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An Intersectional Lifecourse Lens and Participatory Methods as the Foundations for Co-Designing with and for Minoritised Older Adults

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The design of digital technologies for older adults is often premised on deficit models of ageing that position older people as a homogenous group and as passive users of technology, with an overwhelming focus on meeting practical needs in older age. In response, a growing number of scholars in HCI and Science and Technology Studies (STS) are engaging with processes of co-design that situate older adults as experts in their own lives and as central to the design process. These scholars highlight how an essential first phase of co-design is understanding and foregrounding the lifeworlds, experiences and expertise of older adults. This paper responds to these calls, alongside the lack of consideration of minoritised older adults in co-design. It draws on the empirical findings from the first phase of the Connecting Through Culture As We Age project, which places twenty minoritised older adults who identify as disabled, and/or racially and/or socio-economically minoritised, at the centre of a digital innovation process. Through a case study approach, we focus on two of the minoritised older adults involved, to demonstrate the value of bringing together participatory methods with an interdisciplinary lifecourse lens. We highlight the power of this approach for understanding minoritised older adults' relationships with technology, as shaped by experiences across the lifecourse, for building relationships, and ensuring their agency and voice underpin the co-design process.

CCS Concepts: Human-centred Computing → Embedded systems → Collaborative and social computing Collaborative and social computing design and evaluation methods → Ethnographic studies

KEYWORDS: Digital cultural experiences, intersectional lifecourse, creative methods, participatory methods, older adults, minoritised older adults

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1 INTRODUCTION

Digital technology design for older adults is often grounded in deficit models of ageing that view older people as a homogenous group and as passive users of technology, with technology offering a means or solution to address practical needs in older age (Pena et al. 2021). Efforts to encourage the participation of older adults in digital worlds have been framed around the problems of old age, with technology instrumentalised as a solution (Gallistl et al. 2020; Neves and Mead 2021; Neves, Waycott, and Malta 2018). These deficit-based, interventionist approaches have been a common feature of HCI projects (Vines et al. 2015) and have contributed to a disconnect between the design of technologies and the everyday lives (or 'life-worlds') of older adults, particularly those who are minoritised (Cozza, Östlund, and Peine 2020; Peine and Neven 2019, 2021). In response, a growing number of scholars in HCI and Science and Technology Studies (STS) are engaging with processes of co-design that situate older adults as experts within their own lives and as central to the design process. This encompasses the use of interdisciplinary methods that centre collaborative approaches within the context of older adults' everyday and historical lives (Gallistl et al. 2020; Manchester and Jarke 2022). As part of this, researchers are encouraged to "reflect upon how their [older adults'] personal histories impact upon technology use now and in the future" (Vines et al. 2015, pp. 19), foreground methods that enable in-depth understanding of their lifeworlds, and support their participation and inclusion (Pena et al. 2021).

This paper focuses on laying the foundations for co-design by outlining how the Connecting Through Culture As We Age project adopted an intersectional lifecourse lens and participatory methods. In doing so it responds to calls in the field for deeper understandings of older adults' histories, lived experiences and sociomaterial lives in order to develop design methods and technologies that offer greater value to their lives (Peine and Neven 2019; Pena et al. 2021). Our argument builds on others who have argued for more asset-based approaches to designing technologies for, and in collaboration with, older adults (Östlund et al. 2022a; Vines et al. 2015). The paper draws on empirical findings from the Connecting Through Culture project, a 3-year co-produced research project that began in 2021. The project is funded by the UK Research and Innovation Healthy Ageing Challenge programme, and is led by the third author of this paper, Helen Manchester. The project explores how participation in arts and culture, particularly digital forms of participation, can influence our wellbeing and feelings of social connection as we age. It puts the voices and expertise of twenty older adults (aged 60-75), who identify as disabled, and/or socioeconomically and/or racially minoritised, at the centre of a digital innovation process. The older adults collaborate with artists, designers, digital technologists and community organisations to co-design digital cultural experiences that support social connection and wellbeing in later life.

The paper draws on findings from the first fourteen months of the project, referred to as the 'foundational stage' or the 'fuzzy front end' of the co-design process (Sanders and Stappers 2008). In this period, we spent time building relationships with the older adults, drawing on participatory methods to co-generate knowledge about the significance of culture, creativity, social connection and digital participation in their lives, and introduce them to digital design processes (see fig. 1, project timeline). These activities laid the foundations for the latter stage of the co-design process, in which the older adults participated in the design of six prototyping projects.

Our rationale for focusing on the foundational stages of the project is two-fold. First, it allows us to illustrate how an intersectional life course lens and participatory methods enabled us to put the lifeworlds, lived experiences and agency of the minoritised older adults at the forefront of the co-design process. We recognise this as vital if we are to involve minoritised older adults, a group that is rarely the focus of CSCW research, in processes of co-design that generate more applicable and useful technological designs. Second, if CSCW scholars are to start engaging with older and minoritised communities, we must discuss how best to design relational methodological practices that build trust and mutual respect. This is critical not only at the beginning, but also throughout a co-design project, to ensure their ongoing inclusion and participation (Bischof and Jarke 2021).

The paper begins with an exploration of interdisciplinary work that outlines the mismatch between digital design and the lifeworlds of older adults, particularly those who are minoritised. Next, we describe what participation means within co-design processes, before outlining the value of an intersectional lifecourse approach that enables us to better understand the lives of older adults and to facilitate their participation. We pay special attention to how this approach can develop an understanding of a person's experience in a particular moment of their life whilst attending to how it has been shaped and influenced by prior experiences that unfold across the lifecourse. We move on to describe the Connecting Through Culture As We Age project and outline the participatory methods that we have used as a foundation for co-design.

The findings of this paper offer case studies that provide an in-depth focus on two of the older adults involved, who we refer to as 'co-researchers' rather than participants, in recognition of the significant role they played in the co-production of knowledge during the foundational stages of the project. The focus on a small number of case studies reflects the argument at the centre of this paper; the need for more in-depth engagement with the lifeworlds and personal histories of older adults in the HCI field. The case studies and discussion address the following research questions:

RQ1. What can an intersectional lifecourse lens help us to understand about minoritised older adults' relationships with technology?

RQ2. How can participatory methods illuminate experiences across the lifecourse that might enhance the co-design of technologies?

Finally, referencing the literature base, we close the paper by critically reflecting on the implications of our methods and intersectional lifecourse lens for co-design approaches with minoritised older adults in the CSCW field, and the future direction of the Connecting Through Culture project.

2 BACKGROUND & RELATED WORK

2.1 What we've learned from deficit-based design approaches with older adults

In advanced capitalist economies the influence of market forces has led to the mass production of generalisable technologies that lack sensitivity to diversity within their designs (Bannon 1995; Cozza, Östlund, et al. 2020; Peine and Neven 2021). The sites of design are too often far removed from users being located in laboratories, design studios, and industry meeting rooms, rather than developed in their environments of use. Design teams are also often constrained by institutionalised timescales, resources and regulations (Peine and Neven 2021). Thus, as the basis for decisions, designers have historically relied heavily on generalised representations of users' lives and everyday experiences, described as 'scripts' (Akrich 1995; Neven 2010; Wanka and Gallistl 2021). These scripts attempt to configure the user by enabling and constraining their interactions with technology (Bischof and Jarke 2021), reflecting the designer's beliefs about who the user is and how they should behave (Akrich 1995; Neven 2010). In technologies designed for older adults, ageist scripts inscribe prevailing narratives around ageing into design, which, in turn work to: cement age-related representations within societal discourse, influence older adults' lives and identities, and shape future design (Bischof and Jarke 2021). These ageist scripts can perpetuate the discrimination of older people (Neven 2010; Wanka and Gallistl 2021).

In reaction to this, driven by the HCI community, there have been many attempts to involve older adults in the design of technologies through collaborative processes (Östlund et al. 2022a; Vines et al. 2015; Waycott and Vines 2019b). This is motivated by the idea that it allows us to better anticipate the use of technology in their lifeworlds (Ehn 2008) and generate more adoptable technologies (Jaz et al. 2019.). Here, older adults are situated as experts in their own lifeworlds and best placed to participate in the design of technologies to be adopted within them (Östlund et al. 2022a). However, collaborative design processes have been dogged by the dominance of deficit-focused representations of ageing (Light, Leong, and Robertson 2015; Righi, Sayago, and Blat 2017) that frame design activities with older adults around negative attitudinal, functional, and physical relationships with technology (Neves and Vetere 2019; Vines et al. 2015). For instance, that older adults do not like, cannot use, or are late adopters of technology (Peine, van Cooten, and Neven 2017). The focus of technological innovation for 'healthy ageing' stresses "disability prevention and maintenance of independence" (Cozza, Östlund, et al. 2020, pp. 2), while delegating "to (older) people the responsibility to function at a higher level, even when that is difficult or not desired" (ibid, pp. 6). Such design involves the simplification of phenomena to create static well defined problem spaces ripe for the instrumentalisation of technology (Oudshoorn, Rommes, and Stienstra 2004) to placate negative age-related phenomena (Jarke 2021; Peine and Neven 2019; Schwennesen 2021) with a set of specified functions and features (Oudshoorn et al. 2004). Hence, design agendas for older adults' technologies have often centred around addressing health issues and social isolation (e.g., Oh, Oh, and Ju 2020) through biomedical technologies (Katz 1996; Manchester and Jarke 2022; Vines et al. 2015) to assist physiological (e.g., Gaugler et al. 2019) and psychological deficits (Barnard et al. 2013; Neves, Amaro, and Fonseca 2013; Neves and Vetere 2019; Özsungur 2022; Tsai et al. 2015).

Such approaches fail to represent the rich and messy realities of the lives of older adults and the diverse range of identities, literacies and experiences that mediate lives and relationships with technology as we age (Pena et al. 2021; Wanka and Gallistl 2021). This is particularly true for minoritised older adults, whereby "outdated attitudes towards 'non-typical' people (a problematic notion at its core) remain within the design process", with a "tendency to consider these groups as subsets of populations" (McGinley et al. 2022, pp. 542). Older minoritised adults experience a wide range of structural inequalities that play out in diverse ways in their everyday lives (McGinley et al. 2022; Robinson et al. 2020). Meanwhile, deficit driven design (both design processes and the technologies they produce) risks reducing individuals to the barriers they face rather than celebrating what they have to offer (McGinley et al. 2022; Rogers et al. 2014) and what they contribute to their communities (Neves and Vetere 2019; Waycott and Vines 2019b).

In response, greater depth of engagement with the complex lifeworlds and personal histories of older adults (including how they are shaped by wider social, political, cultural and economic forces) as the foundation for design innovation has been advised(Östlund et al. 2022a; Peine and Neven 2021; Pena et al. 2021). Light (Light et al. 2015) reconceptualised ageing as a 'process' that affects us all in different ways (both good and bad and at varying rates of change), where our capacities and priorities change, rather than as a condition experienced uniformly by everyone of a certain chronological age (Light et al. 2015). Older adults are instead, "ordinary members of (multiple) communities, wherein they interact with other (younger, peer and older) members for a wide range of purposes, and shape their own identity" (Righi et al. 2017, pp. 16). Technologies and the processes of their design would better serve older adults by affording them opportunities to enrich and empower their lives rather than spotlighting perceived deficits (Light et al. 2015; McGinley et al. 2022)(Carstairs and Keon W.J 2008; Gaver n.d.; Gaver, Dunne, and Pacenti 1999; Light et al. 2015). To do this, some advocate for leveraging creative and participatory methods; opportunities for older adults to exhibit the skills and experience that come from lifelong learning (Östlund et al. 2022b); and which afford them greater agency (Light et al. 2009; Light and Akama 2014).

2.2 Framing our asset-based approach to co-design with minoritised older adults

In order to represent these more nuanced and asset-based understandings of ageing in the design of technology, we must begin by generating richer pictures of individuals' lifeworlds (McGinley et al. 2022; Peine and Neven 2021). To situate the work described in this paper, we advocate for 'co-design', a contemporary participatory approach that emphasises 'collective creativity' (Sanders 2013). It brings together "designers that hold 'professional expertise' and people that are 'experts of experience' to collaborate throughout a design process" (McGinley et al. 2022, pp. 546) as equal partners (Sanders and Stappers 2008). Additionally, as we frame our approach, we are sensitive to our responsibilities to "critically engage with power relations in design practice" (Manchester and Jarke 2022, pp. 184), and support the agency and participation of collaborators (Waycott and Vines 2019a, 2019b).

Some approaches to co-design have been criticised as being overly pragmatic or, at worst, extractive, by commodifying and instrumentalising co-design to prioritise the agendas of researchers and/or their institutions (Akama, Light, and Kamihira 2020; Cozza, Cusinato, and Philippopoulos-Mihalopoulos 2020; Jaz et al. 2019.). This is to the detriment of understanding and empowering those participating, as well as the inclusive, democratic and emancipatory traditions of participatory design (Cozza, Cusinato, et al. 2020; Grigorovich et al. 2022; Kyng 2010; Lim et al. 2016). In this project we understand the relationships between design participants, the technologies they use, and their engagement with design methods as underpinned by a complex network of sociomaterial entanglements across their lifecourses (Ehn 2008). Participation in design activities, described by Ehn as 'entangled cultural-material games' (Ehn 2008) are mediated by participants' experiences across their lifecourse and may bring about change in their daily and future lives (Light and Akama 2014; Peine and Neven 2019).

In keeping with Light and Akama (2014) we believe co-design should go beyond facilitating participation in 'design activities' and must consider the ethical implications of research and collaboration. We must aim to ensure that any resulting changes in participants' lives are valuable and sustainable. Light describes possible 'transformative impact' (Light and Akama 2014), quoting an older adult describing their co-design participation, "We went in as old people and came out as people with our own thoughts and agendas" (Light et al. 2009, pp. 45). They postulate the importance of considering how power, roles and social relations between designers and older adults can adapt and change during a design process as older co-designers grow in confidence and begin to experience agency (Light and Akama 2014). This focus on power in co-design is at the heart of Design Justice (e.g. (Costanza-Chock 2020)), another key influence on our co-design approach. In accordance with Design Justice, we aim to reconfigure mainstream design by centring the experiences, expertise and voices of older people who are directly affected by design processes and the artifacts, services or experiences produced. Central to this is positioning designers as facilitators rather than experts, honouring the different forms of localised and embodied knowledge older adults bring, and making a commitment to long lasting community-led and community-controlled outcomes (Costanza-Chock 2020).

In order to set conditions for co-design, Sanders and Stappers (2008, 2014) suggest the value of prefacing generative design activities with 'fuzzy front-ends'; pre-design activities that prioritise understanding the lifeworlds of participants and how to support their participation. In the context of our project, when undertaken with older adults and minoritised groups, this is a particularly "dense and important" aspect of co-design (Bischof and Jarke 2021, pp. 202), which we position as the foundational stages of co-design. These early stages help establish crucial foundations for co-design, such as building our understanding of anchoring elements within participants' lifeworlds (Binder, Brandt, and Gregory 2008), developing social connections and trust (Grigorovich et al. 2022; Sanders and Stappers 2008), supporting creative confidence, and establishing the resources needed to take part (Binder et al. 2008). Furthermore, any involvement, particularly in the case of minoritised groups, must be understood as situated within systems of structural inequality that shape their daily lives. Participation is predicated upon understanding these systems, how they affect everyday sociomaterial lives, and therefore what is needed to support minoritised older adults' participation (Grigorovich et al. 2022; Jarke 2021; Manchester and Jarke 2022; Wanka and Gallistl 2018).

2.3 An intersectional lifecourse approach as a theoretical lens to inform co-design

While many publications in HCI, working at the juncture of Ageing and Science and Technology Studies, have critiqued and theorised approaches to co-design with older adults, few have described how to connect theory with practice (Östlund et al. 2022a). Lifecourse approaches are gaining popularity as a theoretical lens for understanding older adults' relationships with technology (Foong 2016; Robinson et al. 2020; Sakaguchi-Tang et al. 2021; Vines et al. 2015). For example, Pena et al. (2021) highlight the value of lifecourse approaches for exploring how techno-historical contexts mediate perceptions, expectations and attitudes towards technology in later life (Pena et al. 2021).

Lifecourse approaches originally emerged in social history and demographic studies and have since been developed across the social sciences and psychology disciplines (Elder 2009; Barkhuus, Bales, and Cowan 2017; Liechty and Yarnal 2010), including social gerontology and geographies of ageing (Nash 2008.; Skinner, Cloutier, and Andrews 2015). Lifecourse approaches move away from linear and ordered understandings of people's lives, recognising instead how a person's experience in a particular moment of their life is shaped and influenced by prior experiences (Barron 2019). Exploring the relation between ageing and technology therefore necessitates understanding older adults' spatial, physical, embodied and emotional everyday encounters with technological devices and how this is shaped by one's personal history (Barron 2019)

Our lifecourse approach breaks from understanding ageing as a fixed biological reality, recognising it instead as a dynamic process that is socially and culturally constituted. It involves understanding how situated experiences of ageing at the level of the *individual* are shaped by the *historical, social and cultural* context in which people are embedded. In this sense it enables a bridging between the micro- and macro- levels of socio-structural analysis (Bengtson, Burgess, and Parrott 1997). Crucially, this understanding of ageing as processual, situated and socially constituted breaks from "static accounts of the 'life cycle' as a fixed and repetitive sequence of ages and stages within human life and experience." (Hockey and James 2003, pp. 6).

Given our research and the co-design process involves collaboration with *minoritised* older adults, we draw on lifecourse approaches that encompass an intersectional lens. Intersectionality emerged in opposition to monoism, the idea that single categories of social relations (age, gender, class, race, (dis)ability, sexuality, etc) can be independently analysed and understood (Goertz and Mazur 2008). At its heart, intersectional theory recognises that people embody multiple social identities, which intersect and are associated with differential power/resources, life chances, and lived experiences (Holman and Walker 2021). Intersectional theory in gerontological research has been used to explore identity and understand how intersecting systems of oppression including ageism, sexism, classism, racism, ableism and so forth, produce inequalities in ageing (Ferrer, Brotman, and Koehn 2022; Holman and Walker 2021). It enables an understanding of *how* age interacts with other markers of social difference to shape the ways in which life is encountered and lived in older age (Hopkins and Pain 2007).

Understanding an older person's relationship with technology through an intersectional lifecourse lens necessitates exploration of how intersecting identities shape experiences with technology and opportunities for building digital literacies across the lifecourse. For example, how an intersection of racialised and classed inequalities can detrimentally impact access to formal education and the labour market, which can limit opportunities for developing digital literacies, thus shaping engagements with technology in later life. However, it's important not to lose sight of agency – that people act individually and collectively to resist and challenge structural discrimination (Nash 2008.). For example, by acquiring digital literacies through alternative means, such as informal education that takes place in the family or community settings.

In the next section, we turn to discuss the participatory methods we developed in our work with minoritised older adults to better understand how relationships with technology in later life are shaped and mediated by the wider lifecourse.

3 PARTICIPATORY METHODS FOR UNDERSTANDING THE LIFECOURSE

Drawing on the breadth of our interdisciplinary knowledge, the research team[1] drew on four participatory methods that enabled collaborative exploration of co-researchers' everyday lives, including experiences of culture, connection, digital engagements, and their intersections. Our methods were informed by the Participatory Action Research (PAR) tradition and its grounding in the work of educator and philosopher, Paulo Freire (Freire 1996) . We were particularly inspired by those working at the intersections of PAR and co-design (Costanza-Chock 2020; Zamenopoulos and Alexiou 2018). Rather than positioning participants as passive objects of study, or 'end-users' in a design process, they play a central role as 'co-researchers' and 'co-designers' who hold ownership over the knowledge, ideas and artifacts produced across the research and design process (Pettican et al. 2023). In this section we provide background to the twenty co-researchers at the centre of this study, introduce our extended case study approach, outline the four participatory methods, our approach to analysis and ethical considerations.

3.1 Co-Researchers and recruitment

The twenty co-researchers (M=4, F=16) are aged 60-75 years of age, the majority of whom are from across the City of Bristol area and a small number from other parts of the country. The co-researchers self-identify as experiencing one or more form of minoritisation – socioeconomic, racial, and/or being disabled. There is extensive diversity amongst the group in terms of their creative interests, literacies, digital literacies, spoken languages, cultural backgrounds and abilities, with some co-researchers experiencing physical disabilities and/or cognitive and sensory impairments.

The co-researchers were recruited through the project's three community partner organisations: a disabled people's led charity, a Black-led racial justice organisation, and a community organisation based in an area of Bristol with high rates of socio-economic deprivation. Many co-researchers had longstanding connections to these organisations and drew on their services. Representatives of each organisation approached individuals to take part, and once they had identified interested participants, organised for a member of our research team to meet with them to provide an introduction to the project. The community partner organisations then played a key role throughout the project, supporting the continued inclusion and participation of co-researchers.

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[1] We are an interdisciplinary team of researchers with backgrounds in the social sciences, arts and human computer interaction.

3.2 An extended case study approach

This paper focuses on two cases studies, each relating to individual co-researchers, Miss Edwards and Pandora. These cases were selected through purposeful sampling, a common approach in qualitative research based on the selection of case studies that speak to the phenomena of interest, rather than striving for a random sample that represents a diverse population (Patton 1990). We felt Pandora and Miss Edwards would be of particular interest to the CSCW community because their relations to technology are shaped by a diverse intersection of lifecourse experiences and interests, alongside intersecting inequalities relating to digital exclusion, health, education, migration, housing, class, race and disability.

A case study approach offers an opportunity to enrich, widen and transform an audiences' understanding of a particular phenomenon, including an individual subject, and the context of their life (Hollweck 2015). We adopt an extended case study approach, which "enables the analyst to trace how events chain on to one another, and therefore how events are necessarily linked to one another through time" (Mitchell 2011, pp. 60). This in-depth focus on two co-researchers includes detailed analysis of how their relationships and engagements with digital technology are shaped by experiences and events across the lifecourse, and conditions of structural inequality. This is particularly important given that minoritised older adults are rarely independently studied in the CSCW field. Finally, the extended approach also provides space for reflection around the selection and adaptation of participatory methods in the context of each case.

We are not looking to produce generalisable research findings or present universalist claims about minoritised older adults' relationships with technology based on these two case studies. Feminist epistemology has long highlighted how the act of generalising leads to the erasure of difference and has historically resulted in essentialising claims about minoritised groups (Brooks and Nagy Hesse-Biber 2007). Rather, in our discussion we tentatively suggest the findings from the cases of Pandora and Miss Edwards offer applicability when understanding and co-designing with the other co-researchers, and therefore are more generally useful for those in the CSCW field, particularly for those who are interested in co-designing with older adults and/or minoritised groups.

3.3 Methods

In this section we outline the four participatory methods we adopted to work 1-2-1 and in group workshop settings with co-researchers. Our approach is an example of the "adaptation and adoption of established methods" (Wiles, Crow, and Pain 2011, pp. 601), including from participatory, creative and visual traditions (Blair and Minkler 2009; Kara 2015; Pfister, Vindrola-Padros, and Johnson 2014), alongside ethnographic approaches (Degnen, Twigg, and Martin 2015). The methods value 'participant generated data' (Pfister et al. 2014), aiming to elicit reflection and exploration of experiences through visual, performative, arts-based and written modes of communication (Kara 2015). Collectively, the methods enabled us to develop rich understandings of co-researchers' lifeworlds, including the intertwining of their social, cultural and technological engagements, and then contextualise this across significant lifecourse events, relationships and experiences. The methods also enabled the research team to build relationships of trust with individual co-researchers, as well as across the wider cohort of co-researchers, which was important prior to forming prototyping collaborations with artists, designers and creative technologists in the latter stages of the project work.

The methods included:

- My Album and diary activities (1-2-1 setting)
- Digital literacy sessions (1-2-1 setting)
- Creative digital workshops (group setting)
- Exploratory introduction to co-design workshops (group setting)

Fig.1. depicts a timeline of the project, locating each of the four methods within the first stage of the project, entitled “laying the foundations for co-design”. The methods used in 1-2-1 contexts (1 and 2) took place in a variety of locations, including local neighbourhood cafes, community spaces, green spaces, and often in co-researchers’ own homes once trust had been built. The group workshop methods (3 and 4) were run in community spaces, many of which were familiar to the co-researchers prior to joining our project.

Given the diversity across the cohort it was important not to impose a set of generalised methods, as this could risk alienating and excluding some co-researchers (Hendriks, Slegers, and Duysburgh 2015). Rather, we adopted a strengths-based approach, starting with the abilities and interests of each co-researcher and adapting the methods to tailor our work with them. The case studies in the analysis and discussion section focus on data collected through our adaptation of these methods in response to the two co-researcher’s interests, capabilities and the grounded context of their lives.

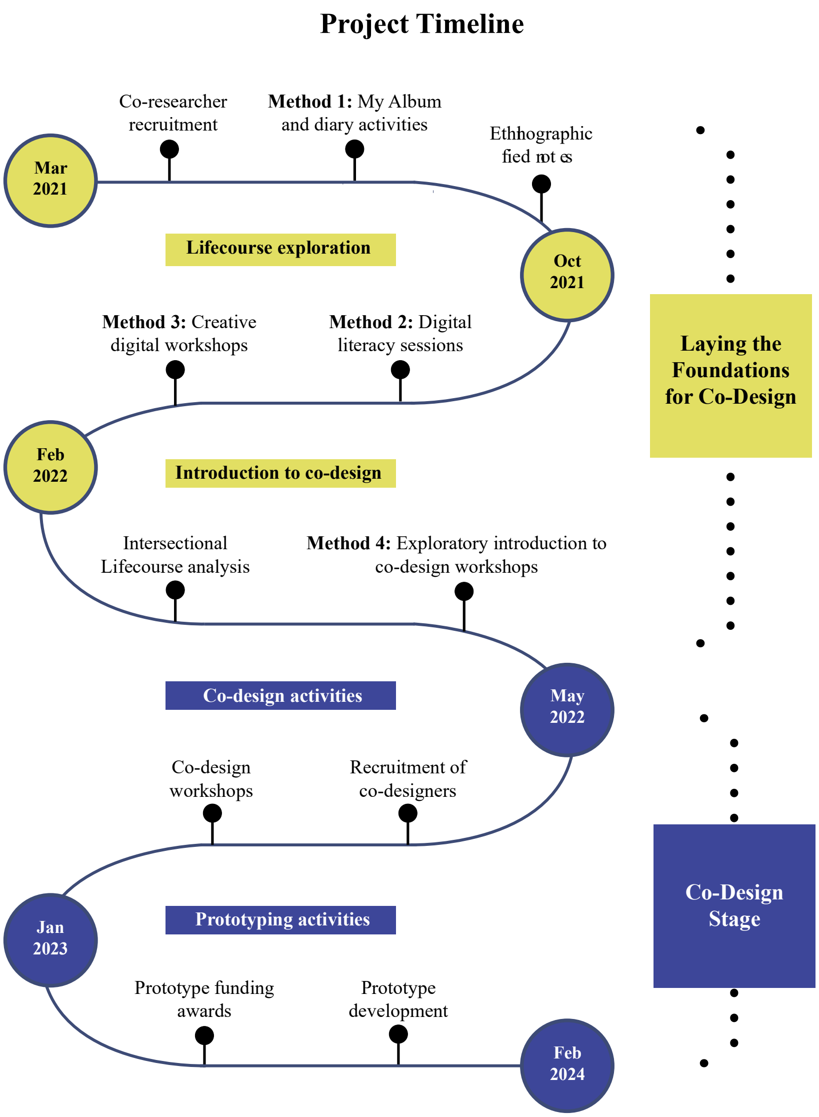
Project Timeline
Mar 2021
Co-researcher recruitment
Method 1: My Album and diary activities
Ethhographic fied notes
Oct 2021
Lifecourse exploration
Method 3: Creative digital workshops
Method 2: Digital literacy sessions
Feb 2022
Introduction to co-design
Intersectional Lifecourse analysis
Method 4: Exploratory introduction to co-design workshops
May 2022
Co-design activities
Co-design workshops
Recruitment of co-designers
Jan 2023
Prototyping activities
Prototype funding awards
Prototype development
Feb 2024
Laying the Foundations for Co-Design
Co-Design Stage

Fig. 1 Connecting Through Culture Project Timeline. N.B. The focus of this paper in yellow: Laying the foundations of co-design. ©Helen Manchester

While the majority of co-researchers engaged with the project face-to-face, including the two co-researchers at the centre of our case studies, three opted for remote participation due to ongoing concerns about COVID-19, caring commitments, and a chronic health condition which made it difficult for one co-researcher to leave her home. Drawing on innovations in qualitative and participatory research since the COVID-19 pandemic (Hall, Gaved, and Sargent 2021; Sattler et al. 2022) we adapted methods to work remotely with co-researchers in one-to-one settings and hybrid group workshops. This involved the first and second authors meeting with the co-researchers attending remotely in a local and familiar community space, setting up and supporting an online video call with the workshop facilitator. The use of multiple cameras within the workshop space enabled these remote participants not only to interact with the facilitator but also with the wider group based in the workshop space, as well as other online attendees. We now turn to outline the four methods we used.

3.3.1 Method 1: My Album and diary activities (1-2-1 setting). Once recruited onto the project, co-researchers were paired with a member of the research team who supported them to carry out two activities: an album accompanied with a set of prompts to document the most important things, people and places in their lives, and a daily diary kept over a 2-week period. These activities were adaptations of photo elicitation methods (Clark-Ibáñez 2004; Sutton-Brown 2014), alongside diary interview approaches (Bartlett 2012; Gibson et al. 2013). Co-researchers selected which media they wanted to use to complete the activities. We provided instant polaroid cameras, voice recorders, and craft and collage materials (in the case of co-researchers participating remotely we sent packages of these materials in the post to them).

Each co-researcher was also offered a data-enabled project iPad and digital literacy sessions (see method 2), with some choosing to use the device to document their lives through photography and audio recordings. Drawing inspiration from the diary interview method (Bartlett 2012), we then held between 2-4 reflective interviews with each co-researcher over a 1-4 month period (see the activities between Mar 2021 and Oct 2021 in Fig.1). The reason for the discrepancy in the number of interviews conducted with each co-researcher is that some preferred multiple shorter interview slots that allowed them to share what they were documenting as they went along, while others chose to get their album and diary relatively complete before sharing. Each interview lasted between 40-90 minutes, with participants talking through what they documented in the albums and diaries. Interviews were held in co-researchers' homes, or in rooms in local community centres.

Rather than us deriving meaning from the data, the reflective interviews enabled a collaborative approach to analysis in which we explored the creation of visual, written and audio data, alongside motivations for documenting particular phenomena and the significance they held in co-researcher’s lives. Overall, the album and diary methods aimed to create a more personal and enjoyable research experience, enabling the research team to build relationships with the co-researchers, while also promoting agency by ascribing co-researchers an active role in selecting which aspects of their lives to document and share.

3.3.2 Method 2: Digital Literacies Sessions (1-2-1 setting). The second author with expertise in HCI, supported by other research team members, led 1-2-1 digital literacy sessions with the co-researchers, which were taken up by 11 co-researchers for between one and eight 120-minute sessions (see the activities between Oct 2021 and Feb 2022 in Fig.1). These sessions were participant-led. They were designed to support co-researchers to build their digital knowledge, skills, literacies and expertise in ways that made sense to them, as well as to increase digital participation relevant to taking part in the project. They aimed to support their autonomy and agency in their learning (Wanka and Gallistl 2021) by exploring a range of opportunities, including social media experiences, online streaming and media consumption, mapping tools, online shopping platforms, digital payments, password protection tools, photography and editing, and biometric and accessibility features. The focus on everyday digital participation and literacies provided insight into the lifeworlds of co-researchers and gave rise to reflective conversations about experiences with technology across the lifecourse, from the workplace to everyday technology in the home today.

3.3.3 Method 3: Creative Digital Workshops (group setting). Following the 1-2-1 creative methods and digital literacies work, we curated a series of creative digital workshops broadly focused on the themes of everyday creative interests, digital engagements and connectivity (see the activities between Oct 2021 and Feb 2022 in Fig.1). In keeping with the emergent approach of PAR (Greenwood and Levin, 1998), rather than planning these workshops prior to the research commencing, they were developed in collaboration with co-researchers, in response to the knowledge and learning co-generated in the earlier stages of the project. They built on our understandings of co-researchers' lifeworlds further, particularly relating to engagements and lived experiences with technology, and helped build relationships and trust within the cohort in preparation for the co-design process.

The workshops were held in community spaces in areas of the city with which many co-researchers were familiar. They drew on a range of visual participatory methods, such as object elicitation (Willig 2017) and digital story telling (De Jager et al. 2017). Some workshops were created and facilitated with co-researchers, focusing on their interests in everyday creative activities. For example, one workshop on 'small scale journaling' was co-facilitated by the third author and a co-researcher. The workshop brought co-researchers together to document "the things that grow in the corners, the grasses, escaped flowers, the stuff that no-one thinks is important." Other workshops enabled co-researchers to experiment with creative activities, such as collage and creating stop motion animation films. In response to co-researchers' desires to develop their digital literacies, others encompassed an interactive focus, with the second author running group activities that introduced them to topics such as digital security and using video-conferencing platforms like Zoom.

3.3.4 Method 4: Exploratory introduction to co-design workshops (group setting). The final set of workshops in this foundational stage of the project were facilitated by a community media arts organisation, Knowle West Media Centre, who are a partner on the project and have extensive experience working with minoritised communities on arts, technology and design projects. The aim of these workshops was to prepare co-researchers for the next stage of the project, a series of co-design workshops with artists, designers, creative technologists and community organisations, which were to be held at a cultural and digital innovation hub in the centre of the city (see the activities between May 2022 and Jan 2023 in Fig.1). The exploratory workshops gave co-researchers the opportunity to try out digital cultural experiences, explore and play with design processes, and develop ideas for prototypes. In keeping with Design Justice approaches described earlier, they aimed to centre the voices and experiences of the minoritised older people involved, given they will be most directly impacted by the outcome of the designs (for example, see Costanza-Chock 2020, pp. 6). Positioning them as 'experts-by-experience', the facilitators supported them to develop prototype ideas for cultural digital experiences that fostered social connection and were grounded in their interests, life experiences and expertise.

3.4 Analysis

The data collected included ethnographic field notes from one-to-one and workshop settings, transcribed recordings from interviews, workshops and digital literacy sessions, and visual materials created by co-researchers. The data was analysed by five members of the research team who we refer to collectively as 'we' in this section. We used established methods of qualitative thematic analysis to identify, analyse and report patterns in the data (Braun and Clarke 2006). This approach allowed for multiple interpretations of the data, drawing on rich textual description and accommodating the diversity of our interdisciplinary perspectives. We used an inductive approach to identify patterns and themes, without trying to fit them into a pre-existing coding framework. We triangulated across all data sources to check for consistency across the findings.

Initially, we worked in twos, with each pair focusing on between 4-6 co-researchers, reading through all the data from 1-2-1 research encounters. Each pair then developed and conceptualised themes – understood as ‘stories’ about patterns of shared meaning – identified across the data set for each co-researcher (Braun and Clarke 2006). Following this, the researchers came back together to analyse the data collected from group workshop settings, engaging in the same process of building and conceptualising themes. We then clustered themes relating to each co-researcher, as well as identifying broader cross-cutting themes across the data. Our analytical approach allowed us to build a rich understanding of subjective experiences of everyday ageing in place, including how co-researchers’ social, cultural and digital lives are shaped by experiences, events, transitions and relations across the lifecourse, alongside structural inequalities.

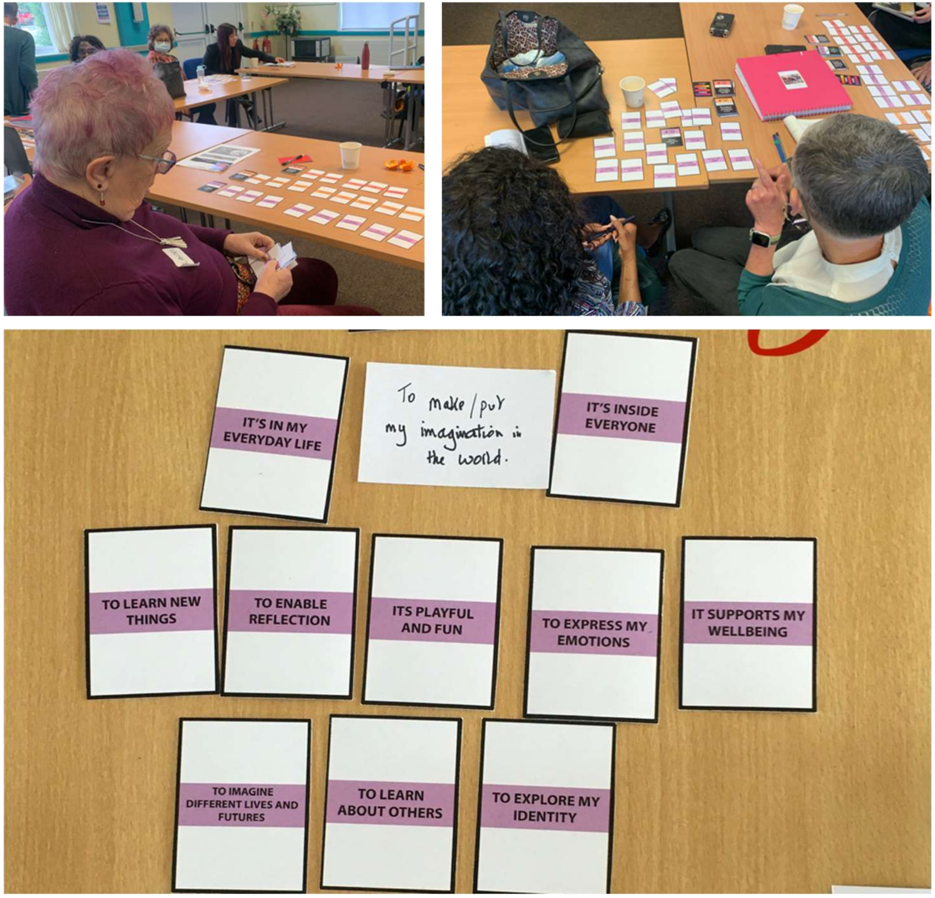
IT'S IN MY EVERYDAY LIFE
To make/put my imagination in the world.
IT'S INSIDE EVERYONE
TO LEARN NEW THINGS
TO ENABLE REFLECTION
ITS PLAYFUL AND FUN
TO EXPRESS MY EMOTIONS
IT SUPPORTS MY WELLBEING
TO IMAGINE DIFFERENT LIVES AND FUTURES
TO LEARN ABOUT OTHERS
TO EXPLORE MY IDENTITY

Fig. 2 Theme Card Sorting Activity with Co-Researchers. ©Helen Manchester

In keeping with reflexive developments of thematic analysis (Braun and Clarke 2019), we engaged in ongoing reflective discussion pertaining to our theoretical sensitivities, positionalities and our differing underlying ontological and epistemological positions. We also developed an iterative process of sharing our overall sense-making and findings with the group of co-researchers and invited their feedback. We did this through a blended approach that encompassed short presentations of our findings followed by group discussion and feedback, alongside other interactive activities. For instance, we designed a set of cards outlining identified themes which we asked co-researchers to order and add to in a group session (see Fig. 2).

3.4 Ethical considerations

Ethical approval was granted by the Faculty of Social Sciences and Law Ethics Committee at the University of Bristol. Some co-researchers on this project would be considered ‘vulnerable’ research subjects as they are socially and economically disadvantaged in ways that can reduce their autonomy and ability to make life choices (Liamputtong 2007). We gained informed consent from each co-researcher, in written or verbal form, at the beginning of the project. We viewed consent as an ongoing process, checking in regularly to ensure co-researchers were happy to participate in each activity and share their data. We gave co-researchers the choice of anonymity (including selecting a preferred pseudonym) or remaining identifiable, engaging in reflective discussion around the implications of their choice. While we are aware that anonymisation is often adopted in studies with minoritised groups, the uncritical acceptance of this practice raises concerns around the voice and authorship of minoritised groups, for example, in cases where participants feel they are offering testimony through their participation in the research (Berkhout 2013). Co-researchers had the choice of receiving either a thank-you shopping voucher or equivalent monetary payment for each month they took part in the first phase of the project.

It’s important to acknowledge, that while the emergent and relational nature of co-produced research offers a more inclusive and democratic approach to doing research, it can be messy, ethically complex and emotionally demanding for everyone involved (Flinders, Wood, and Cunningham 2016). In response to this we developed several ethical protocols. During the project we held reflexive meetings in pairs (through a buddying system) and as a full team to discuss ethical issues pertaining to power, inclusion and participation. This encompassed reflection on our own positionality and privilege such as relating to race, ethnicity, class, gender, ability, age and our position as paid researchers working for a large educational institution. We held reflective discussions around how this shaped the relationships forged with co-researchers, their perceptions of us, and our understanding of their lives and experiences. Community partner organisations also played an active role in ethical discussions throughout, from feeding into our ethical protocols around safeguarding to providing valuable feedback on research activities relating to their inclusivity and accessibility to particular co-researchers. Finally, the project knowledge exchange panel, comprised of representatives from disability-led charities and the ageing sector, also provided a space for us to receive feedback on ethical challenges throughout the course of the research.

In the next section we draw on our data and findings from the foundational stages of the project, drawing on ethnographic field notes, transcribed recordings and photos from the album and diary activities, digital literacy sessions, creative digital workshops and the exploratory introduction to the co-design workshops. We adopt an intersectional lifecourse approach, to introduce two of the co-researchers. We illustrate how this theoretical approach, when brought together with participatory methods, has helped us to understand the nuances and complexities surrounding their relationships to digital technologies, as shaped by the wider lifecourse.

4 CASE STUDY ONE: PANDORA

This section focuses on Pandora, drawing together and analysing data from ethnographic field notes and transcribed recordings from digital literacy sessions, the creative digital workshops, and the exploratory introduction to co-design workshops.

4.1 Introducing Pandora

Pandora is a white woman in her mid 70s who is disabled and lives independently in a block of social housing. She describes herself as an "easy going animal lover with a good sense of humour". Her love of animals, gardening and bird watching is connected to her childhood growing up on a farm. She is also an avid collector of Pandora bracelet charms – the inspiration for her pseudonym. The significance of the charm bracelets in her life was explored through one of the creative digital workshops, in which co-researchers brought an object that had a significant meaning and were supported to develop a digital story about their relationship to the object. Pandora worked closely with author three to arrange the bracelet collection, built over several decades, on colourful cards and create a photo montage. While handling the bracelets together, Pandora shared how each charm represented significant relationships, places and events across her lifecourse.

Fig. 3 Pandora's charm bracelets. ©Helen Manchester

When her health permits, Pandora likes to cook and visit her sister in a neighbouring town. She also enjoys attending the coffee mornings held at a local community centre. Pandora's familiarity with this community space and its proximity to her home made it a suitable location for the 1-2-1 digital literacy sessions alongside some of the group workshops. Through analysis of fieldnotes collected during our ongoing conversations with Pandora we understood that her life is often disrupted by what she refers to as her body 'misbehaving'; the unruliness of her arthritis flare ups, the waves of fatigue brought on by her diabetes, and most recently a loss of sight in one eye. In visits to Pandora's home she told us that she often feels lonely, but we noted that the building she lives in offers a lively web of connectivity, which brings a mix of meaningful moments of felt connection to people and place, alongside disconnection. Neighbours drop round groceries, she loves to meet resident dogs on her way to the laundry room, and in the summer months the daily hubbub of building life travels through her open windows, from the smell of neighbours cooking to the sound of children playing in the communal grounds.

Pandora told us that she regularly finds herself having to navigate disabling built environments. She relies on neighbours to read her electric and gas meters located up two floors of stairs and has been battling with the local authority to get basic adaptations to her home. She explains, "it's taking them so long I sometimes wonder if they're waiting for me to pop my clogs first". The recent decline in her health meant that her flat and garden "doesn't look how she wants it to", which affects her mood and sense of self. She often finds herself "stuck in her flat watching her garden become overgrown" and feeling disconnected from the world beyond her housing block. She also described the insecurity brought about by a letter from the Housing Association stating that she needs to move because her home is “no longer suitable for her needs”.

The challenges Pandora experiences in her daily life meant that the album and diary activity, with their focus on the documentation and reflection of day-to-day life, were emotionally difficult and painful for her to engage with. In keeping with our asset-based approach, we developed ways of researching with Pandora that were responsive to where she was in her life, and her wider interests and motivations for getting involved in the project. Early on in the project she spoke about wanting to find something new to learn and occupy her time at home. This led to a focus on the iPad and us working with Pandora through the digital literacy sessions. We found this approach, particularly it’s person-led focus and iterative way of working over a prolonged period of time, elicited reflection on how experiences across the lifecourse have shaped her relationships with technology and digital participation in later life. It also enabled us to build a relationship with Pandora over time, as we met her for the digital literacy sessions in her favourite cafe, a bench in the grounds of her housing and at her local community centre.

4.2 Exploring Pandora’s relationship to technology

When Pandora started on the project she spoke about her relationship to technology,

> “I really am stuck in the dark ages when it comes to technology… for me, that ship has sailed and it just feels too late to learn that stuff properly”.

Pandora’s initial reluctance around the iPad was partly due to concerns about online security, she also questioned her ability to develop digital literacy and expressed a sense of shame that she had not kept up with digital forms of communication through her life. She also struggled to envision how an iPad might feature and fit into her daily life suggesting that the digital realm felt intangible and unknown. Over the course of 12 months Pandora attended six digital literacy sessions and four workshops with the research team, which enabled her to progressively integrate the iPad into daily life for both practical and pleasurable purposes, later coming to describe it as an extension of her body:

> “I was a bag of nerves when she [the researcher] first gave me that [iPad] – oh what if I drop it and break it? And she said, ‘no you’ll be OK and we wouldn’t worry if you did anyway cos it would be a genuine accident’… When she handed me it, I was frightened to touch it, and now its like an extension of my body [laughs].”

Particularly significant for Pandora was that she was able to do online shopping, receive utility bills via her new email account (giving up paper billing saved money), look up the bus routes for visiting her sister in a nearby town, and watch her favourite TV shows from her bed in the evening when she no longer wanted to sit upright in her chair.

Through the course of the digital literacy sessions, we learnt how an intersection of structural inequalities (pertaining to class, ability, her role as a carer prior to the death of her partner) across the lifecourse mediates Pandora’s relationship with digital technology in the present. The rhythms and flows of her past working life, which brought her into different lines of work, have a significant bearing on her digital literacy and participation now. She worked as a waitress in nightclubs, in retail, and later in a cloth factory until she stopped paid work ten years ago to look after her late husband when he had a stroke. Her work didn’t require the development of digital literacies, and money was hard to come by when her husband lost his income – “getting a computer at home just wasn’t a priority”. Today, while Pandora would like to have WIFI in her home, the modest income from her pension and government benefits, coupled with the rising cost of living, means that she cannot meet the cost of an additional utility bill.

The digital literacy sessions enabled reflective discussion on the embedding of digital technology into Pandora's lifeworld, but also insight into her distrust of technology. On one occasion in the summer the second author met with Pandora on a bench in the communal area outside her block of housing to catch up on her progress with the iPad. Pandora arrived wearing a new pair of trousers. These were one of her first online purchases, although she was initially reluctant to purchase clothes online as she wasn't able to feel the quality of the fabric. This exchange about fabric prompted Pandora to tell a story about her time working in a cloth factory – a period that left her with what she described as a strong distrust of technology. It was piecework so people were under pressure to perform and produce as quickly as possible. She painted a picture of the chaotic factory floor. The whizzing of the loud machinery responsible for some of her hearing loss today. She spoke about the unpredictability of the automated technology that used to malfunction, on two occasions resulting in the flying metal shuttles careering into workers.

> "Two times the shuttles went AWOL - suddenly moved across the belt when it wasn't supposed to, and hit two workers, seriously injuring them... One guy was hit in the head and was never the same after that, and another woman in the chest... Now you know where my distrust of technology comes from."

This feeling was also compounded by both her sisters losing their jobs to automated technology on the factory floor. While Pandora recognised the advances in digital technologies and computers today, these experiences had contributed to her feeling that technology in its myriad forms "just wasn't for her". However, this identity was in flux through the shifting proximity of technology in Pandora's lifeworld as she negotiated a place for the digital, integrating the iPad in ways that made sense to her. This came with a range of challenges, most notably the second author supported her to operationalise the limited accessibility functions built into the iPad, to best suit the level of dexterity in her hands and her visual impairment.

While a complex interplay of structural disadvantages across the lifecourse, combined with accessibility challenges, shape Pandora's relationship with technology today, this has to be understood alongside her agency in circumnavigating these challenges. Pandora mobilised her own community and friendship networks to develop her digital literacies outside of her involvement in the project, for example exchanging favours with neighbours who helped her out on the iPad when she got stuck and shared their WIFI when she couldn't get the data sim card working. She also adopted a range of material practices that illustrate her ownership and agency in integrating the device into her life. She discarded the original iPad case because it "just wasn't her colour" and it didn't go with her clothing style, reminding her of a pattern on a bedspread. She opted for one that was more uplifting, colourful and lively, and also acquired a bright stripey over-the-shoulder travel case for visits to her sister – something she was "proud to wear on the bus journey there!". She also discarded the original stylus pen (selected by an able-bodied member of the research team) because the shape and functionality was "useless", instead acquiring one that was recommended by a friend who also suffered from dexterity loss.

Further through the project, in preparation for the co-design workshops, Pandora and Miss Edwards, along with other co-researchers, participated in the exploratory introduction to co-design workshops held at the Knowle West Media Centre (described in 3.3.4). Fig. 4. captures a prototype idea designed by Pandora and other co-researchers who attended the workshop, several of whom spent a significant amount of time at home due to chronic health conditions and disabilities. They were asked to design a product or experience they would enjoy that either builds social connection and/or improves wellbeing or access, using some kind of technology. Despite being concerned that she wasn’t very aware of different technologies an idea came from talking to other group members about her deep connection with animals and nature related to growing up on a farm. She vividly recalled the feeling of being in the stall with calves quite soon after they were born – how peaceful and relaxed this made her feel and how connected she felt to them. The group all shared experiences of their connections to nature and animals, and the peace that this brings to them. They designed an immersive home-based technology that would transport them to other places and connect them with nature and animals. It would project images and sounds into their current homes to recreate this sense of deep connection with the natural world. As depicted in the photos (Fig. 4), this prototyping activity, in which Pandora and other co-researchers shared stories from across their lifecourses’, enabled the group to forge mutual points of commonality and build relationships. It also grounded prototyping as a design activity that is responsive to co-researchers’ lives, interests and experiences, thus supporting them to build agency and ownership over the design processes ahead of the collaborations forged in latter stages of the co-design project.

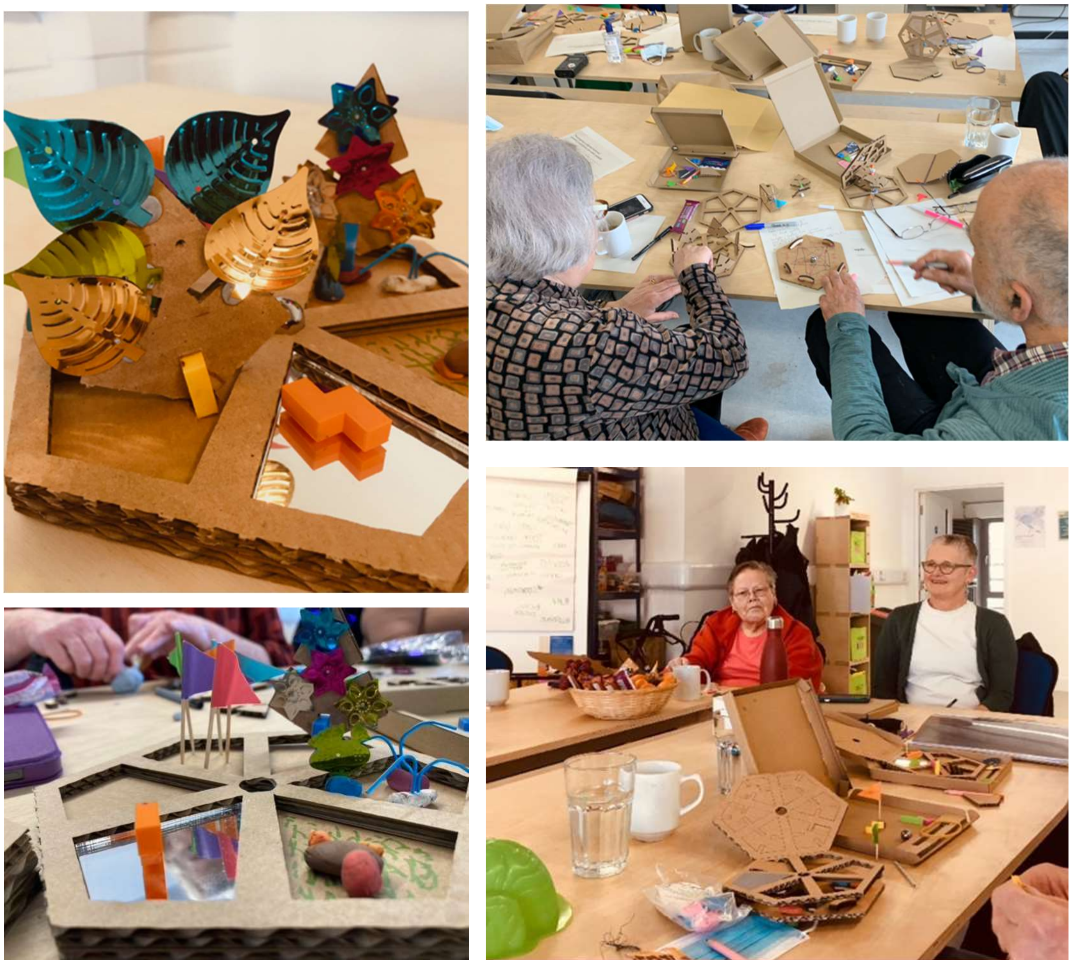

Fig. 4 Pandora's prototype design (top left) in one of the exploratory introduction to co-design workshops. ©Helen Manchester

5 CASE STUDY TWO: MISS EDWARDS

This section focuses on Miss Edwards, drawing together and analysing data from ethnographic field notes and transcribed recordings from My Album and diary activities, digital literacy sessions, the creative digital workshops, and the exploratory introduction to co-design workshops.

5.1 Introducing Miss Edwards

Miss Edwards is a 66-year-old black woman from Jamaica, who moved to the UK in 1999. She lives in a small flat in a sheltered housing block for older people, with her husband, Mr Edwards, who's white. Miss Edwards is very active in her church which is hugely important to her. She particularly loves taking part in gospel singing and music. She also has a love of colourful fabrics and clothes and enjoys getting dressed up to attend church services. When she has dips in her health and is not able to travel to church on her mobility scooter, she joins the congregation via their YouTube channel using her phone.

> "I have always been church… cos with all the world going bad, God is the only answer to it, … Some Sundays I don't go cos of the rain, because I ride my bike [mobility scooter], and if the rain outside not looking good, I'm not going. [If] I'm in pain and I prefer stay at home, cos some mornings I wake up and I know it's Sunday morning but I don't feel like going so I just stay home and watch it, you can watch it from YouTube, when I put it on live."

Miss Edwards has numerous health problems including diabetes, swollen feet, back and knee pain which is exacerbated by her spending a great deal of time in her armchair and so got worse during Covid-19 lockdowns. Much of the time she leans back in her chair and puts her feet up on a footstool with a cushion. She has real difficulty sleeping and her walking is very limited. She has good days and bad days. Miss Edwards also describes finding traditional literacies such as reading and writing difficult. She has four children and eleven grandchildren. When she came to the UK she had to leave her children in Jamaica and they now live across the world in Canada, the Caymans, and Jamaica.

Through visits to Miss Edwards's home, we've seen how cramped her living conditions are. She has trouble moving about as the doorways are narrow and there's not enough room for their possessions so the flat feels very cluttered. Our visits also illustrated her diasporic life and the material and social connections she retains with her children and grandchildren who live abroad. Between the two armchairs is a huge blue barrel taking up a significant proportion of the living room. Miss Edwards spends some time collecting items that she thinks her daughter can sell in her small shop in Jamaica. Over time the barrel fills up and when it's full she ships it off to her daughter.

Miss Edwards's medications, related to her chronic health condition, take up a lot of room. She points to her "pharmacy at home", which includes medications stacked up beside her on top of a cabinet, pill packets and bottles of lotions. In one reflective interview in her home, the materialities of the medications stimulate a long conversation with Miss Edwards about her self-care. She can reel off all the names of her pills and how often she needs to take them.

Miss Edwards loves music, meeting people and having fun. She describes herself in her own words as "pleasant, jokey and kind". However, her health impacts her ability to be social. She has a mobility scooter and travels miles on it. She combines her love of music with these scooter trips – playing the music on her wireless speaker as she goes for her rides. As her husband is also not well, they joke that they should design scooters with a running board on the back and then she could take him out.

Miss Edwards's sociability and desire to use technologies to connect with her diasporic family provided a starting point for our work with her. Through visiting Miss Edwards in her home, we were able to slowly build trust. Miss Edwards was keen for us to understand her life beyond her current situation, to introduce us to the complex web of social and cultural relationships she retains across the globe and to develop her abilities to use technologies creatively to communicate, in order to overcome barriers related to traditional literacies. The album activity played a central role in this process.

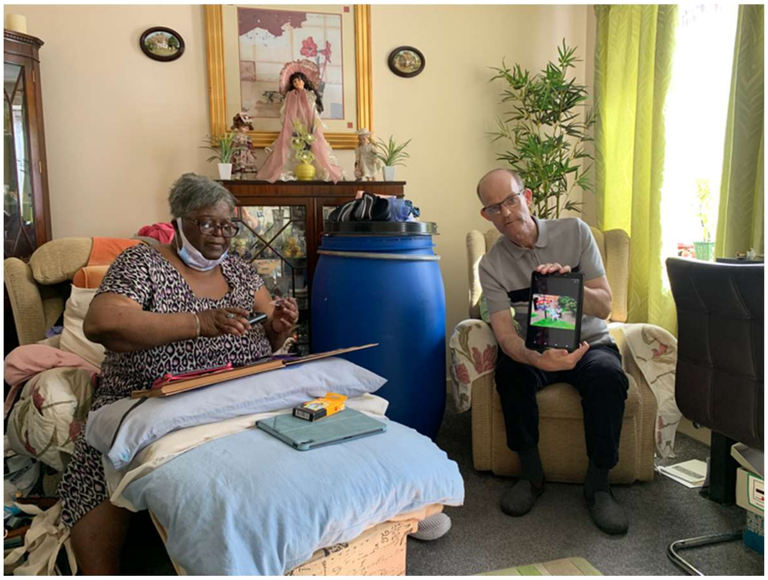

Fig. 5 Miss Edwards, working on her My Album, and her husband in their living room. ©Helen Manchester

5.2 Exploring Miss Edwards's relationship to technology

Beyond the materiality of Miss Edwards's flat, through our creative and relational approaches, initially with author 4 working one to one with her, we heard more about her passions and worries now, and how lifecourse experiences have shaped her relationships with technologies. Her journey from Jamaica to the UK and the importance of family in her life, combined with her current capabilities for travel, are important motivations for her use of technologies today.

She misses her children but is pragmatic and connects with them through sharing photos and videos using WhatsApp, Instagram and Facebook. This helps her to feel involved in their lives as she can't now afford, and isn't physically able, to visit them. Regular digital contact is also an important part of her daily routine given she spends a significant amount of time at home due to her health conditions. She has two smartphones (one she referred to as her 'Zoom' phone') and a tablet, which she uses for hours each day to communicate with friends and family.

> "Me talk a lot on the phone, everywhere, Jamaica, Canada, Washington. You have to do this when you're shut up [in the house], and I am more than usual because of the health reasons. And [during covid] you couldn't get even outside, especially because me live in a block of flats."

Her phones, in particular, are always nearby and buzz loudly each time she receives a message. Due to her struggling with reading and writing she has had to find inventive workarounds, including rote learning passwords and sequences of actions involved in digital processes

As well as navigating the reading and writing requirements of digital access, due to her physical health, technologies can be disabling for Miss Edwards. For instance, she has been given a reconditioned laptop by the church, but finds it very difficult to use, because she often has to have her feet up on cushions and finding somewhere to put the laptop where she can easily use it is challenging. It is also old and slow and came with no training or support. During lockdown the church sent her links on WhatsApp to services via Zoom – she knows how to find and click on the link.

From our first encounters with Miss Edwards, she was very keen to make the most of the free iPad we provided for her personal and project use. The iPad was easier to use as she sat in her chair with her legs up, for instance to attend church services via Zoom. Through the initial digital literacies sessions to support her to use the iPad we learnt a lot about her motivations and agency in using technology and her determination to make it work, against the backdrop of differential life chances that have created barriers related to her literacy and digital literacy levels, as well as physical ill health. This determination relates back to her drive to stay connected with her family who are dispersed across the world, and with her church.

When we asked Miss Edwards about what she would like to do with the creative My Album activity she was very interested in sharing photos of herself, family and friends and having us scan and print them to add into the album. Using mini photo printers we scanned and printed pictures she had stored on her tablet and Messenger, and WhatsApp photos that had been sent to her too. This activity helped us to hear more about Miss Edwards' life and her experiences across the lifecourse, about how she navigates multiple social identities within systems of oppression. Her husband also wanted to get involved in the conversation, to tell stories of their relationship. Using photos of himself at work in a furniture store – in the corridor, in the bed department – he told of this being where they first met, it was "love at first sight". Together Miss and Mr Edwards told stories of their past lives, the friends they have made over the years, family members and their own pride in their garden, dressing up and having people around. Miss Edwards was particularly proud of her fashion sense and pulled out photos where she is dressed up in bright outfits, looking glamorous in her top to toe blue and silver Jamaican outfit (see Fig. 6.).

Through the photography sharing and curation of the album alongside Miss Edwards we heard more about her experiences across the lifecourse. The materiality of the photos when printed created a focus for our conversation. We were able to better understand what has given her joy over her life and how particular experiences and events are marked by racialised and socioeconomic inequalities, and inequalities related to her chronic ill health. One of the photos shows Miss Edwards in the office of a city nightclub where she worked nights cooking in the kitchen. Another proudly displays a hanging basket of flowers she planted in the communal grounds of her building, which she can see out of her living room window. Rather than being about 'reminiscence' or nostalgia the process here was much more fluid. She did not organise her album chronologically, rather she drew on older photos and more recent images from her phone album and WhatsApp, weaving across time, space and cultures as she introduced important people and places in her life.

Despite being settled in the UK Miss Edwards retains strong diasporic connections to Jamaica and other countries where her children and friends live. She told us that this is not only about keeping in touch; having contacts spread across the world helps Miss Edwards to feel that closeness is possible despite distance and that she can stay connected despite being physically limited in terms of travel. She likes to be reminded of the history, sights, smells and tastes of her younger life in Jamaica. She uses technology creatively and finds workarounds for the barriers she encounters in relation to traditional literacy skills, such as using WhatsApp audio and making selfie videos which she posts on Facebook. These are short videos of herself, for instance, sitting in her chair at home talking about the weather in the UK or recording herself singing along to gospel music.

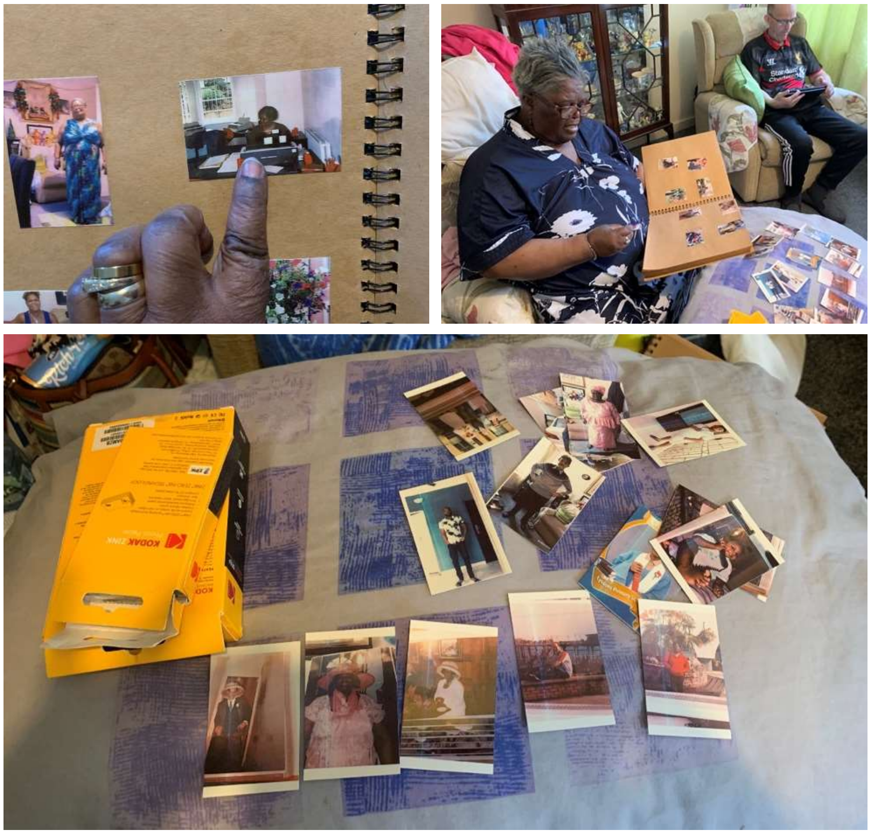

Fig. 6 Miss Edwards presents photos from her life that were later placed within her My Album. ©Helen Manchester

Stories of caring for others and of having fun come up often in conversation with Miss Edwards. These stories are often bound up with her ongoing diasporic relationships with family in Jamacia and friends in other countries, or young or older people she has taken care of in difficult times for them. Through technologies she can continue to care for and directly connect with her family and others globally, she is able to share the life she lives here in the UK with them, to understand their situations and continue to support them, and to instil joy in her own life and in theirs as she goes about it.

Through visiting Miss Edwards in her home, we began to better understand aspects of her life as she experiences it materially as an older black, disabled person, living a diasporic life. We also saw the enabling and disabling elements of her technology use in everyday life. Through meeting her husband and engaging in the My Album activity, in particular through the use of photographs, we were introduced to her experiences across the lifecourse. We heard about her journeys through space, time and across cultures, and how they have informed how she lives her life today. The methods helped us to understand the important role of technologies in supporting her to continue to journey, even whilst living with conditions of impairment.

6 DISCUSSION

In this section we bring together insights from our case studies, discussing how the intersectional lifecourse lens together with participatory methods, enabled us to:

1. Support the voice and agency of minoritised older adults
2. Build trust and relationships with older adults
3. Understand the complexities of ageing and everyday digital participation in place
4. Expand our understandings of co-researchers' lives beyond the present
5. Depart from deficit understandings of ageing and technology

We expand on each of the above, which we understand as overlapping and interconnected, reflecting on how they helped lay the foundations for co-design in the latter parts of the project. We then address some of the limitations of our study, before finishing with some concluding reflections.

6.1 Laying the foundations for co-design: 5 affordances of an intersectional lifecourse lens and participatory methods

6.1.1 Supporting the voice and agency of minoritised older adults. Our findings point towards the value of engaging with justice-orientated design and research approaches that involve collaboration with minoritised communities in order to foreground their voices and participation (Costanza-Chock 2020). As Avram (Jaz et al. n.d.) describes, collaboration in co-design requires a shift from a focus on 'human centred design' from the outputs of design (i.e., the technology and the experience of the 'end-user') towards the process of design which often requires additional flexibility and the redistribution of traditional power relations. Our participatory methods were flexible and responsive to co-researchers' lives and abilities, providing them with choices in selecting which aspects of their lives they wanted to document and share, through media, materials and processes that made sense to them.

In Pandora's case, the digital literacy sessions and her participation in the creative digital workshops were directly informed by her interests, experiences and needs, as defined by her. We saw this in the way she set the learning agenda for the digital literacies sessions and through the workshop process that supported her agency in developing an imaginary digital prototype that fitted into her lifeworld and spoke to the desires of other co-researchers. The foundational stages of the project also helped to scaffold the design capabilities of co-researchers, supporting them to engage with future design activities in the next stage of the project. In Pandora's case, but also with many of co-researchers, the foundational stages nurtured their creative and digital confidence. It also deepened understanding around the resources and support needed to ensure co-researchers could participate as fully as possible in the co-design process that followed.

In Miss Edward's case we developed deep understandings of her literacy abilities, her creative digital workarounds and her love of fabric and Jamaican culture, which we were able to build on through her involvement in one of the six prototype projects. Miss Edwards plays an important role in the Expressive Pockets prototype project, feeding in her cultural knowledge and expertise to embed her Jamaican culture and heritage into the project development.

6.1.2 Building trust and relationships with older adults. We echo the sentiments of Bischof and Jarke (Bischof and Jarke 2021), who underline the importance of the ‘fuzzy front-end’ (Sanders and Stappers 2008) for projects involving older adults as it enables the building of social bonds and trust. The participatory methods we adopted were deeply relational, involving the research team visiting the co-researchers in the spaces and places of their everyday lives over a sustained period of time and being entrusted with personal stories. We gained a sense of this through the intimate sociomaterial encounters that unfolded between the researcher and Pandora through the arrangement of the bracelet collection and the sharing of personal stories about the origin and significance of the charms. The workshop methods also led to the building of relationships amongst co-researchers. For instance, we heard how the prototyping activity at the community arts venue (see timeline in Fig. 1.) enabled Pandora and the group to trace common experiences relating to both their love of the natural world, and the challenges their chronic health conditions and disabilities posed for maintaining this connection in later life. The building of these social bonds has been particularly foundational to the later stages of the project, as co-researchers have worked together, and with designers and artists, in the six prototype teams (See timeline in Fig. 1.).

6.1.3 Understanding the complexities of ageing and everyday digital participation in place. In contrast to design processes that are located in laboratories, studios and industry meeting rooms our research was situated in the everyday lifeworlds of the older adults, including the places, contexts and communities in which they live. We believe that our situated approach offers a much needed alternative to design methods that rely on ‘scripts’ or ‘personas’ that perpetuate ageist stereotypes of older adults that are dislocated from their everyday lives (Cozza, Cusinato, et al. 2020). The situated and iterative nature of our approach, in which we made repeated visits to co-researchers' homes, neighbourhoods and local community spaces, enabled a deep understanding of daily life in the present. We gained insight into ageing in place and the temporal rhythms of life, such as the passing of time at home and the embodied experiences of place, social lives, pleasures, and future desires, such as we sat on the bench with Pandora outside her block of flats. Researching in place with co-researchers also allowed us to explore, through an intersectional lens, the ways in which technology is woven into the materiality of everyday life, while recognising how this is shaped by interlocking structural inequalities that constrain what co-researchers are able to be and do with digital technology. For instance, Miss Edwards’ cramped flat and the large blue water barrel illustrating her continued diasporic connections despite the limiting material conditions of her current everyday life. In both of the cases, and across the wider cohort of co-researchers, we learnt how everyday digital participation is shaped by literacies, household income, cramped living conditions, physical disabilities, chronic health conditions, and other structural inequalities. However, our research encounters also brought home the agency, creativity and perseverance co-researchers demonstrated in finding everyday hacks and workarounds to ensure digital devices worked for them. In Miss Edwards case she learnt video and audio-based forms of sharing on social media that work with her literacy abilities, and in Pandora’s case the reciprocity she built with neighbours enabled her to stay digitally connected.

6.1.4 Expanding our understanding of co-researchers’ lives beyond the present. The participatory methods we adapted in each context enabled an expanded understanding of co-researchers’ lives beyond the present that in turn supported us to better understand their experiences of inequalities across the lifecourse. For instance, we found that the majority of co-researchers used photographs and visual images to express elements of their lives in their albums and that the relational process of printing and arranging them stimulated discussion. The images enabled co-researchers to share more nuanced narratives of their lives that situated the present against a backdrop of events across the lifecourse. In Miss Edwards’ case this included experiences of migration, love, faith and loss.

The album activity enabled Miss Edwards to curate and tell stories about her life, and to hold agency through her selection of photos and her narration of why they were significant. Similarly, the participant-led reflective discussions during the digital literacy sessions offered an expanded understanding of how Pandora's experiences of technology in older age are mediated by the trajectory of her working life, from the nature of her work to specific experiences of technology on the factory floor, and in relation to her close relatives.

When prototyping in the workshops, co-researchers were able to bring both their present-day experiences but also their experiences, pleasures and desires from across the lifecourse. For instance, Pandora's ideation around the immersive home-based prototype was shaped by childhood experiences as well as her current everyday life. She drew on her recent sense of disconnection from the outside world beyond her flat to design a sensorially rich immersive experience of nature that she traced back to her feelings of comfort and connection she'd felt during her childhood growing up on a farm. This early ideation activity enabled us to lay the foundations for a technological co-design process that located and embedded technology in the lived experiences across the lifecourse, alongside the practicalities of technologies in use in older adults lifeworlds (Bischof and Jarke 2021).

6.1.5 Departing from deficit understandings of ageing and technology. Bringing an intersectional lifecourse approach together with creative participatory methods, enabled us to depart from deficit understandings of ageing that position older adults as digitally reluctant, or as passive users of digital technology, with an overwhelming focus on technologies for meeting practical needs in older age (Manchester and Jarke 2022). This supports other research in the CSCW field working to broaden understandings of ageing, "from the rhetoric of assistance and vulnerability to one that prioritises the agency of older people and how this plays out in the connections and relations between people, their living environments, technologies, and artefacts" (Light et al. 2015, pp. 295).

In the case of Miss Edwards, we hear about her digitally mediated transatlantic connections and the sharing of everyday life with friends and family. Through Miss Edwards, and other co-researchers with experiences of migration, we gain an understanding of how technology shapes the ways in which diaspora is lived and imagined in the taking place of everyday life in the home, community spaces, and urban neighbourhoods. With Pandora, we gain insight into the gradual embedding of digital technology into social and material life, and the tensions and challenges she encounters along the way. Central to this is not only the adaptations she makes to enable accessibility, but also the expression of her identity and the exercising of agency through the personalisation of the iPad to suit the everyday aesthetics of her life. In summary, our creative participatory methods enabled an in-depth understanding of the older person, beyond their lives in the present, challenging stereotypes and imaginaries of older adults, digital technologies, and everyday cultural lives. Our findings underscore the agency minoritised older people hold in carving out a meaningful space for technology in their daily lives.

6.5 Addressing research limitations

As the Connecting Through Culture project is currently still in progress, the findings in this paper only focus on the front-end of the co-design process, an often overlooked phase in which it is crucial to build in-depth understandings of our collaborators. Thus, we presented a small number of in-depth portraits of ageing and older adults' situated relationships with technology, illustrating the application of the intersectional lifecourse approach and participatory methods. While there may be shared experiences presented in the case studies that will resonate with other older adults, we do not intend to produce generalisable findings and conclusions. Instead, the purpose is to illustrate the nuance and diversity of older adults' lives and to demonstrate to researchers working in this area how lifecourse approaches and participatory methods can be used to better understand their collaborators. In publications focused on the future stages of our co-design process, we will be exploring the extent to which the resulting technologies can be scaled to serve wider audiences.

Furthermore, we recognise that making use of different participatory methods, as well as considering the long-term impact of design activities on the lives of older people, particularly minoritised older people, may be difficult for projects that are limited by time and financial resources (Blair and Minkler 2009). In our future work, we will report further on the critical role that community partners and organisations play in supporting research and co-design activities, particularly the agency and participation co-researchers.

7 CONCLUSIONS

To conclude, contrary to widely held societal prejudices, older adults, particularly minoritised older adults, are a rich and diverse group. How we worked with the co-researchers at the centre of our project in these initial phases and the methods we engaged with are reflective of our asset-based approach to understanding ageing and co-design, and the valuable lived experiences and expertise older adults bring to the process. Just as has been encouraged for other generational groups (Druin 2002), older adults should participate in design in ways that afford them agency while offering social and cultural enrichment to their lives. Using participatory methods to engage with their personal histories, we have garnered a much richer picture of individual capabilities and how best to support participation in collaborative design processes. In doing so, we are laying the groundwork for the co-design of technologies that reject the homogenisation of older adults and instead, better reflect their diverse lives, interests, passions, curiosities and hopes for the future. We look forward to reporting on how the foundational stages of the project~~,~~ has influenced the next stage of our co-design process in following publications.

REFERENCES

Akama, Yoko, Ann Light, and Takahito Kamihira. 2020. Expanding Participation to Design with More-than-Human Concerns. Pp. 1–11 in *ACM International Conference Proceeding Series*. Vol. 1. Association for Computing Machinery.

Akrich, Madeleine. 1995. User Representations Practices, Methods and Sociology. Pp. 167–84 in *Managing Technology in Society. The Approach of Constructive Technology Assessment*. London/ New York: Pinter.

Akrich, Madeleine. 1992. The De-Scription of Technical Objects. *Shaping Technology-Building Society: Studies in Sociotechnical Change.*

Bannon, Liam J. 1995. From Human Factors to Human Actors: The Role of Psychology and Human-Computer Interaction Studies in System Design. Pp. 205–14 in *Readings in human–computer interaction*. Elsevier.

Barkhuus, Louise, Elizabeth Bales, and Lisa Cowan. 2017. ‘Internet Ecologies of New Mothers: Trust, Variety and Strategies for Managing Diverse Information Sources’. *Proceedings of the Annual Hawaii International Conference on System Sciences* 2017-January:2283–92. doi: 10.24251/HICSS.2017.276.

Barnard, Yvonne, Mike D. Bradley, Frances Hodgson, and Ashley D. Lloyd. 2013. Learning to Use New Technologies by Older Adults: Perceived Difficulties, Experimentation Behaviour and Usability. *Computers in Human Behavior* 29(4):1715–24.

Barron, Amy. 2019. 'More-than-representational Approaches to the Life-Course'. *Social and Cultural Geography*. doi: 10.1080/14649365.2019.1610486.

Bartlett, Ruth. 2012. 'Modifying the Diary Interview Method to Research the Lives of People With Dementia'. *Qualitative Health Research* 22(12):1717–26. doi: 10.1177/1049732312462240.

Bengtson, Vern L., Elisabeth O. Burgess, and Tonya M. Parrott. 1997. Theory, Explanation, and a Third Generation of Theoretical Development in Social Gerontology. *The Journals of Gerontology*: 52: 72–S88

Berkhout, Suze G. 2013. Private Talk: Testimony, Evidence, and the Practice Of Anonymization in Research. JFAB: *International Journal of Feminist Approaches to Bioethics: 6: 19-45*

Binder, Thomas, Eva Brandt, and Judith Gregory. 2008. Design Participation(-s). *CoDesign* 4(1):1–3. doi: 10.1080/15710880801905807.

Bischof, Andreas, and Juliane Jarke. 2021. 'Configuring the Older Adult'. Pp. 175–88 in *Socio-gerontechnology*. Routledge.

Blair, Thomas, and Meredith Minkler. 2009. 'Participatory Action Research with Older Adults: Key Principles in Practice'. *Gerontologist* 49(5):651–62. doi: 10.1093/geront/gnp049.

Braun, Virginia, and Victoria Clarke. 2006. 'Using Thematic Analysis in Psychology'. *Qualitative Research in Psychology* 3(2):77–101. doi: 10.1191/1478088706qp063oa.

Braun, Virginia, and Victoria Clarke. 2019. Reflecting on Reflexive Thematic Analysis. *Qualitative Research in Sport, Exercise and Health* 11(4):589–97.

Brooks, Abigail, and Sharlene Nagy Hesse-Biber. 2007. 'An Invitation to Feminist Research'. doi: 10.4135/9781412984270.n1.

Carstairs, S., and Keon W.J. 2008. *Issues and Options for an Aging Population Second Interim Report, Special Senate Committee on Aging*. Second Interim Report, Special Senate Committee on Aging, Ottawa.

Clark-Ibáñez, Marisol. 2004. Framing the Social World with Photo-Elicitation Interviews. *American Behavioral Scientist* 47(12):1507–27.

Costanza-Chock, Sasha. 2020. ‘Design Justice’. *Design Justice*. doi: 10.7551/MITPRESS/12255.001.0001.

Cozza, Michela, Augusto Cusinato, and Andreas Philippopoulos-Mihalopoulos. 2020. ‘Atmosphere in Participatory Design’. *Science as Culture* 29(2):269–92. doi: 10.1080/09505431.2019.1681952.

Cozza, Michela, Britt Östlund, and Alexander Peine. 2020. When Theory Meets Practice in Entanglements of Ageing and Technology. *TECNOSCIENZA Italian Journal of Science and Technology Studies* 11(2):5–11.

Degnen, Cathrine, Julia Twigg, and Wendy Martin. 2015. Ethnographies of Ageing. Pp. 127–34 in *Routledge Handbook of Cultural Gerontology*.

Druin, Allison. 2002. ‘The Role of Children in the Design of New Technology’. *Behaviour and Information Technology* 21(1):1–25. doi: 10.1080/01449290110108659.

Ehn, Pelle. 2008. Participation in Design Things. in *Proceedings of the Tenth Conference on Participatory Design*.

Elder Jr Glen H. and Giele, Janet Z. 2009. Life course studies: An evolving field

Ferrer, Ilyan, Shari Brotman, and Sharon Koehn. 2022. ‘Unravelling the Interconnections of Immigration, Precarious Labour and Racism Across the Life Course’. *Journal of Gerontological Social Work*. doi: 10.1080/01634372.2022.2037805.

Flinders, Matthew, Matthew Wood, and Malaika Cunningham. 2016. The Politics of Co-Production: Risks, Limits and Pollution. *Evidence and Policy* 12(2):261–79.

Foong, Pin Sym. 2016. The Value of the Life Course Perspective in the Design of Mobile Technologies for Older Adults. Pp. 165–81 in *Mobile Communication in Asia*. Springer.

Freire, Paulo. 1996. *Pedagogy of the Oppressed*. Penguin Books Australia’. 1–160.

Gallistl, Vera, Rebekka Rohner, Alexander Seifert, and Anna Wanka. 2020. ‘Configuring the Older Non-User: Between Research, Policy and Practice of Digital Exclusion’. *Social Inclusion* 8(2):233–43. doi: 10.17645/si.v8i2.2607.

Gaugler, Joseph E., Rachel Zmora, Lauren L. Mitchell, Jessica M. Finlay, Colleen M. Peterson, Hayley McCarron, and Eric Jutkowitz. 2019. ‘Six-Month Effectiveness of Remote Activity Monitoring for Persons Living With Dementia and Their Family Caregivers: An Experimental Mixed Methods Study’. *The Gerontologist* 59(1):78. doi: 10.1093/GERONT/GNY078.

Gaver, Bill, Tony Dunne, and Elena Pacenti. 1999. 'Design: Cultural Probes'. *Interactions* 6(1):21–29. doi: 10.1145/291224.291235.

Gaver, William. 2002. *Designing for Homo Ludens*. I3 Magazine. 12.

Gibson, Barbara E., Bhavnita Mistry, Brett Smith, Karen K. Yoshida, David Abbott, Sally Lindsay, Yani Hamdani, Doug Biggar, Vivien Harris, Nadia Serrao, and Kathleen McLeod. 2013. 'The Integrated Use of Audio Diaries, Photography, and Interviews in Research with Disabled Young Men'. *International Journal of Qualitative Methods, 12(1), 382-402. https://doi.org/10.1177/160940691301200118*

Goertz, Gary, and Amy G. Mazur. 2008. 'Politics, Gender, and Concepts: Theory and Methodology'. *Politics, Gender, and Concepts: Theory and Methodology* 1–307. doi: 10.1017/CBO9780511755910.

Grigorovich, Alisa, Pia Kontos, Amanda Jenkins, and Susan Kirkland. 2022. Moving Toward the Promise of Participatory Engagement of Older Adults in Gerotechnology. *Gerontologist* 62(3):324–31.

Hall, Johanna, Mark Gaved, and Julia Sargent. 2021. 'Participatory Research Approaches in Times of Covid-19: A Narrative Literature Review'. *International Journal of Qualitative Methods* 20. doi: 10.1177/16094069211010087.

Hendriks, Niels, Karin Slegers, and Pieter Duysburgh. 2015. 'Codesign with People Living with Cognitive or Sensory Impairments: A Case for Method Stories and Uniqueness'. *CoDesign* 11(1):70–82. doi: 10.1080/15710882.2015.1020316.

Hockey, Jenny, and Allison James. 2003. *Social Identities across the Life Course*.

Hollweck, Trista. 2015. ' Robert K. Yin. (2014). Case Study Research Design and Methods (5th Ed.). '. *Canadian Journal of Program Evaluation* 30(1):108–10. doi: 10.3138/CJPE.30.1.108.

Holman, Daniel, and Alan Walker. 2021. 'Understanding Unequal Ageing: Towards a Synthesis of Intersectionality and Life Course Analyses'. *European Journal of Ageing* 18(2):239–55. doi: 10.1007/s10433-020-00582-7.

Hopkins, Peter, and Rachel Pain. 2007. Geographies of Age: Thinking Relationally. *Area* 39(3):287–94.

De Jager, Adèle, Andrea Fogarty, Anna Tewson, Caroline Lenette, and Katherine M. Boydell. 2017. 'Digital Storytelling in Research: A Systematic Review'. *The Qualitative Report,* 22(10), 2548-2582. https://doi.org/10.46743/2160-3715/2017.2970

Jarke, Juliane. 2021. *Co-Creating Digital Public Services for an Ageing Society*. Vol. 6. Springer

Jaz, Gabriela Avram, Hee-Jeong Choi, Stefano De Paoli, Ann Light, Peter Lyle, and Maurizio Teli. 2019. 'Repositioning CoDesign in the Age of Platform Capitalism: From Sharing to Caring'. CoDesign: International Journal of CoCreation in Design and the Arts, 15(3), 185-191. https://doi.org/10.1080/15710882.2019.1638063

Kara, Helen. 2015. *Creative Research Methods in the Social Sciences: A Practical Guide*. Bristol: Policy Press.

Katz, Stephen. 1996. *Disciplining Old Age: The Formation of Gerontological Knowledge*. University Press of Virginia.

Kyng, Morten. 2010. *Bridging the Gap Between Politics and Techniques: On the next Practices of Participatory Design. Scandinavian Journal of Information Systems.* Vol. 22(1): 5

Liamputtong, Pranee. 2007. *Researching the Vulnerable: A Guide to Sensitive Research Methods*. London: SAGE publications.

Liechty, Toni, and Careen M. Yarnal. 2010. 'Older Women's Body Image: A Lifecourse Perspective'. *Ageing and Society* 30(7):1197–1218. doi: 10.1017/S0144686X10000346.

Light, Ann, and Yoko Akama. 2014. 'Structuring Future Social Relations: The Politics of Care in Participatory'. in *proceedings of the 13th Participatory Design Conference*.

Light, Ann, Tuck W. Leong, and Toni Robertson. 2015. 'Ageing Well with CSCW'. *ECSCW 2015: Proceedings of the 14th European Conference on Computer Supported Cooperative Work, 19-23 September 2015, Oslo, Norway* 295–304. doi: 10.1007/978-3-319-20499-4_16.

Light, Ann, Gini Simpson, Lois Weaver, Patrick G. T. Healey, and SIGCHI (Group : U.S.). 2009. Geezers, Turbines, Fantasy Personas: Making the Everyday into the Future. in *C&C '09: Proceedings of the seventh ACM conference on Creativity and cognition*. Association for Computing Machinery.

Lim, Catherine Y., Tad Hirsch, Kristine Matthews, and Nancy Hooyman. 2016. *Engaging in Aging: Sustaining Participation in Design*.

Manchester, Helen, and Juliane Jarke. 2022. 'Considering the Role of Material Gerontology in Reimagining Technology Design for Ageing Populations'. *International Journal of Ageing and Later Life* 54(2):181–213. doi: 10.3384/ijal.1652-8670.3531.

McGinley, Chris, Jeremy Myerson, Gerard Briscoe, and Sidse Carroll. 2022. 'Towards An Age-Friendly Design Lens'. *Journal of Population Ageing* 15(2):541–56. doi: 10.1007/s12062-022-09367-5.

Mitchell, J. Clyde. 2011. 'Case and Situation Analysis'. *The Sociological Review.* 31. 187 - 211. doi:10.1111/j.1467-954X.1983.tb00387.x.

Nash, Jennifer C. n.d. *Re-Thinking Intersectionality*. Feminist Review, 89(1), 1-15. https://doi.org/10.1057/fr.2008.4

Neven, Louis. 2010. '"But Obviously Not for Me": Robots, Laboratories and the Defiant Identity of Elder Test Users'. *Sociology of Health and Illness* 32(2):335–47. doi: 10.1111/j.1467-9566.2009.01218.x.

Neves, Barbara Barbosa, Fausto Amaro, and Jaime R. S. Fonseca. 2013. 'Coming of (Old) Age in the Digital Age: ICT Usage and Non-Usage among Older Adults'. *Sociological Research Online* 18(2):22–35. doi: 10.5153/sro.2998.

Neves, Barbara Barbosa, and Geoffrey Mead. 2021. 'Digital Technology and Older People: Towards a Sociological Approach to Technology Adoption in Later Life'. *Sociology* 55(5):888–905. doi: 10.1177/0038038520975587.

Neves, Barbara Barbosa, and Frank Vetere. 2019. 'Ageing and Digital Technology: Designing and Evaluating Emerging Technologies for Older Adults'. *Ageing and Digital Technology: Designing and Evaluating Emerging Technologies for Older Adults* 1–335. doi: 10.1007/978-981-13-3693-5/COVER.

Neves, Barbara Barbosa, Jenny Waycott, and Sue Malta. 2018. 'Old and Afraid of New Communication Technologies? Reconceptualising and Contesting the "age-Based Digital Divide"''. *Journal of Sociology* 54(2):236–48. doi: 10.1177/1440783318766119.

Oh, Suyeon, Young Hoon Oh, and Da Young Ju. 2020. 'Understanding the Preference of the Elderly for Companion Robot Design'. *Advances in Intelligent Systems and Computing* 962:92–103. doi: 10.1007/978-3-030-20467-9_9.

Östlund, Britt, Björn Fischer, Barbara Marshall, Nicole Dalmer, Mireia Fernandez-Ardévol, Andrea Garcia-Santesmases, Daniel Lopez, Eugene Loos, Fangyuan Chang, Xin Chen, Louis Neven, Alexander Peine, Andrea Rosales, and Sanna Kuoppamäki. 2022a. 'Using Academic Work Places to Involve Older People in the Design of Digital Applications. Presentation of a Methodological Framework to Advance Co-Design in Later Life'. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* 12207 LNCS:45–58. doi: 10.1007/978-3-030-50252-2_4.

Oudshoorn, Nelly, Els Rommes, and Marcelle Stienstra. 2004. ‘Configuring the User as Everybody: Gender and Design Cultures in Information and Communication Technologies’. *Science, Technology, & Human Values* 29(1):30–63.

Özsungur, Fahri. 2022. ‘A Research on the Effects of Successful Aging on the Acceptance and Use of Technology of the Elderly’. *Assistive Technology* 34(1):77–90. doi: 10.1080/10400435.2019.1691085.

Patton, M, Q. 1990. *Qualitative Evaluation and Research Methods*. Newbury Park, California: Sage Publications .

Peine, Alexander, Vivette van Cooten, and Louis Neven. 2017. ‘Rejuvenating Design: Bikes, Batteries, and Older Adopters in the Diffusion of E-Bikes’. *Science Technology and Human Values* 42(3):429–59. doi: 10.1177/0162243916664589.

Peine, Alexander, and Louis Neven. 2019. ‘From Intervention to Co-Constitution: New Directions in Theorizing about Aging and Technology’. *Gerontologist* 59(1):15–21. doi: 10.1093/geront/gny050.

Peine, Alexander, and Louis Neven. 2021. ‘The Co-Constitution of Ageing and Technology - A Model and Agenda’. *Ageing and Society* 41(12):2845–66. doi: 10.1017/S0144686X20000641.

Pena, Belen Barros, Rachel E. Clarke, Lars Erik Holmquist, and John Vines. 2021. ‘Circumspect Users: Older Adults as Critical Adopters and Resistors of Technology’. in *Conference on Human Factors in Computing Systems - Proceedings*. Association for Computing Machinery.

Pettican, Anna, Beverley Goodman, Wendy Bryant, Peter Beresford, Paul Freeman, Valerie Gladwell, Cherry Kilbride, and Ewen Speed. 2023. ‘Doing Together: Reflections on Facilitating the Co-Production of Participatory Action Research with Marginalised Populations’. *Qualitative Research in Sport, Exercise and Health* 15(2):202–19. doi: 10.1080/2159676X.2022.2146164.

Pfister, Anne E., Cecilia Vindrola-Padros, and Ginger A. Johnson. 2014. ‘Together, We Can Show You: Using Participant-Generated Visual Data in Collaborative Research’. *Collaborative Anthropologies* 7(1):26–49. doi: 10.1353/cla.2014.0005.

Righi, Valeria, Sergio Sayago, and Josep Blat. 2017. ‘When We Talk about Older People in HCI, Who Are We Talking about? Towards a “Turn to Community” in the Design of Technologies for a Growing Ageing Population’. *International Journal of Human Computer Studies* 108:15–31. doi: 10.1016/j.ijhcs.2017.06.005.

Robinson, Laura, Jeremy Schulz, Grant Blank, Massimo Ragnedda, Hiroshi Ono, Bernie Hogan, Gustavo S. Mesch, Shelia R. Cotten, Susan B. Kretchmer, Timothy M. Hale, Tomasz Drabowicz, Pu Yan, Barry Wellman, Molly-Gloria Harper, Anabel

Quan-Haase, Hopeton S. Dunn, Antonio A. Casilli, Paola Tubaro, Rod Carvath, Wenhong Chen, Julie B. Wiest, Matías Dodel, Michael J. Stern, Christopher Ball, Kuo-Ting Huang, and Aneka Khilnani. 2020. 'Digital Inequalities 2.0: Legacy Inequalities in the Information Age'. *First Monday*. doi: 10.5210/FM.V25I7.10842.

Rogers, Yvonne, Jeni Paay, Margot Brereton, Kate Vaisutis, Gary Marsden, and Frank Vetere. 2014. Never Too Old: Engaging Retired People Inventing the Future with MaKey MaKey. Pp. 3913–22 in *Conference on Human Factors in Computing Systems - Proceedings*. Association for Computing Machinery.

Sakaguchi-Tang, Dawn K., Jay L. Cunningham, Wendy Roldan, Jason Yip, and Julie A. Kientz. 2021. Co-Design with Older Adults: Examining and Reflecting on Collaboration with Aging Communities. *Proceedings of the ACM on Human-Computer Interaction* 5(CSCW2). doi: 10.1145/3479506.

Sanders, Elizabeth B. N., and Pieter Jan Stappers. 2008. 'Co-Creation and the New Landscapes of Design'. *CoDesign* 4(1):5–18. doi: 10.1080/15710880701875068.

Sanders, Elizabeth B. N., and Pieter Jan Stappers. 2014. 'Probes, Toolkits and Prototypes: Three Approaches to Making in Codesigning'. *CoDesign: International Journal of Cocreation in Design and the Arts* 10(1):5–14. doi: 10.1080/15710882.2014.888183.

Sanders, Liz. 2013. 'New Spaces, Places and Materials for Co-Designing Sustainable Futures'. *Current: Emily Carr University of Art Design, Design Research Journal.* 4.

Sattler, Claudia, Jens Rommel, Cheng Chen, Marina García-Llorente, Inés Gutiérrez-Briceño, Katrin Prager, Maria F. Reyes, Barbara Schröter, Christoph Schulze, Lenny G. J. van Bussel, Lasse Loft, Bettina Matzdorf, and Eszter Kelemen. 2022. 'Participatory Research in Times of COVID-19 and beyond: Adjusting Your Methodological Toolkits'. *One Earth* 5(1):62–73.

Schwennesen, Nete. 2021. 'Between Repair and Bricolage: Digital Entanglements and Fragile Connections in Dementia Care Work in Denmark'. *Socio-Gerontechnology* 175–88. doi: 10.4324/9780429278266-15.

Skinner, Mark W., Denise Cloutier, and Gavin J. Andrews. 2015. 'Geographies of Ageing: Progress and Possibilities after Two Decades of Change'. *Progress in Human Geography* 39(6):776–99. doi: 10.1177/0309132514558444.

Sutton-Brown, Camille A. 2014. 'Photovoice: A Methodological Guide'. *Photography and Culture* 7(2):169–85. doi: 10.2752/175145214X13999922103165.

Tsai, Hsin yi Sandy, Ruth Shillair, Shelia R. Cotten, Vicki Winstead, and Elizabeth Yost. 2015. 'Getting Grandma Online: Are Tablets the Answer for Increasing Digital

Inclusion for Older Adults in the U.S.?' *Educational Gerontology* 41(10):695–709. doi: 10.1080/03601277.2015.1048165.

Vines, John, Gary Pritchard, Peter Wright, Patrick Olivier, and Katie Brittain. 2015. 'An Age-Old Problem: Examining the Discourses of Ageing in HCI and Strategies for Future Research'. *ACM Transactions on Computer-Human Interaction* 22(1):19. doi: 10.1145/2696867.

Wanka, Anna, and Vera Gallistl. 2018. 'Doing Age in a Digitized World—A Material Praxeology of Aging With Technology'. *Frontiers in Sociology* 3(April):1–16. doi: 10.3389/fsoc.2018.00006.

Wanka, Anna, and Vera Gallistl. 2021. *Age, Actors and Agency: What We Can Learn from Age Studies and STS for the Development of Socio-Gerontechnology*.

Waycott, Jenny, and John Vines. 2019a. 'Ageing and Digital Technology'. *Ageing and Digital Technology* (January). doi: 10.1007/978-981-13-3693-5.

Waycott, Jenny, and John Vines. 2019b. 'Designing Technologies with Older Adults: Ethical Tensions and Opportunities'. *Ageing and Digital Technology* (2019):173–87. doi: 10.1007/978-981-13-3693-5_11.

Wiles, Rose, Graham Crow, and Helen Pain. 2011. Innovation in Qualitative Research Methods: A Narrative Review. *Qualitative Research* 11(5):587–604.

Willig, Carla. 2017. 'Reflections on the Use of Object Elicitation'. *Qualitative Psychology* 4(3):211–22. doi: 10.1037/qup0000054.

Zamenopoulos, Theodore, and Katerina Alexiou. 2018. *Co-Design as Collaborative Research*.