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

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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 eldercare services (Koumakis, Chatzaki, Kazantzaki, Maniadis, & Tsiiknakis, 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 & Baudin, 2021, p. 1220). As reported by several scholars (e.g., Bastoni et al., 2021; Cavenett et al., 2018; Zander, Gustafsson, Landerdahl 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 pertain in the future. Indeed, Frennert (2021) argues that the implementation of welfare technologies within eldercare 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; Ferm 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, & Hydén, 2020, 2022).
Dementia entails certain common difficulties in managing communication in face-to-face interactions and participation in everyday activities (Hydén & Antelius, 2017). Dementia is an umbrella term encompassing a broad spectrum of disorders and impairments causing cognitive, communicative, and behavioral symptoms (Müller & Schrauf, 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 (Scheltens et al., 2016). In the initial stages, people living with dementia primarily tend to experience difficulties relating to episodic memory functions, that is the ability of remembering autobiographical events and placing them in time and space, making retrospective telling a challenging endeavor (Hydén, 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 (Hydén & Forsblad, 2018; Morris & Becker, 2004). As reported in numerous studies, other cognitive-communicative challenges experienced by people living with dementia include word-finding difficulties (Ekström, Lindholm, Majlesi, & Samuelsson, 2017), minimal, delayed, or absent responses to a preceding turn at talk (Jones et al., 2016; Perkins, Whitworth, & Lesser, 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 visuo-perceptual and visuospatial changes (Jones & Van der Eerden, 2008). According to Marquie 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 Eerden, 2008; Marquie 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 Eerden, 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 stress that all social 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 (Bangert & Clark, 2005; Knutsen, 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 collaborative 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 (Hydén, 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 (Lellin, 2009). The asymmetrical distribution of interactional labor implies a shift of some communicative responsibilities from the individual living with dementia to the carer (Hydén, 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 (Hydén & Forsblad, 2018).

Directives as a resource

According to Lindwall, 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 Lein, 2017; Goodwin, 2006). Directives can be defined as “utterances designed to get someone else to do something” (Goodwin & Cekaite, 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 responsibilities in joint activities to facilitate the participation of people living with dementia. In this study, our focus is on the interactional organization of instructions in joint activities involving people living with dementia, who are novice tablet users, and their carers. Specifically, we will show how the carers’ directives might scaffold the coordination 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 managing 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 residential dementia care units, while two participants were still living at home. Moreover, eight care professionals and two family carers volunteered to take part in the study. The identification of eligible participants 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 minimum 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 participation, a symptomatic overview of the participants living with dementia, with exception for Ida, was obtained through the Cognitive Impairment Questionnaire (Astrand, Rolstad, & 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 Vetting at Linköping University (2017/469–31), 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 CIRCA and CIRCUS (Asell et al., 2018), two multimedia reminiscence and conversation 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>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Setting</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kate</td>
<td>83</td>
<td>Residential care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Roman</td>
<td>66</td>
<td>Residential care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Iris</td>
<td>79</td>
<td>Residential care</td>
<td>Unspecified dementia</td>
</tr>
<tr>
<td>Geri</td>
<td>96</td>
<td>Residential care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Judd</td>
<td>90</td>
<td>Residential care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Joan</td>
<td>55</td>
<td>Residential care</td>
<td>Substance induced dementia</td>
</tr>
<tr>
<td>Simon</td>
<td>90</td>
<td>Residential care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Roger</td>
<td>90</td>
<td>Residential care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Ida</td>
<td>52</td>
<td>Home care</td>
<td>Alzheimer’s disease</td>
</tr>
<tr>
<td>Emma</td>
<td>62</td>
<td>Home care</td>
<td>Alzheimer’s disease</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, 2018; 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 and transitioned between a joint project 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, haptic contacts; Goodwin & Ecekalke, 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 reissued 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 illuminated 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 carers 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 SVT 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
perform the action needed for them 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”). 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, specific video for them to watch, and thereby initiates another joint project (line 7).

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 directives (percent of directive-response sequences)</th>
<th>(ii) Sequences with upgraded directives (percent of directive-response sequences)</th>
<th>(iii) Upgraded sequences completed by a carer participant (percent of directive-response sequences)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emma</td>
<td>8</td>
<td>241</td>
<td>33 (1)</td>
<td>21 (63.6)</td>
<td>9 (27.3)</td>
</tr>
<tr>
<td>Geri</td>
<td>3</td>
<td>53</td>
<td>12 (2)</td>
<td>3 (25)</td>
<td>8 (66.7)</td>
</tr>
<tr>
<td>Kate</td>
<td>5</td>
<td>128</td>
<td>41 (3)</td>
<td>20 (48.8)</td>
<td>9 (22)</td>
</tr>
<tr>
<td>Iris</td>
<td>4</td>
<td>76</td>
<td>29 (4)</td>
<td>16 (55.2)</td>
<td>9 (31)</td>
</tr>
<tr>
<td>Judi</td>
<td>3</td>
<td>51</td>
<td>20 (4)</td>
<td>6 (30)</td>
<td>10 (50)</td>
</tr>
<tr>
<td>Joan</td>
<td>2</td>
<td>20</td>
<td>10 (5)</td>
<td>8 (80)</td>
<td>2 (20)</td>
</tr>
<tr>
<td>Simon</td>
<td>4</td>
<td>46</td>
<td>25 (5)</td>
<td>6 (24)</td>
<td>14 (56)</td>
</tr>
<tr>
<td>Roman</td>
<td>3</td>
<td>46</td>
<td>28 (6)</td>
<td>24 (85.7)</td>
<td>3 (10.7)</td>
</tr>
<tr>
<td>Ida</td>
<td>6</td>
<td>90</td>
<td>66 (7)</td>
<td>33 (50)</td>
<td>32 (48.5)</td>
</tr>
<tr>
<td>Roger</td>
<td>3</td>
<td>31</td>
<td>23 (8)</td>
<td>7 (30.4)</td>
<td>10 (43.5)</td>
</tr>
<tr>
<td>Total</td>
<td>41</td>
<td>782</td>
<td>287 (4)</td>
<td>144 (50.2)</td>
<td>106 (36.9)</td>
</tr>
<tr>
<td>Mean</td>
<td>4.1</td>
<td>78.2</td>
<td>28.7</td>
<td>14.4</td>
<td>10.6</td>
</tr>
<tr>
<td>Median</td>
<td>3.5</td>
<td>52</td>
<td>26.5</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Mode</td>
<td>3</td>
<td>46</td>
<td>–</td>
<td>6</td>
<td>9</td>
</tr>
</tbody>
</table>


01 Laura: +då kan vi se om du kan #dra bilden+ lite uppåt?
then can see if you can drag the image a bit upwards
Laura +repeatedly swipes her finger upwards just above the screen+
fig #fig.1

02 Laura: [som vi brukar göra
like we usually do
03 Roger: [8+yes
Roger &swipes finger upwards across the screen, page scrolls downwards&
04 Laura: bra: perfekt perfekt
good perfect perfect
05 Laura: lite till kan du sta om du har läst förrit
a bit more you can take if you’ve finished reading
Roger &continues scrolling--->
06 Laura: bra
Roger --&
07 Laura: +de där 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+

both within and across recordings, the initiatory directives rarely included descriptive cues. In the following excerpt, Ida 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.


Excerpt 2 is from the dyad’s third week of using the tablet computer and the depicted project transition, that is navigating to a preceding screen, had been carried out numerous times before by the participants.

However, unlike the two previous excerpts, Simon does not demonstrate immediate compliance. Instead, following a pause of 1.5 s, Simon re-specifying the projected course of action. Again, the initiatory turn is bit we

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).

Taken together, 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 participant 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 participant 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 cutting 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 tabletop (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 “yaa 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, Sahba, orients towards the doing of the participant living with dementia as the focal task at hand rather than simply demonstrating a specific action. In Excerpt 4, Sahba and Iris are using Sketchbook, an application for making illustrations and drawings. In the turns preceding this excerpt, Sahba had drawn a long squiggly line on the screen and informed Iris that one can remove it using an eraser. However, Sahba had some troubles finding the eraser on screen, trying various available tools. When the excerpt begins, Sahba had just identified the corresponding symbol.

After finding and selecting the eraser symbol, Sahba erases a small portion of the squiggly line and thereby demonstrates how to perform the specific action (line 1). Following a slight chuckle from Iris (line 2), Sahba produces the directive “remove with eh the fingers” and wipes 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 Sahba then shifts her gaze towards the screen with a puzzled face (line 5). As there is no immediate response from Iris, Sahba 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 explicated in this turn. Notably, beyond the additional verbal cues, Sahba also upgrades her embodied conduct by physically grabbing Iris’s hand and manually guiding it towards the screen rather than repeating the enacted swiping motion. In line 8, Sahba 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 Sahba pointed (line 9). After acknowledging Iris’s conduct (line 10), Sahba 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, 2016; Hydén & 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 reformulates 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”.

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


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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, swathes his finger across the slider and turns off the device. As a final remark, Emma holds the device accountable for not turning off, 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 carers 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 carers do to support and enable participation from people living with dementia, (ii) how the carers 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 carers do to support and enable the participants living with dementia in accomplishing ongoing joint projects? We argue that the directives produced by the carers, 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 solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts” (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. Gjernes and Måseide, 2015, 2020; Hydén, 2011, 2014) have applied the notion of scaffolding to dementia studies, elucidating the various interactional practices through which carers support the participation of people living with dementia in joint activities. As an example, Gjernes 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 visuoperceptual 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 Gjernes 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 Gjernes and Måseide (2020). Both involve joint activities 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 carers 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 teaching 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 incipient compliance (Craven & Potter, 2010; Kent, 2012), the participant living with dementia displays a commitment to completing the initiated joint project. Furthermore, the participants’ joint commitments to an ongoing activity also implies a mutual supportiveness. This means that when a participant has troubles fulfilling his/her contribution to the joint activity, the other is expected to offer assistance in repairing the trouble rather than taking over responsibility for the contribution (Bratman, 1992; Hydén, 2018). As Clark puts it “once you get into a joint activity, it is hard to take unilateral actions” (Clark, 2006, p. 140). Thus, by upgrading an initial directive following an insufficient response, the carers not only scaffold subsequent contributions, but in pursuing their accomplishment also acknowledge the agentic role of their interlocutors and treat the persons living with dementia as active co-participants (Majlesi, Ekström, & Hydén, 2022).

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 a clearly asymmetrical distribution of interactional labor within these dyads (Hydén, Majlesi & Ekström, 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. Hydén, Majlesi & Ekström, 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.

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Appendix A. Appendix

<table>
<thead>
<tr>
<th>Transcription Conventions</th>
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<tbody>
<tr>
<td>Square brackets mark overlapping speech or embodied conduct</td>
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<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>’word’ Degree signs surround quiet speech</td>
</tr>
<tr>
<td>word Underlining indicates emphasis</td>
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<tr>
<td>– A hyphen indicates cut-off</td>
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<tr>
<td>; Colon marks 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>
<tr>
<td>&amp;word+ &amp; word+ 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>—&gt;–&gt; &amp; Gesture or action described continues across subsequent lines until the symbol of said participant is reached</td>
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References