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Observing social connectedness in a digital dance program for older adults: an EMCA approach

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Abstract.
Sustainable societies require healthy populations that are inclusive of all ages in meaningful social engagement. Given the digital nature of contemporary social life, there is substantial interest in how older adults interact with information communication technology (ICT) and new media. For ageing rural populations, ICT is considered opportune to address increasing social isolation and loneliness by connecting older people in digital society. Understanding how older adults experience and achieve social connectedness through ICT is important to inform the development of programs and services designed for their meaningful engagement in social activities. More data is needed, particularly for people living with cognitive challenges, and in rural areas. But there are methodological challenges for this type of research involving this demographic. People living with dementia, for example, may depend on third party support to participate in programs and to articulate experience using verbal language. This paper introduces an international expansion of a study "Improving social inclusion for Canadians with dementia and their carers through Sharing Dance," [1] a digitally-delivered dance program. The expansion study will examine the impact of the program for social connectedness in an international context, using similar data collection methods to the Canadian study, while adding an additional layer of analysis using ethnomethodology and conversation analysis (EM/CA). This paper will both share findings from the Canadian study and introduce the conceptualization of the international study that builds on its foundation. A sample EM/CA analysis is provided, illustrating observable behaviour for comparison in different contexts, reducing dependence upon verbal language.

Keywords: Aging, Social Connectedness, Digital, Dance.

1 Introduction

Assistive technology to enable an ageing population to age in place is developing rapidly [2] while at the same time institutions are adopting information communication technology (ICT) approaches in a general "mediatization" of services and programs [3]. People, along with technologies of different generations adapt and develop as they increasingly interact through digital connections and pathways [4]. If older people are not participating in the development of digital technology in everyday interaction, how effectively can that digital technology be used to address their social exclusion? ICT is often touted as a solution to the problem of connecting older adults in rural areas to services and programs, but often using a top-down, interventionist approach. Focusing on social connectedness, ICT may be used to enhance older adult social connectedness according to their preferences for meaningful engagement at interpersonal, community, and societal levels [5]. For many older people and people living with dementia, access to digital resources for basic services and programs requires assistance from informal and formal caregivers and facilitators. Meanwhile, isolated individuals face decline in health and meaningful participation in society with no access to digital supports or their development, a phenomenon made more apparent during the COVID-19 Pandemic.

Understanding digital social connectedness for older adults via their participation in its development will, from a social sciences perspective, serve to critically inform and evaluate the effectiveness of digital programs designed to address the social inclusion of an ageing population, with implications for an entire network of formal and informal health, economy, care, and support at local, national, and global levels. The Sharing Dance Seniors program has demonstrated its potential to enhance older adult social inclusion, including people living with dementia through embodied expression [6] but how it is delivered remotely via ICT mediates its effectiveness by either enhancing or creating barriers to social inclusion [7]. The thematic analysis of the CIHR study [8] provided a foundation for a deeper analysis, pointing to social interactions of various dynamics through digital means. Further study of the digital delivery of this program using an EM/CA analysis will help to identify and articulate more specific affordances and constraints [9] for older people to meaningfully participate in and potentially reconstruct conditions to make sense of and contribute to the digital sphere.

Understanding social connectedness for older adults in digital contexts will critically inform the evaluation of such programs designed to address social inclusion for an ageing population [10]. Building on a previous study, "Improving social inclusion for Canadians with dementia and their carers through Sharing Dance" [1], this paper introduces a new study to systematically examine the social connectedness of older adults living with dementia, through their interactions in a digitally delivered dance program, Sharing Dance Seniors. Specifically, comparisons will be drawn between the program's digital mode of delivery to experiences of in-person dance instruction. Using an ethnomethodology and conversation analysis (EM/CA) approach, digital vs. in-person interactions will be compared in observations of older adults living with dementia in online vs. in-person dance instruction. Data will be

collected through participant observation and video ethnography. Video recordings of the dance sessions will be analyzed using EM/CA to compare digital vs. in-person interactions of participants and draw comparisons between international contexts. Understanding how older people living with dementia interact in digital vs. in-person settings will provide insights into the affordances and constraints involved in providing digital services and programs across borders, along with a deeper understanding of impact. This will contribute to best practices and policy guidelines for digital program and service delivery and provide opportunities for older people and people living with dementia to contribute to technology development.

This paper introduces the international extension of the study "Improving social inclusion for Canadians with dementia and their carers through Sharing Dance" [1]. First, the Canadian study will be presented including a description of the Sharing Dance program; research methods; and findings related to digitally mediated social connectedness, with a discussion on limitations of the qualitative methods. This will lead to the introduction of the international extension project with proposed research questions and a sample of the proposed EM/CA method.

2 International Expansion Research Design

2.1 The Canadian study: Improving social inclusion for Canadians with Dementia and their carers through Sharing Dance

The Improving Social Inclusion for Canadians with Dementia and Carers through Sharing Dance [1] study evaluated a specialized dance program for older people created by Canada's National Ballet School (NBS) in partnership with Baycrest Health Sciences, in its expansion through remote delivery from an urban centre to remote and rural areas across Canada. The four-year study (2017-2021) involved two regional pilot studies of three phases each in non-metropolitan regions of two Canadian provinces, Peterborough, Ontario (seven sites), and Brandon (Westman), Manitoba (six sites).

About the Baycrest NBS Sharing Dance Seniors program. Sharing Dance Seniors aims to make dance accessible to older people with a range of physical and cognitive abilities, including people living with dementia. Developed by Canada's National Ballet School (NBS) and Baycrest Health Sciences, the program is offered in terms (e.g., Fall, Winter, Spring). Terms are designed to build weekly from class to class. Each dance within a class includes physical and artistic goals such as physical awareness and mobility; coordination; strength; confidence; eye focus; storytelling through movement and gesture; joy; and engagement with music. The program was developed and is delivered in-person but also has a suite of remotely-led (through video streaming) dance sessions available for participants in institutional and community settings with on-site facilitators supporting participants. The program was piloted for nation-wide expansion under the Public Health Agency of Canada's Multi-

Sectoral Partnerships to Promote Healthy Living and Prevent Chronic Disease approach, in collaboration with long-term (residential) care homes, regional home-care providers, and community support agencies. During the study, the Sharing Dance Seniors program was delivered digitally (via live-stream video, pre-recorded videos for download, or pre-recorded video stream) and in-person during special events. Sharing Dance Seniors is produced as a weekly video series for streaming to multiple remote settings from a studio at NBS in Toronto, Ontario. Facilitators are identified locally for each site (in both community and institutional settings) and are integral to the digital delivery of the program. The facilitator welcomes and organizes participants; participates in and models the program for participants; monitors safety of participants and encourages interactions; and collects and provides feedback to NBS after sessions via an online form. Program orientation and training was provided for facilitators via online course modules through NBS' online learning platform.

Data Collection. With ethics approval from Trent University in Peterborough, Ontario, and Brandon University in Brandon, Manitoba, data was collected through observations, interviews, focus groups, diaries, and researcher reflections. Observations focused on participants' experiences of social inclusion at weekly sessions in each pilot at every site, recorded in writing in a semi-structured guide that developed over the two-year period. Researchers were encouraged to participate during the sessions, to enhance participation in the program and to help participants feel less 'observed'. Data collected through observations included descriptions of settings and participants; details of activity sequences and interactions; gestures, facial expressions, and reactions to other participants and on-screen instructors. Some sites provided informed consent for video to be recorded for later analysis to supplement in-situ field notes. All participants were given the option of keeping a diary of their experiences of the program to complete after each dance session through a semi-structured questionnaire in a provided journal or tablet to record their experiences. Data collected through diaries was limited in many cases due to the need for third-party support in completing entries. Focus groups were held with participants, their carers, facilitators, administrators, staff, and volunteers at the end of the eight-week sessions for each site in each pilot and data collected was to provide deeper insights for use in and analysis of interviews. Semi-structured interviews were conducted with interested participants, carers, facilitators, administrators, staff, and volunteers upon completion of the eight-week sessions. Interviews conducted prior to and after program sessions provided insights into participants' characteristics and attitudes towards dance as well as personal reflections into their experiences of the dance program. For some participants living with dementia, post-session interviews were deemed inappropriate due to limited memory of participation in the dance program and these were discontinued to avoid potentially stressful situations for these participants [1].

Research Participants. Research participants were originally recruited in partnership with community organizations, Community Care in Peterborough, Ontario, for the three phases of Peterborough pilots (P1, P2, P3), and the Alzheimer Society of

Canada Westman Region office in Brandon, Manitoba, for the Brandon pilots (B1, B2, B3). The Sharing Dance Seniors pilot program and research project was also advertised in both regions using local radio and newspaper channels along with word of mouth and referrals by the partner agency support groups. As the pilot studies expanded, returning participants recommended the program to others who joined sessions in the community settings. In institutional settings, recreation directors promoted the program internally to wider audiences and purposively selected participants based on whom they thought would be ideal participants, including persons living with dementia and their carers. Information sessions were held at each site and open to residents' families and local community members. There were 23 participants in P1, 54 in P2, 40 in P3 (including eight people living with dementia), 16 in B1 (including seven people living with dementia), 36 in B2 (including 15 people living with dementia), and 140 in B3 (including 68 people living with dementia), for a total of 289 participants in the three phases in both regions. Research participants included older adult participants between the ages of 66 and 96; persons living with dementia; administrators and staff in both community and institutional settings; facilitators; volunteers; and carers.

Data Analysis. The qualitative data analysis began with an initial round of inductive thematic analysis [6] identifying emerging thematic codes through detailed analysis using Nvivo software. As data collection progressed, the research team reflected on the evolving thematic code book to resolve coding differences between investigators, and examined new and emerging codes with each pilot. To be attentive to different dimensions of social inclusion within the data [11], conceptualization of social exclusion was incorporated into the coding to look for themes of potential exclusion or inclusion related to financial resources; social connections and resources; services; transport and mobility; safety; macro-economic; place & community; individual capacity; life-course trajectories. These themes, along with other themes generated from analysis of the pilots, were organized by the three research objectives of the original Canadian research project which were: to explore older persons' experiences; to assess program delivery effectiveness; and to identify the challenges of scaling up the program [1].

Findings. The following qualitative findings from the original study will demonstrate how people living with dementia received support from carers in participating in the program. During the second half of the study, there was a shift of setting from the community centre to institutional personal care homes, and participants included more people living with dementia. In response to local feedback in this context, the research team invited caregivers to attend, explained by a community administrator below:

> I think more caregivers should be encouraged to attend the session – I think it would pull families closer together because the people I talk to – they're lost. They'll say their family member or their friend – they

> say “I don’t know what to do with them” but if they come together it might be that cohesiveness that they need. (Community Centre Administrator, B2).

Staff and volunteers were also added at some sites, that created a network of people around participants to support their meaningful participation in the program. One carer described the effect.

> I was really impressed at how the [staff and volunteers] had assisted the residents and how positive reinforcement allowed them to engage and enjoy movement which is obviously going to be promoting good stimulation. I was really quite impressed when everybody had a partner that was kind of positively motivated. It was fabulous. (B3, Neepawa Carer)

One volunteer shared how surprised she was that participants in the institutional setting, people living with dementia participated even though the on-screen instructor (OSI) was not in the room. They also indicated that participants required assistance with instructions.

> You could see that they were trying – listening - and they were doing it. When [the OSI] would say [to] put their arms on the arms of the chair or their seat and they would do that - they were listening and they were doing it. That surprised me. And [the instructor is] not even in the room. … Sometimes it seemed that they would do [the dance] but they needed more cuing or more instructions (Volunteer, Interview Transcript, Institutional Setting, B2).

One example of this was E, who would often follow the screen movements, but needed reminding to focus on the screen.

> E almost misses the start of the music, but [staff] cues her to look at the screen, so she turns and catches on immediately to following the opening moves of the sequence, her wrists turning for the snail movements demonstrated by the OSI (Field Notes, Institutional Setting, B2).

Screen focus was one of the challenges of the digital delivery for many participants [5] and they would often look to others for cues of what to do, rather than the screen. One volunteer reflected in a diary that, “It would seem that when others in the group commenced the dance movements, participants would then look at other participants to follow the instructed movements (Volunteer, Diary Transcript, B2).

The series of quotes in the qualitative data above draw a picture of how participants, particularly people living with dementia were in some cases dependent upon third-party support to participate in the digitally-delivered instruction of the

Sharing Dance Seniors program. Further, their experience of the effectiveness of the digital delivery of the program was articulated by third parties, such as in the quote below:

> I was curious to see, to tell you the truth if, how they would respond via television, because I do exercise programs regularly – I was curious to see how technology would play a part – I thought it was great – I thought that some really latched on to the fact that it was via tv, but some still watched me – think there was a good mix of that– lots were on me because that's something they look for regularly, they're looking at me regularly - but a great combination because they had the music as well right – it was powerful in that sense because they got it all.

The understanding of how people living with dementia are responsive to the digital delivery of programs like Sharing Dance Seniors is limited to the subjective interpretation of carers and volunteers of their familiar interaction. This presents a limitation in the data to speak to the effectiveness of the digital delivery of the program from the perspective of some participants. For example, one institutional carer described a moment that she did not enjoy when it seemed that the resident she was supporting was not enjoying herself.

> I think there was maybe one time – I felt like I was sitting beside the one lady who didn't seem to be enjoying the program. I was trying really hard to make it better when she seemed to become agitated. I had to remind myself that she was enjoying it in her own way … (Staff Interview Transcript, B2).

A volunteer also described how they were unsure of how best to support participants:

> As a volunteer, we were the ones they could see what we were doing if they couldn't get all the instructions we could help. I didn't know how much we were meant to help them –you know we just let them do things and obviously they would look at us, but sometime you know – with Jim – I would help him uncross his legs and say, "your legs" or you know get their arm and move it, so if I wasn't supposed to do that I imagine someone would stop me. Sometimes it seemed that they would do it but they needed more cuing or more instructions. Some of them could really do with more with one-on-one.

In each of the described scenarios above, carers who were present during the program to support participants were focused on providing the necessary cues for them to participate and were unsure of their interpretation of what they were supposed to be doing. One the one hand, the staff member articulated that she had to allow the

participant to experience the program in their own way, while the volunteer felt that the participant needed more cuing and instructions.

Discussion. Uncertainty of the volunteers in knowing how best to support participants indicates a need for greater understanding of how to read different participants' level of participation or how well they are connecting to each other in interactions for the intended purpose of the program, to enhance social inclusion.

The next section of this paper introduces a new study to address this methodological challenge of reading levels of interaction by expanding on the analysis in the methods to use EM/CA as a tool to observe interactions and compare them in different contexts.

2.2 International Expansion

Building on this work that used a qualitative, thematic analysis with implications for social inclusion, the unique contribution of this proposed project will be in the international expansion of the program evaluation, with a more detailed analysis of social interactions in digital vs. in-person contexts using EM/CA research tools. To articulate observable social connectedness for people living with dementia using ICT, this analysis will focus on detailed observations of older adults and people living with dementia in social interactions through the digital dance program. EM/CA will provide the theoretical framework and method for data collection and analysis to study older adult social connectedness. The assumption is that older peoples' and their carers' everyday methods create order in their joint social activities, which has implications for older peoples' experiences of social connectedness. Emphasis will be placed on observable behavioral aspects of human experience, rather than introspection as its primary mode of inquiry [12]. Objectives of the research are: 1) To contribute to understanding of digital social connectedness for older people, including older people from rural areas and people living with dementia, through remotely-delivered dance instruction; iii) To critically assess the effectiveness of digital delivery for social connectedness of people living with dementia.

Ethics. Informed consent will include anonymity of subjects and obtained well in advance of the program due to the need for third-party consent of older participants in institutional settings. Sensitivity to the inclusion of persons living with dementia (PWD) will require ongoing verbal consent and appropriate inclusion in methods such as interviews and focus groups in consultation with carers. (i.e. we found previously that interviews caused anxiety for PWD to remember participating in the program for some who did not recall it.) If in-person delivery is not possible (due to COVID-19), permission is granted to access data from the CIHR study within the parameters of the original ethics agreement that will allow analysis of data from the previously completed study.

Data Collection. Participants will be recruited through outreach to personal care settings and community-centre/dementia-care administrators in a purposive sampling of older adults aged 75 and up, including persons living with dementia. Data will be collected through video recordings of eight weekly dance sessions. In the home delivery of the program, 5 individuals will be observed during 8 weeks of 25 minute-sessions (40 x 25 = 1000 minutes of recorded video); in institutional settings, 3 groups will be observed over 8 weeks (1 digital international, 1 in-person, 1 mixed digital/in-person delivery) (24 x 45 = 1080 minutes); (group maximum of 10 people including participants, (5) carer, volunteer and staff facilitators (5)). A total of approximately 35 hours of video recordings will take approximately 105 hours in which to view, select and analyze. In week seven for group settings, a focus group will be conducted (digitally or in-person) with questions about their experiences and to seek contributions of their own gestures to incorporate in the final 8th session). Field notes will be conducted to provide context, (est 60 days @ 1-2 pages) Short interviews will be conducted after weekly sessions with selected individual participants in both home and institutional settings (approximately 5 minutes weekly with 5 individuals = 30 interviews for a total of 150 minutes of transcripts).

EMCA Analysis. Using EM/CA will enhance the qualitative methods used in the CIHR study that provided reflective accounts of participants and their carers (including family, staff, community volunteers). Conversation analysis of data collected through video recordings and observations in the previous Canadian study will also be possible through articulated data sharing agreements in accordance with ethics guidelines and approvals governed by Canada's Tri-Council Policy Statement. The following sample of EMCA analysis conducted on existing data from the previous project demonstrates the potential for observable participant connectedness in response to the digital delivery of the program.

Sample EM/CA Analysis: Dancing her way. The following excerpt has been adapted from a field note for the purpose of this paper. It demonstrates an interaction between two older adults living with dementia (L and D), in a dance class that is delivered digitally via and on-screen instructor (OSI) to the group they are part of. The focus is on the interaction between L and D who are meant to follow along with the OSI as they call out and demonstrate movements such as kicking their legs in time with the music. In this example, L expresses concern that D is not participating in the dance class by shaking a fist at D (see Line 04), while D deviates from the instruction and follows only the final kick.

01. OSI: So we're going to kick our one leg straight out as far as comfortable,

02. L: [((L kicks legs out, Looks over at D who does not move, D is looking at L.))

03. OSI: So that might be on the floor or just off the floor, I'm going to take it off the floor (.) so I'm going, (.) Out, (.) In, (.) Out. (.) In, (.05) Kick, (.) and kick.

04. [((L shakes a fist at D, who looks away, D lifts chin up high briefly then lets head relax and turns face away from L and looks ahead.))]

05. OSI: So there we have our legs and our arms and then we're going to put them all together.

06. OSI: [((Motions to piano player))

07. OSI: Thanks

((Music Starts, L watches D, neither move))

12. OSI: Out in, Here come the legs, Kick. (.) In. (.) Out, (.05) Out, (.05) In. (.) >Really kick=Out.<

15.→D: [((D kicks one leg out in a high kick and then lowers leg. Lifts chin)).

16.→ L: [((L watches this with mouth open in amazement expression and smiles))

18. OSI: And we're going to pause at the end of this phrase

((Music stops))

Discussion. What is interesting about this excerpt is that at first glance it seems as though D is not participating in the program because they are not following the dance as instructed by the OSI (line 02). D watches L as the OSI explains the moves for the next dance sequence. L, who is following the moves, responds to D's lack of movement by shaking a fist at D (a gesture of communication that is individual to L), (line 04), to which D responds by turning away and looking forward. Once the music begins, D does not move until the final kick, on the OSI cue and does one large kick (line 15) and then stops as L watches with a look that expresses amazement (line 16). There is a performativity about D's interaction with L that denotes a flourish in creativity and self-expression, rather than non-participation, as had been described by a carer in the qualitative findings of the previous study. D's semi-compliance with the

instruction on D's own terms indicates a strengthening of deontic status [13] that problematizes the nature of simply following instruction for some participants. This case illustrates the complexity of facilitating social connectedness remotely, as participants need to negotiate their sense of self and agency. This sample of EMCA demonstrates how providing the opportunity to connect remotely through a common goal to participate is simply a starting point. Facilitators and carers providing support for participants also need to be sensitive to individuals' sense of agentic acquiescence.

3. Conclusion

This paper introduced the international extension of the study "Improving social inclusion for Canadians with dementia and their carers through Sharing Dance" [1]. We presented findings from the Canadian study that demonstrated how people living with dementia received support from carers to participate in the digitally delivered dance program. The data revealed a need for greater understanding of participants' level of participation and connectedness to other participants, to inform carer practices of support. The understanding of how people living with dementia were responsive to the digital delivery of Sharing Dance Seniors was limited to the subjective interpretation of carers and volunteers. A deeper analysis of the interactions of participants in different contexts may speak to the effectiveness of the digital delivery of the program.

We then introduced the international extension project with research objectives that focus on understanding digital social connectedness through remotely-delivered dance instruction; and to critically assess the effectiveness of digital delivery for social connectedness of people living with dementia, along with a sample of the proposed EM/CA method using previously collected data.

The international study proposes to address the methodological challenge of reading levels of interaction by expanding on the analysis in the methods to use EM/CA as a tool to observe interactions and to compare them in different contexts (in-person vs. digital, international, etc.).

Using EM/CA analysis to make explicit the factors that influence older adult social connectedness in digital settings will contribute to multidisciplinary calls for measuring effectiveness of ICT for social connectedness [14]; social health and social participation [15]; effectiveness research in quality and evidence of acceptance of ICT [16]; with better methodological quality [17]; with minimal risk of bias [18]; and in groups such as in people with cognitive impairments, and people living in rural areas [19]. Data will include observations and reflections of older people and people living with dementia as co-creators of knowledge and relevant contributors to social research in a participatory approach in the assessment and influence of digital technology design for social inclusion/connectedness and further, facilitate the use of such evidence in monitoring and evaluation.

EM/CA uses video as its basis for analysis. Ethnography employing in-person field notes and interviews with participants may enrich the video observations for

understanding how people living with dementia interact with digital programs and their co-participants. EM/CA will provide a sensitive method to address how people articulate understandings and emotions as we observe their behaviour in situations and environments that influence their interactions in relation to digital technology. Comparisons drawn between in-person and digital delivery of dance interactions may allow affordances and constraints for digital social connectedness to be observed. Participants will be observed as they interact with instructors and others around and through digital technology in activities designed to encourage interactions through movement and dance. An in-depth study of the program's delivery modes, particularly the mediated interaction of the digital delivery in comparison to its in-person delivery using an EM/CA approach will theoretically allow the affordances and constraints that influence interactions to emerge [9]. Identifying details in interactions and their role in social connectedness may contribute to our understanding of how to best support interaction for social inclusion in multiple contexts and raise discussion about the limits of observability and measurability of human connectedness. This project will emphasize the important contributions that older people and people living with dementia make to the development of effective ICT-delivered programs.

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