
</tr>
</tbody>
</table>

References


Full length article

People living with dementia collaborating in a joint activity

Elias Ingebrand a, c, * , Christina Samuelsson b, c, Lars-Christer Hydén a, c

a Division of Aging and Social Change, Linköping University, Linköping, Sweden
b Department of Clinical Science, Intervention and Technology, Karolinska Institutet, Stockholm, Sweden
c Center for Dementia Research (CEDER), Linköping University, Linköping, Sweden

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ABSTRACT

Recent research has stressed the collaborative competences of people living with dementia, showing how they are capable of participating in a multitude of everyday activities when supported by cognitively healthy individuals. However, little is known about the collaborative work between different people living with dementia. Accordingly, this study aims to explore how people living with dementia, without the support of a cognitively healthy interlocutor, collaborate with other people living with dementia in an unfamiliar activity. The study is based on video recordings of three dyads, each comprising two individuals living with dementia, as they are using tablet computers with reminiscence and communication aiding applications. Drawing on multimodal interaction analysis, we show how the participants living with dementia treat the activities as joint endeavors and, when needed, engage in problem-solving sequences where they make their knowledge about how to progress within the activities publicly visible to their interlocutor. Our findings suggest that people living with dementia do collaborate with each other, and that the interactional labor between different people living with dementia is more symmetrical than what has been described in joint activities involving people living with dementia and cognitively healthy individuals.

1. Introduction

Over the past decade, research on how people living with dementia manage to cope with challenges, due to cognitive and communicative impairments, in everyday activities has gained increased attention. This research has emphasized the importance of collaboration between people living with dementia and cognitively healthy individuals, such as spouses and other family members providing informal care in the home environment, or formal caregivers working in residential care facilities (Gjerns & Måseide, 2019; Majlesi, Ekstrom, & Hydén, 2019; McCabe, Robertson, & Kelly, 2018; Samuelsson & Hydén, 2017). A main finding has been that cognitively healthy individuals take on increased interactional responsibilities in everyday activities, enabling people living with dementia to perform beyond what they could do in unassisted instances (Hydén & Forsblad, 2018). Drawing on these discoveries, this paper is concerned with an issue that has received little attention in research thus far, namely how people living with dementia collaborate with other people living with dementia, with little or no access to the guidance of a cognitively healthy interlocutor.
1.1. Collaboration and interactional asymmetries in activities involving people living with dementia

Collaboration, inevitably, entails two or more parties doing something together. As emphasized by Clark (1996), people working together in everyday activities, however mundane or complex the activities might be, engage in joint activities. Joint activities are usually definable by an overarching goal or purpose that the participants share, at least to some extent, and pursue in their interaction (Clark, 1996; Gambi & Pickering, 2011; Hyden, 2018). Additionally, joint activities commonly comprise numerous smaller joint projects, each with their own sub-goals (Bangert & Clark, 2003). Joint projects are temporally bounded with an opening phase where participants initiate and engage in the joint project at hand, a main body where participants carry out the principal business of the joint project, and a closing phase where the ongoing joint project is terminated and/or a new joint project is instigated, thus achieving progression within the activity (Bangert & Clark, 2003; Heesen, Genty, Rossano, Zuberbühler, & Bangert, 2017). In the present study, as will be seen in the results section later, the participants are engaging in the joint activity of using multimedia reminiscence and conversation aiding applications on an iPad. Their joint activities are composed of several joint projects, such as selecting categories and media types, browsing images in slideshow view, and changing applications by accessing the home screen of the iPad.

The realization of joint activities, and any incorporated joint projects, is contingent on the ongoing and incremental coordination of the involved participants’ verbal and embodied contributions to the unfolding activity (Bangert & Clark, 2003; Clark, 2006). That is, participants in interaction are mutually responsive to each other’s conduct, and on a turn-by-turn basis they produce their contributions in relation to what has come before, and by doing this their current contribution shapes what will follow in the activity (Clark, 1996; Sacks, Schegloff, & Jefferson, 1974). It is through these contributions that a participant can make his or her current state of understanding visible to the other participant(s) (Clark & Krych, 2004). An important matter raised by Hyden and Forsblad (2018) regards the fact that although joint activities are commonly characterized by a principal goal or purpose, the turn-by-turn organization of new contributions allows the involved participants to negotiate and revise the purpose of the unfolding activity. While joint activities indeed depend on, and progress through, the coordinated contributions of all engaged participants, participation in joint activities is rarely symmetrical. Instead, Linell (1998) claims that joint activities, or communicative projects to use Linell’s term, are “collectively accomplished, but often, indeed characteristically, with an asymmetry of participation. Therefore, actions also generate an asymmetric distribution of epistemic and practical responsibilities” (p. 221).

Asymmetries in interaction derive from a multitude of conditions between the participants engaged in joint activities. As hinted above, patterns of asymmetrically distributed interactional labor typically occur due to differences in the participants’ epistemic access (i.e., situated displays of being more/less knowledgeable), and/or their interactional entitlements and responsibilities in the joint activity at hand (Enfield, 2011; Linell, 2009; Linell & Luckmann, 1991). In joint activities, the participants’ asymmetrical division of interactional labor might occasion one participant to ‘dominate the interaction, locally or more globally, by taking more of initiatives and trying to steer and control the other’s responses’ (Linell, 2009, p. 214). Even though most joint activities in everyday life involve some level of asymmetrical relationship between the involved participants, interactional asymmetries are perhaps most conspicuous in interactions where one participant is living with cognitive or communicative disabilities, such as dementia (Linell, 1998, 2009; Majlesi & Ekstrom, 2016; Wilkinson, Rae, Rammussen, 2020).

In interactions involving people living with dementia, it is central to stress the heterogeneity of the clinical population. Importantly, dementia is not one specific disease, but a syndrome caused by a multitude of possible underlying etiologies (Whalley, 2015). Not only do different types of dementia diagnoses differ regarding the severity and characteristics of cognitive or communicative impairments, but also people living with the same dementia diagnosis might experience different symptoms as being more or less pronounced (Marcuson, Blemnow, Skoog, & Wallin, 2011; Marshall, 2009). Keeping the heterogeneity in mind, there are some common cognitive and communicative symptoms of dementia that bring about the asymmetrical division of interactional labor in joint activities. Frequently reported issues relating to dementia and interaction include word-finding difficulties, problems with retrospective telling, difficulties in asserting knowledge, diminished language comprehension, and troubles with following ongoing conversational topics or suddenly introducing topical shifts (Hamilton, 2019; Hyden, 2018; Jones, 2015).

As argued by Ekstrom, Lindholm, Majlesi, and Samuelsson (2017), the fact that people living with dementia often face communicative difficulties has contributed to the perception of them as passive and uninvolved interlocutors. However, results from recent studies on collaboration in everyday activities between cognitively healthy participants and people living with dementia clearly dismisses this notion (for example, see Ingebrand, Samuelsson, & Hyden, 2020, 2021; Majlesi et al., 2019). A key finding regards how the performance of a participant living with dementia can be scaffolded (Wood, Bruner, & Ross, 1976) by the participant(s) without dementia (e.g., Gjerris & Måseide, 2019; Hyden, 2014). Scaffolding entails a redistribution of interactional labor, where the cognitively healthy participants take on increased responsibilities in the joint activities and thereby aiding the participants living with dementia to access the linguistic or cognitive resources needed to partake (Hyden, 2018). Hyden and Forsblad (2018) describe how cognitively healthy participants might scaffold the overall progression and framing of the activity by keeping track of what has been done so far, and what is yet to be done in the joint activity. Their responsibilities might also entail the need of reminding the participants living with dementia about the purpose of the unfolding activity. This is of importance since people living with dementia commonly experience difficulties with their prospective memory, that is remembering what they are currently doing, or what to do next (Hyden & Forsblad, 2018). Furthermore, cognitively healthy participants might scaffold the contributions of people living with dementia in the joint activity. This could, for example, be done by giving directives with embodied or verbal clues for the person living with dementia to follow (Ingebrand et al., 2020). Finally, if any problems occur in the joint activity, the cognitively healthy participant could provide scaffolding in the process of repairing the trouble (Hyden & Forsblad, 2018). In other words, the asymmetrical relationship between cognitively healthy participants and people living with dementia is what makes scaffolding practices feasible. In interactions involving people living with dementia, Hyden (2018) further claims that it is fruitful to think of joint activities, and any
included joint projects, as built around problem-solving sequences. The participants’ continuous problem-solving is not necessarily the same as the overarching goal of the activity, but rather a necessity for working out a mutual understanding on how to progress within the ongoing activity (Hyden, 2018).

In a previous study (Ingebrand et al., 2020), we showed how a woman living with dementia, who had no previous experience of using touchscreen technologies, over the course of six weeks learned how to perform basic navigational maneuvers on an iPad together with her cognitively healthy spouse. Akin to the results of other studies involving people living with dementia and cognitively healthy interlocutors (e.g., Majlesi & Ekstrom, 2016), there was initially a clear asymmetry in the participants’ interactional labor. Seen across all observed joint projects, the cognitively healthy spouse was dominating the progression of their joint activity e.g., by being the one who initiated new joint projects through producing directives for his wife to follow. Through the embodied and verbal directives, the cognitively healthy spouse scaffolded the main body of their joint projects by guiding his wife’s attention, and her subsequent conduct, towards the appropriate part of the iPad. In the same manner he was the one who instigated the closings of their joint projects. Further, the cognitively healthy spouse provided positive feedback following any appropriate conduct made by his wife. Interestingly enough, the directives and subsequent feedback from the cognitively healthy interlocutor gradually became less explicit whilst the responses from the woman living with dementia were produced in an increasingly direct fashion. That is, as the woman living with dementia became more competent in managing the iPad, less scaffolding was needed from the cognitively healthy participant and the division of their interactional labor progressively became more symmetrical. In other words, the distance between the “expert” and the “novice” became reduced. The idea of scaffolding is thus closely associated to Vygotsky’s (1978) notion of the zone of proximal development, in that more competent participants might facilitate the learning of less competent participants by structuring activities in appropriate ways. Besides facilitating learning, previous studies have demonstrated how cognitively healthy individuals, through the use of scaffolding techniques, can support people living dementia in preparing meals (Hyden, 2014; Majlesi & Ekstrom, 2016), producing autobiographical storytelling (Gjøen, 2017; Hyden, 2011, 2013) and managing personal hygiene (Jansson & Plejert, 2014).

1.2. Peer learning and knowledge displays

Indeed, there is a growing body of literature suggesting that people living with dementia, despite having significant cognitive and communicative impairments, are capable of managing a diverse range of everyday activities in collaboration with cognitively healthy interlocutors. As noted above, the use of scaffolding practices has been identified as an important resource for the progression of joint activities, facilitating the participation of people living with dementia and allowing them to perform in ways that would be difficult in unassisted instances (Hydén, 2014, 2018; Ingebrand et al., 2020). However, how people living with dementia manage and progress within activities in peer interactions, that is together with other people living with dementia, has to this date, and to our knowledge, not been explored in the existing literature. In joint activities between people living with dementia and other people living with dementia, any interactional asymmetries regarding the participants’ cognitive and communicative abilities, epistemic access, or interactional responsibilities would be less overt than in interactions between cognitively participants and people living with dementia.

Returning briefly to the notion of epistemic access in joint activities, in the present study we adhere to the treatment of knowledge as an interactional phenomenon, publicly displayed and managed through the participants’ verbal and embodied contributions to the ongoing activity (Goodwin, 2013; Linell, 2009; Stivers, Mondada, & Steenig, 2011). Accordingly, it is through their conduct that participants in interaction can position themselves as exhibiting certain knowledge (e.g., by conveying information or by correcting the other’s conduct), additionally they can orient towards the knowledge of their interlocutors (e.g., by requesting information) (Heritage, 2012; Yu & Wu, 2021). Importantly, participants’ positions as more or less knowing are not static, rather they are dynamically negotiated, contested, and demonstrated in the ongoing interaction (Melande, 2012; Mondada, 2011). Accordingly, the situated and dynamic nature of knowledge in interaction makes opportunities for peer learning possible since the involved participants operate within one another’s proximal zones of development, providing appropriate scaffolding to each other on different occasions in the ongoing activity (Blum-Kulka & Dvir-Gvirisman, 2010; Cekaite, Blum-Kulka, Grover, & Teubal, 2014; Rogoff, 1990). By examining the potential epistemic positionings of the participants during an activity, their construction of what is perceived to be possible learning content(s) there-and-then, further becomes available for the analyst (Tanner & Sahlinström, 2018). As much of everyday life in residential care facilities entails interactions between people living with dementia, we argue that it is of utter importance to address how joint activities are managed in peer interactions with little, or no, access to the expertise of cognitively healthy individuals.

2. Aim

From previous research on everyday activities involving people living with dementia and cognitively healthy participants, it has been demonstrated how joint activities are organized in ways that enable a participant living with dementia to perform beyond his/her individual abilities (Hyden, 2014; Majlesi & Ekstrom, 2016). Less is known about how people living with dementia engage in joint activities with other people living with dementia. Accordingly, the aim of this study is to further understandings of how people living with dementia, together with other people living with dementia, and with limited or no access to the expertise of a cognitively healthy participant, organize their interaction to progress within the unfamiliar activity of using tablet computers. Further, our analytical interest concerns how, if at all, people living with dementia display their own knowledge of managing tablet computers in the ongoing interaction and/or orient to the knowledge of their interlocutors.
3. Methods and material

3.1. Participants

A total number of six participants living with dementia, four women and two men, were recruited for participation in this study (for characteristics, see Table 1). All participants were, at the time of their enrolment, living in residential care facilities located in two municipalities in the central part of Sweden. The participants were between 79 and 96 years of age at the time of data collection (2018–2019). Additionally, Julia and Becca, two formal caregivers volunteered to participate. The operational managers of each residential care facility assisted in the recruitment of the participants living with dementia.

All included residents were still verbal during their participation and lived with long-established and confirmed dementia diagnoses due to either Alzheimer's disease (n = 5) or unspecified major neurocognitive disorder (n = 1). While no formal testing was done to estimate the cognitive level of the participants living with dementia (e.g., through the Mini Mental State Examination), a symptomatic overview of each resident was obtained via the Cognitive Impairment Questionnaire (Åstrand, Rolstad, & Wallin, 2010). The questionnaire is an informant-based instrument frequently used in Swedish memory clinics which provides an indication of any current neurocognitive symptoms of the person living with dementia. According to the proxy-assessments made by the formal caregivers, who met the enrolled residents on a daily basis, all participants living with dementia experienced significant memory difficulties. As we did not identify any distinct differences from the attained questionnaires on items concerning the participants’ memory, visuospatial orientation, or language comprehension, that could clearly explain any individual differences from the results section, the Cognitive Impairment Questionnaire responses will not be used as a basis for discussion in the present study. Moreover, to be included for participation the participants living with dementia needed to be unfamiliar with using touchscreen technologies.

The names of all participants and places mentioned in this study are anonymized. Ethical approval was obtained from the Regional Board for Ethical Vetting at Linköping University (2017/469–31), and the data collection was permitted by all participants through written informed consents.

3.2. Data collection

The data used in this study are drawn from a larger corpus consisting of roughly 8 h of video recorded material of people living with dementia using tablet computers as a social activity in residential care facilities together with either formal caregivers or other people living with dementia. Apart from being asked to use the tablet computers whilst being video recorded, the participants received no further instructions on how to structure their interactions. For this study, all instances where a person living with dementia is using a tablet computer together with another person living with dementia were selected for further analysis. A total number of 7 recordings from three dyads of participants living with dementia was collected. The material included 3 recordings of Kate and Simon, 2 recordings of Iris and Roger, and 2 recordings of Judi and Geri. In the recordings, the participants are using tablet computers, either on a one-to-one basis, or with a formal caregiver or the first author present in the room. The length of the included video recordings varied from approximately 14 to 34 min, with an average length of 21 min. At large the data used in the present study amount to just below 2.5 h of recorded material. Prior to their participation, all residents were provided a personal tablet computer with access to a wide selection of pre-installed applications. However, in the excerpts provided below, the participants are primarily using two web-based applications, CIRCA and CIRCUS.

Both CIRCA and CIRCUS are developed to support everyday conversations involving people living with dementia by providing the users with photos, videos, and music to browse and discuss (Astell et al., 2018). While the applications are similar to each other, they differ with regard to the included content. CIRCA contains media content drawn from a large database of generic material which is accessed through pre-defined main topics and sub-categories (Fig. 1). The content found in CIRCUS, on the other hand, is locally uploaded by the user and saved in personalized albums or folders (Fig. 2).

The timeframe of the data collection was 4 weeks, and during this time the participants were encouraged to use their tablet computers on a daily basis either by themselves or together with a formal caregiver. During each recorded occasion of the dyads, the participants were asked to use one, or several, applications best suited to their liking. The first author recorded all activities through two discrete video cameras mounted on tripods, one positioned in a front-facing angle of the participants, and one positioned from a 45-degree angle. Throughout the recordings there are no indications of the participants commenting on, or taking notice of, the video recording equipment.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tr>
<td>Participant characteristics.</td>
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<td><strong>Age</strong></td>
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<tr>
<td>Kate</td>
</tr>
<tr>
<td>Simon</td>
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<tr>
<td>Geri</td>
</tr>
<tr>
<td>Judi</td>
</tr>
<tr>
<td>Iris</td>
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<tr>
<td>Roger</td>
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</tbody>
</table>
3.3. Data analysis

Methodologically, we ground our analyses of how the participants living with dementia organize and progress within the activities, and as such display their own, or orient towards their interlocutor’s knowledge of managing tablet computers, in practices of conversation analysis and multimodal interaction analysis (Goodwin, 2018; Sidnell & Stivers, 2013).

As a first analytical step, we examined the video recordings and noted any instances in which the participants living with dementia made efforts to progress within the ongoing activity by physically engaging with the iPad (e.g., by tapping on the screen). Further, the participant living with dementia had to produce the progression effort without (a) soliciting the assistance of a cognitively healthy interlocutor or (b) responding to a directive with explicit instructions produced by a cognitively healthy interlocutor in the preceding turn (e.g., “swipe your finger across the screen”). A total number of 97 instances which fit the criteria were identified and selected for further analysis. The selected material was subsequently transcribed following multimodal conversation analytic principles by the first author (Hepburn & Bolden, 2013; Mondada, 2018; See Appendix A for transcription conventions).

Subsequently, the first author repeatedly went through the transcripts, scrutinized the video recordings, and made an initial categorization of the progression efforts made by the participants living with dementia. Following this, the second and third author
independently screened the transcriptions and the suggested categorizations. Any disagreements were collectively discussed until consensus was reached. As a last step, all excerpts presented in this study were translated from Swedish to English.

Three categories of progression efforts were established from the collection of included instances. Efforts to progress within the ongoing activity made by the participants living with dementia were either (i) accomplished without any preceding negotiations ($n = 58$), or the progression efforts were produced in problem-solving sequences where the participants living with dementia negotiated on what to do next, and how to do this. At times, the participants engaged in (ii) extended problem-solving sequences with multiple efforts to progress without managing to complete the joint project at hand ($n = 15$), however, and commonly so, the participants were able to (iii) complete the current joint project within a few turns through their negotiations ($n = 24$), thus enabling progression within the joint activity.

4. Results

In this section, results from the three identified categories of progression efforts are consecutively presented, and further elucidated through excerpts which we consider to be representative cases of said categories.

A quantitative overview of the participants’ progression efforts within the joint activities is presented in Table 2.

4.1. Progression accomplished without negotiation

In our analysis of progression efforts made by the participants living with dementia, efforts initiated and accomplished, without any prior negotiations on the interational move, was the most frequently observed type. However, as is clearly seen in Table 2, there were great individual differences amongst the participants in how often they progressed within the activity through this type of progression effort.

Progression efforts accomplished without negotiations were realized without any explicit involvement of the other interlocutor(s). That is, a participant living with dementia initiated and carried out the action without first being told what to do, and further without asking for assistance on how to proceed. In doing this, the participant living with dementia made his or her knowledge of managing the tablet computer publicly visible to his or her peer and any others present in the room.

The following excerpt is from the third recording of Kate and Simon. The participants are sitting next to each other with a tablet computer placed in front of them on a table. Julia, a formal caregiver, and the first author are also present in the room, though not seated at the table. In the example, Kate and Simon are seen using the CIRCU application, looking at an album containing photographs of their municipality and its surroundings.

In Excerpt 1, Kate clearly takes the lead in progressing within the activity by accomplishing two progression efforts (lines 2 and 22). First, after identifying a building that she recognizes and wishes to discuss (line 1), she appropriately taps on the thumbnail to get a better view of the photograph. Following a rather lengthy discussion about whether the building is currently in use, and what it was used for (line 6-21), Kate initiates and accomplishes a second progression effort by swiping her finger across the screen to reveal a new photograph to discuss (line 22). Notably, Kate’s performance was not commented on, neither by herself nor by her interlocutors. The fact that Kate’s conduct provided no grounds for remarks or repair-work from the other participants suggests that she was treated as a competent actor, knowing what to do and how to do this (Mori & Koschmann, 2012).

While the progression efforts pertaining to the present category were initiated and carried out by a single participant, the ongoing conduct was commonly treated as a joint endeavor as will be shown in the following excerpt. Excerpt 2 is taken from the second recording of Roger and Iris as they are using the tablet computer by themselves, without any cognitively healthy individual present in the room. Just before the start of the excerpt, Roger and Iris had closed the CIRCU application by pressing on the physical home button, thus accessing the iPad home screen where the available applications are shown.

As Roger has a hard time seeing the titles of the various applications without his glasses (as is evidenced in line 7), he solicits assistance from Iris (line 1). Not only does Iris treat Roger’s turn as a request for reading the titles aloud (line 3), but also as a proposal of engaging in the joint project of selecting an application. After the absent possible uptake from Roger (line 4), Iris explicitly abandons the selection of the piano mimicking application Virtuoso by stating “no we’ll go for something else then”. In overlap with Roger’s turn (line 7), Iris makes an effort to progress within the activity by tapping on the physical home button. However, as her conduct does not lead to the expected outcome (as evidenced in Iris’s account “no it does not want to at all”, line 8), Iris abandons her current endeavor.

<table>
<thead>
<tr>
<th>Table 2</th>
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<tbody>
<tr>
<td>Summary of progression efforts.</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Kate</td>
</tr>
<tr>
<td>Simon</td>
</tr>
<tr>
<td>Gert</td>
</tr>
<tr>
<td>Judd</td>
</tr>
<tr>
<td>Iris</td>
</tr>
<tr>
<td>Roger</td>
</tr>
<tr>
<td>Total</td>
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E. Ingebrig et al. Learning, Culture and Social Interaction 34 (2022) 100629

01 Kate: *that I know is it pr- is it a prison? or institute it says.
02 kate *points to the thumbnail of an image in gallery view-->
03 (3.0) (4.4)
04 Kate: *taps on the thumbnail, the image opens in slideshow views
05 (0.9)
06 Kate: is it being used? [no it's empty
07 Julia: [no]
08 Auth: [I think they're making [apartments of it actually
09 Kate: [but it is-] [yes: it's nice that the buildings are
10 allowed to remain?
11 Auth: mi it's great.
12 (4.2)
13 Auth: do you recognize it Simon?
14 Simon: I do not recognize it where is it from then?
15 Auth: the institute,
16 Simon: oh (0.9) yes it says- yes yes
17 Kate: ah: what kind of institute was it do you know
18 Auth: no I- I do not know that
19 Kate: no: at home we had epileptics (1.1) but eh aand and then those
20 who came from the second world war.
21 Auth: mm m
22 Kate: but eh: then they probably had another problems too.
23 kate *swipes her finger across the
24 screen and an image of an avenue appears
25 (0.5)
24 Kate: oh that's beautiful

Excerpt 1. Progression accomplished without negotiation.

01 Roger: do you see that text what it says under (.). the tiles,
02 (1.2)
03 Iris: +here it says vi-+(1.4) nah virtuoso
iris *points to the application "Virtuoso"+
04 (2.9)
05 Iris: what doe- no: we'll go for something else then
06 (1.4)
07 Roger: I might *fetch my glasses too+ in order to manage this I think
iris: *lightly taps on the physical home button two times, no response from the device+
08 Iris: no it does not want to at all
09 Roger: .no
10 Iris: +in+ that case we'll go with images then. =
iris *taps on "Photos" and the application starts+
11 Roger: *yes-
12 Iris: =album?

Excerpt 2. Progression accomplished without negotiation.

and instead initiates a new progression effort by aptly tapping on the Photos application, thus effectively closing their ongoing joint project of selecting an application and opening a new joint project of viewing photographs available from the camera roll (outside the scope of this excerpt). Even though Iris undoubtedly acts as a driving and competent participant in this excerpt, able to progress within the activity without seeking assistance from Roger, Roger is by no means passive. Indeed, Roger displays a determination to progress within their activity (lines 1 and 7), is attentive towards Iris’s actions (lines 9 and 11), and in this fashion certainly treats the project as a joint endeavor.

4.2. Problem-solving sequences without accomplished progression

All dyads in the present study encountered difficulties in managing progression within their joint activities at some point, this despite engaging in negotiations on how to proceed. The occurrence of extensive problem-solving sequences, usually lasting well over 10 turns without any progress being made, were invariably observed when the dyads were sitting by themselves without any
cognitively healthy interlocutors present in the room. Characteristically, the dyads’ negotiations following an initial progression effort by a participant living with dementia lasted until assistance was provided by a cognitively healthy participant upon re-entering the room, or until their current joint project was abandoned for a new one (e.g., by closing an application with the physical home button, as was the case preceding Excerpt 2).

In Excerpt 3, Judi and Geri are sitting unaccompanied in a common space room of their residential care facility using the CIRCA application together. The excerpt is from the second recording of Judi and Geri, and it is the first time that they are using the tablet computer by themselves. Prior to the start of this excerpt, Judi and Geri selected the main topic entertainment, thus accessing a screen with a silhouette of Laurel and Hardy, and written instructions to “select between photos, videos or music, or choose another topic”. As will be seen in the excerpt, Judi and Geri are facing a problem of finding the designated on-screen buttons to select a media type, located at the bottom part of the screen, and instead attempt to progress through tapping on the words in the instructions.

The sequence is initiated by Judi as she provides a candidate understanding of what needs to be done in order to progress within the activity through “we’ve gotta press on something then we’ll see” (line 1–2). By using the second person plural “we”, Judi
01 Kate: what would you like to see. famous people? news headlines?
02 Simon: famous people
03 Kate: take something?
  simon +taps on "famous people" with his fingernail first, no
  response from the iPad+
04 (3.5)+.+
  simon +taps on "famous people", again with his fingernail first,
  no response from the iPad+
05 simon +#(1.8)+
  fig #fig.1
  turns his palm upwards and raises his eyebrows+
06 Kate: yes but if you do like this &
  kate +taps her finger on "famous people"
  and the content starts loading&
07 Kate: there he +is+
  simon +taps on the main topic "people and events", thus
  canceling the ongoing loading+
08 (4.3)
09 Simon: this eh- is he outside= 
10 Kate: =m:
11 (3.6)+(0.3)+
  simon +taps on the media type "photographs" twice, a window with
  sub-categories opens and closes again+
12 Simon: +you=
13 (2.0)+(.)&
  kate +taps on the media type "photographs" twice, again opening
  and closing the window with sub-categories&
14 Kate: there yes&
  auth +enters the room+
15 Kate: it was about how [one shou-
16 Auth: [doesn't it want to? 
17 Simon: +yes well photographs+
18 Simon: +points to the media type "photographs"+
19 Auth: +yes? and try one +time+
  simon +taps on "photographs" and the window with
  sub-categories opens+
20 Simon: oh=
21 Kate: =oh
22 Kate: what is- hh .mt
23 Kate: important events could be interesting+
  kate +taps on "important events" and the
24 content starts loading&
25 Auth: exactly [and then-
26 Kate: [oh it's the same [guy
27 Auth: [then it just takes some [time for it
28 Kate: [oh
29 Auth: to load the new images
30 ((the slideshow starts))

Excerpt 4. Problem-solving sequence without accomplished progression.
further establishes her proposal as a joint project. Geri sides with Judi’s understanding (line 3), upon which Judi pursues her initial proposal by asking what media type they should choose (lines 4 and 6). In the turns following Geri’s assertion that “photos might be best” (line 6), the dyad’s interactional work resembles what is commonly seen in interactions between people living with dementia and cognitively healthy interlocutors (Ingebrand et al., 2020, 2021). Through her verbal directive “well press then” (line 9), her subsequent monitoring and verbal feedback of Geri’s conduct (line 10–11), Judi positions herself as a knowledgeable participant capable of directing and scaffolding the unfolding activity. Notably, Geri also orients towards Judi as a knowledgeable participant. First, she first responds to Judi’s verbal feedback as noteworthy with “oh between” (line 12), an oh-preceded repeat signaling that Judi observed something unfamiliar to Geri (Persson, 2015). Second, albeit the fact that Geri’s turn is cut-off, “well where was it” (line 14) is hearable as a request for assistance, projecting a correction from Judi in the subsequent turn. However, unlike what one would expect from an interaction involving a cognitively healthy participant, Judi offers no correction of Geri’s preceding action but instead initiates another sequence of deciding what media type they should select (line 15–16). Following their discussion (line 17–34, omitted in the transcript), Judi and Geri agree to select videos next (line 35–36). This time, Judi performs the progression effort by tapping on the word “videos” in the instructions (line 37). After a pause of 2.8 s with no response from device, Judi repairs her conduct by tapping on the word from another angle (line 38), again without results. Finally, by stating “but it doesn’t work” (line 39), Judi both displays an awareness of not meeting the expected outcome of their local joint project and moreover she holds the device accountable for not responding to her conduct (Ingebrand et al., 2021). Shortly after what is shown in Excerpt 3, Becca, a formal caregiver, enters the room and assist the dyad in selecting a media type whereupon their activity continues.

Unlike what was shown in the previous excerpt, in Excerpt 4 the dyad explicitly recruits external assistance after being unable to progress through their own attempts. The sequence is from the third recording of Kate and Simon as they are using the CIRCA application by themselves. The first author is in the hallway outside the room talking to a formal caregiver. As the excerpt begins, the dyad had selected the main topic and events, showing a silhouette of John F. Kennedy, chosen the media type photographs, and accessed a window showing various sub-categories.

There are many similarities to be found between Excerpt 3 and Excerpt 4. Like Judi, Kate positions herself as a driving participant by initiating their joint project of selecting a sub-category of photographs and asking Simon about his preferences whilst reading possible alternatives aloud (line 1). Following Simon’s reply (line 2), she produces the verbal directive “take something” to which Simon, in overlap with Kate’s turn, responds to by tapping on the sub-category famous people. As there is no response to his initial progression effort, Simon attempts to repair his conduct (line 4). However, Simon’s self-repair is unsuccessful as he once again taps on the screen using his fingernail. Notably, Kate treats Simon’s gesture following the unsuccessful progression efforts (line 5) as a request for assistance and, unlike what was seen in the previous excerpt, Kate subsequently provides a correction by stating “yes but if you do like this” and aptly tapping on the sub-category upon which the content starts loading (line 6). By doing this, Kate takes on responsibilities for progressing their joint project and publicly displays her knowledge of how to do so. As the content is loading, the window with subcategories closes and the silhouette of John F. Kennedy is visible. In overlap with Kate’s turn “there he is” (line 7), audibly referring to the silhouette, Simon taps on the main topic and events upon which the ongoing loading is cancelled. While Simon regulated his way of tapping following Kate’s correction, it is clear from his subsequent turn, following a long pause of 4.3 s, that his conduct did not lead to the expected outcome. By asking “is he outside” (line 9), Simon stimulates the first step of soliciting external assistance. Following Kate’s affirmative response, Simon makes another progression effort (line 11). Again, even though he is tapping on the screen in the appropriate fashion, his conduct does not lead to the expected outcome which is evident in line 12 where Simon pursues his request of external assistance by gazing out into the room, shaking his head, and loudly saying “you”, thus summoning the attention of the first author who subsequently enters the room. In line 13, Kate is seen repeating what Simon just did, that is tapping on the media type twice thus opening and closing the window with alternatives. Notably, Kate treats Simon’s summoning of the first author as a joint project by being the one who initiates a problem formulation with “it was about how one shou” (line 15), though she is cut-off by the first author who asks “doesn’t it want to” (line 16). Subsequently, Simon addresses their problem by pointing to the media type and uttering “yes well photographs” (line 17). In the following turns, Simon adequately resolves their current problem, following the provided assistance (line 18), and Kate proficiently selects a sub-category to discuss (line 22), this time being informed about the loading time (lines 25 and 27).

1 Roger: then we can press on it (1.1) and something will happen.
2 Iris: where should one go to then?
3 Julia: [it's] just to press on=
4 Roger: [well] [there's]
5 steps on the headline, the content starts loading
6 [>it's just<] [ah on that one now
7 Iris: yes on the name [yes exactly]=
8 Roger: [yea
9 ([a paused YouTube video appears])

Excerpt 5. Problem-solving sequence with progression.
1 Simon: what does it say here then
2 Kate: &mdash;
   kate moves the iPad closer to Simons
3 Simon: (mumbles) well tha- hh what eh:
4 Kate: well I don't know
5 (1.3)
6 Kate: what do you want?
7 (1.2)
8 Kate: &mdash;music?
   kate &types m on keyboards
9 (1.3)
10 Simon: &isbn this page?
   kate &types &isbn c---
11 (2.8) &isbn (1.8)
   kate &isbn &isbn
12 Kate: google &search
   kate &types on &music in the search suggestions and the iPad
   redirects them to a google search page
13 Simon: choose b= "ahh"
14 Kate: =there
15 Simon: eh choose between [the categories
16 Kate: [here is björns skifs
   kate &points to a news article
17 (0.8)+(3.3)+(.)+
   simon +points to the article+taps on the article from an angle,
   the webpage scrolls downwards
18 Kate: m:
19 (2.6)+(.)+
   simon +taps on the news article again, no response from the iPad
20 (1.2)
21 Simon: but what the hell +it [does+
   simon +taps his finger next to the image of the news
   article, no response from the iPad
22 Kate: [yes press then?
23 (0.5)+
   simon +rests his finger on the thumbnail of the news article, no
   response from the iPad
24 (0.3)+(.)+
   kate &taps her finger on the news article and the new page
   appears
25 (1.7)
26 Kate: one shou- &one should probably only press a bit,=
   kate fig
   fig #fig.1
27 (4.8)
In the following, two excerpts of when the participants living with dementia manage to progress within the joint activity through their collaborative efforts, without soliciting assistance from a cognitively healthy participant, are presented. Characteristically, any issues that arose in the sequences pertaining to this category were resolved within a few turns, allowing the participants to progress with their joint activity. In our data, these sequences were observed both when the participants living with dementia were sitting by themselves, and when a cognitively healthy participant was present in the room.

The next excerpt is from the first recording of Roger and Iris who are using the CIRCA application together with the formal caregiver Julia. Preceding Excerpt 5, the dyad had chosen the main topic recreation, Iris had selected the media type video, and as the excerpt begins, they had just decided on viewing a performance by the Swedish singer Evert Taube which was listed in the window of alternatives.

With clear resemblance to the opening of Excerpt 3, this sequence is initiated by Roger who produces a candidate understanding of how to progress within the activity with “then we can press on it and something will happen” (line 1). By responding with the question “where should one go then” (line 2), Iris treats Roger’s proposal as a legitimate next action, but at the same time she displays a lack of understanding regarding where to press, and explicitly requests further information. As Iris did not orient towards a specific next speaker in her turn, both Roger and Julia, the formal caregiver, self-select to provide assistance in overlap with each other (line 3–4).

Notably, Roger both verbally responds to Iris’s request of where one should go by responding “well there”, and takes on the responsibility of progressing their joint activity by tapping on the headline of the video, upon which the content starts loading. The fact that Julia abandons her ongoing turn following Roger’s conduct in line 4 indicates that she treats his response as sufficient, therefore there is no need to pursue her current response. In line 5, Iris produces a verbal formulation of Roger’s preceding turn with “ah on that one now”, thus claiming a newfound understanding of where to press. Finally, Iris’s formulation is affirmed by Julia and Roger (line 6–7), the selected video appears (line 9) and they continue with their joint activity.

In the final excerpt, taken from the second recording of Kate and Simon, the participants are using the tablet computer without any cognitively healthy participant present in the room. Prior to Excerpt 6, the participants were using the CIRCA application, however, Kate bumped her finger on the address bar at the top of the screen causing a keyboard and the google search engine to appear, and by doing this CIRCA was concealed. Approximately 8 s of silence precedes line 1.

Following the lengthy pause preceding the excerpt, during which both participants were silently gazing towards the screen, Simon (line 1) is seen instigating a problem-solving sequence with ‘what does it say here’. Kate notably treats his initiative as a collaborative endeavor by placing the iPad in front of Simon (line 2), thus giving him greater access to this shared semiotic field (Goodwin, 2018). However, as is clearly seen in the subsequent turn where Simon mumbles and aborts his turn-in-progress (line 3), him being able to see the tablet computer more closely does not solve their problem. Subsequently in line 4, Kate aligns herself with Simon’s displayed lack of understanding through ‘well I don’t know’. Without any response in line 5, the problem-solving sequence initiated by Simon is effectively abandoned without any progression efforts being made from either participant. However, the activity progresses as Kate invites Simon to a new joint project (line 6) thus positioning herself as a competent and driving participant. With there being no uptake from Simon in line 7, Kate produces the candidate suggestion ‘music’ (line 8) and further displays her knowledge of how to manage the keyboard by typing the word (line 8–11). With “on this page” (line 10), Simon produces what could be heard as a request for clarification, however there is no uptake to his request. Instead, Kate pursues the project launched by her in line 6 and, again, displays her competence of managing the iPad by tapping on ‘music’ in the search suggestions (line 12) and thereby leaving CIRCA for a new web page.

In lines 13 and 15, Simon is repeating the written instructions from the CIRCA application, thus he does not display an understanding of their transition to the new page. Subsequently, Kate effectively draws Simon’s attention to a news article about the Swedish singer Bjorn Skifs by pointing to it (line 16). By pointing to a specific part of the screen, Kate produces an environmentally coupled gesture (Goodwin, 2007) to establish a shared point of visual focus with relevance for their unfolding activity. Whilst his conduct is unsuccessful, Simon takes the initiative to press on the article that Kate pointed to (line 17), thus displaying that he too treats their project as a joint endeavor. The fact that Simon repeats his action (line 19) and curses as he doesn’t get any noticeable response from the device (line 21) further displays that Simon is an engaged participant who perceives his conduct to be correct. In an overlapping turn, Kate aligns with Simon’s conduct as she explicitly encourages him to continue through ‘yes press then’ (line 22). As there still is no response from the iPad, despite Simon’s repeated attempts, Kate makes a gentle tap on the article, upon which it appears (line 24).

By virtue of explaining how one should press on the screen (line 26), Kate positions herself as a knowledgeable participant, but at the same time she is orienting to the progressivity of the activity as a joint accomplishment (otherwise there would be little use in addressing Simon). Moreover, in informing Simon about the fine details regarding how one should press on the screen, Kate constructs the specific action as a learnable object of relevance for Simon (Tanner & Sahlinstrom, 2018). The fact that Kate mitigates her explanation with the epistemic hedging “probably” and using the pronoun ‘one’ (rather than you) could be seen as a face-saving practice rather than a downgrading of her competences.

From the excerpts presented above, it is clear that all participants were actively engaged in the activities and treated what they were doing as a collaborative endeavor. Further, in all three identified categories of progression efforts, the participants living with dementia made their knowledge about how to manage the tablet computers, through both verbal and non-verbal means, publicly visible to their peers.
5. Discussion

Recently, a burgeoning number of studies have shown that people living with dementia, despite experiencing severe cognitive and communicative challenges, can take part in a wide range of everyday activities when provided appropriate support from others (c.f., Hyden, 2014; Ingebrand et al., 2020, 2021). By highlighting the collaborative work between people living with dementia and cognitively healthy participants, the common perception of people living with dementia as passive and uninvolved interlocutors has been challenged. Adding to this strand of research, the present study demonstrates that people living with dementia indeed are capable of organizing and progressing through joint activities, even without the support of a cognitively healthy participant by collaborating with their peers. To our knowledge this is the first study to explore collaboration between different people living with dementia, and from our results there are a number of findings we find important to raise. In the following, we will discuss (i) how the collaboration observed amongst the dyads differs from what is typically described in joint activities between people living with dementia and cognitively healthy interlocutors, (ii) how the participants living with dementia oriented towards one another in the activities, and (iii) how the tablet computers both facilitated and restricted progression within the joint activities.

First, the collaborative work observed amongst the included dyads differs from what has been described in joint activities between cognitively healthy individuals and people living with dementia. In the latter constellation, the cognitively healthy individual is typically the one who is responsible for scaffolding the overall progression of the joint activity by initiating, overseeing or performing the main body, and ultimately closing any comprising joint projects (Hyden & Forsblad, 2018). Further, cognitively healthy participants often pose known-answer questions, or recognition checks, such as “do you remember how X?” to people living with dementia (Ekstrom, Ferm, & Samuelsson, 2017; Schrauf, 2020; Small & Perry, 2005). The practice of asking known-answer questions is commonly seen in educational settings and activities when teachers are testing and evaluating the presupposed knowledge of their students (Mehan, 1979; Solem & Skovholt, 2019). Relating this to the present study, our findings suggest that the observed collaboration in joint activities between people living with dementia and their peers is rather symmetrical in nature as there are no pre-allocated or obvious expert participants to be found amongst the dyads as is the case in joint activities between people living dementia and cognitively healthy individuals. Indeed, as seen in Table 2 and the included excerpts, all participants were found to both initiate and carry out progression efforts, either without preceding negotiations or as part of the problem-solving sequences. Further, unlike what one would expect from joint activities between a cognitively healthy participant and a participant living with dementia, we found no instances of known-answer questions or evaluations of the other's conduct in our material.

Second, the participants living with dementia organized their activities in a strikingly similar fashion, both seen across the included dyads, and within the identified categories of progression efforts. Throughout our data we noted how the participants involved their peer in the interactive move to come. That is, the participants living with dementia typically sought the response of the other participant before, or during, the performance of a progression effort. The way in which the participants living with dementia involved their peer varied from explicit invitations and directives (e.g., lines 1 and 3 in Excerpt 4), to candidate understandings (e.g., line 1 in Excerpt 3) and formulations of ongoing or subsequent actions (e.g., line 10 in Excerpt 2). By involving their peer, the participants living with dementia treated the ongoing activity as a joint endeavor, secured the attention of their interlocutor, and further enabled the other to make his or her understandings of the current situation public. Moreover, our analysis showed that when a participant living with dementia was unable to accomplish a progression effort at hand, this was commonly signaled by the participant him- or herself. Similar to the involvement of a peer prior to a progression effort, discussed above, insufficient understandings of how to progress within the joint activity were signaled in a multitude of ways such as explicit requests for information (e.g., line 2 in Excerpt 5), using affective expressions (e.g., line 21 in Excerpt 6), providing accounts (e.g., line 8 in Excerpt 2), and gestures (e.g., line 5 in Excerpt 4).

Following any indications of insufficient understandings, the participant either tried to repair the performed conduct (e.g., line 38 in Excerpt 3), or the peer provided assistance in the subsequent turn (e.g., line 6 in Excerpt 4). The fact that the participants living with dementia made their lack of knowledge about how to progress within the activity public to their interlocutor(s), and in the same manner offered assistance when they had knowledge of how to proceed, shows that the participants were perceptive of both their own and their peer's conduct and displayed capabilities. We argue that the orientation to their peer, both in terms of soliciting and providing assistance, clearly highlights how the participants were capable of scaffolding the ongoing activity for each other and thereby creating opportunities for peer learning.

Third, apart from collaborating with each other, the included dyads unceasingly had to coordinate their actions in relation to the tablet computer. Gjerme and Måsöide (2015) and Gjerme (2017) have described how the use of physical artefacts in interactions involving people living with dementia might function as material anchors (Hutchins, 2005), providing stability and support in the ongoing joint activities. As an example, they found how an individual living with dementia, who experienced severe verbal and cognitive difficulties, was able to display competences that he could not have done in other activities when he had access to a guitar. The guitar became a material anchor for the overall activity, providing guidance for his actions, and secured the attention of his cognitively healthy interlocutors (Gjerme & Måsöide, 2015). In our data, the presence of the tablet computers, and the interface of the applications, undoubtedly influenced what the participants living with dementia were doing, and how they could do this. First of all, the device itself became a shared object of attention for the participants, providing stability to their joint activities as everything that they discussed and did was bound to the tablet computer and any applications currently in use. While the written on-screen instructions of the applications supported the participants in knowing how to do next (e.g., “select between photos, videos or music, or choose another topic”), there was no information about how, or where, to perform the conduct needed to progress within the activity. Further, with the exception of not responding to inadequate conduct, the tablet computers provided no feedback to the participants regarding what was wrong with their failed progression efforts. That is, it's not enough to know that you need to press on the screen in order to progress within the activity, you also need to know where to press (which was the main issue in Excerpt 3) and how to this
(neither with the fingernail first nor by double-tapping, as seen in Excerpt 4). Taken together, our results suggest that while the tablet computers did serve to anchor the attention of the included participants, and provided some general information about what to do next, the fine-grained details about how to manage the devices and the included applications were not to be found on screen but had to be elaborated through the participants’ continuous verbal and non-verbal problem-solving. Further, as mentioned previously, in joint activities involving both cognitively healthy individuals and people living with dementia, the cognitively healthy interlocutor is usually responsible for the overall framing of the joint activity. This includes keeping track of the progress achieved thus far, knowing what is left to do, and if necessary, reminding the individual living with dementia about the purpose of the activity (Hydén & Forsblad, 2018). Our results indicate that while the participants living with dementia were capable of solving problems as they occurred there- and then, they did not seem capable of framing the overall activity as pertaining to the use of CIRCA or CIRCUS. That is, unlike what one would expect from a cognitively healthy individual, the included participants were only capable of organizing their collaboration in relation to what was currently displayed on screen. This could explain why Kate and Simon did not try to return to CIRCA in Excerpt 6, but instead continued to the news article they had found on the Google search page.

To conclude, the present study suggests that people living with dementia are capable of managing novel activities in collaboration with other people living with dementia, even without the support of a cognitively healthy interlocutor. Moreover, we found how the participants oriented towards the displayed competences, or lack thereof, of their peers by soliciting or offering assistance in problemsolving sequences. Additionally, the distribution of interactional labor between people living with dementia and their peers appears to be more symmetric than what has been described in joint activities between cognitively healthy individuals and people living with dementia. By acknowledging the collaborative competences of people living with dementia, this study shows that even when residing in residential care facilities, people living dementia are not in constant need of the support from a cognitively healthy interlocutor.

Declaration of competing interest

The Authors declare that there is no conflict of interest.

Acknowledgement

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Appendix A

<table>
<thead>
<tr>
<th>Transcription Conventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Square brackets mark overlapping speech or embodied conduct</td>
</tr>
<tr>
<td>( ( ) ) Equal signs indicate no break or gap between the lines</td>
</tr>
<tr>
<td>(0.5) Numbers in parentheses indicate silence in seconds</td>
</tr>
<tr>
<td><em>word</em> Degree signs surround quiet speech</td>
</tr>
<tr>
<td>- A hyphen indicates cut-off</td>
</tr>
<tr>
<td>: Colon indicate prolongation of the prior sound</td>
</tr>
<tr>
<td>? The punctuation marks indicate intonation. The period indicates falling intonation, the comma indicates continuing intonation, and the question mark indicates rising intonation</td>
</tr>
<tr>
<td><em>word</em> Asterisks surround laughter</td>
</tr>
</tbody>
</table>

&omitted Gore and action descriptions are delimited between two identical symbols (one symbol per participant) and are synchronized with |

<word> corresponding stretches of talk |

| --> =>--A | Gesture or action described continues across subsequent lines until the symbol of said participant is reached |

References


