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# Infrastructuring Value Exchange in Communities Through a Boardgame

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## ABSTRACT

This paper reports on participatory engagements conducted with four post-industrial marginalised communities in Scotland. Our engagements focused on exploring how new forms of “value exchange” between community members might be facilitated and infrastructured. These towns suffer from inadequate public infrastructure, austerity and isolation. These communities still rely on close-knit relationships with neighbours, family and friends to be resilient to these challenges. The research examines informal interpersonal interactions for creating sustained community value exchange. We developed a Monopoly-inspired boardgame called Exchangeopoly to surface, track and quantify these community interactions within the gameplay. Our findings present the boardgame as a tool for infrastructuring existing exchanges and new ways of building social connections and capital within local neighbourhoods. The paper contributes to a better understanding of the process of infrastructuring mutual value exchange and that of re-designing incentivisation through value, to address the issues of longitudinality in volunteer-driven contexts.

## CCS CONCEPTS

• Human-centered computing → Field studies.

## KEYWORDS

Infrastructuring, Co-design, Community Value Exchange, Boardgame, Community Currencies

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## 1 INTRODUCTION

Participatory Design (PD) has been engaging in community contexts since its initial conception, with many of these projects being motivated by an underlying commitment to social and political design. Recent work in PD has aimed to make social and political issues visible, for example, through the creation of publics which centre on the shared struggles within communities [37]. However,

it is well documented that communities are also often fraught with uneven power dynamics and political complexities [19, 36]. Participatory and co-constitutive acts of design in community contexts can help make these often invisible social, political, and material complexities more visible and relatable, to researchers, designers, and community members themselves [1, 11]. Recently researchers have started paying attention to the messiness of informal exchanges in communities that are part of the complex interactions between community members [9, 31] and are often embedded and tacit in nature. In these community settings where complex interpersonal dynamics are at play, PD also has an important role in shaping the trust relationships between community members and researchers, fostering mutual learning and co-realization [56].

The concept of infrastructuring has grown in popularity and awareness across PD in recent years, playing a key role in shaping the field’s understandings of how PD can tap into and surface the “installed base” of communities [24, 34] and draw out less visible, tacit processes. Infrastructuring, as well as involving study and appreciation of the installed base and historical socio-technical practices in communities, also brings attention to how infrastructures might support new practices and long-term collaborative endeavours within community contexts. Karasti [34] highlights how PD engages with infrastructuring in communities through the formation of socio-material assemblages (“things”), or publics at the scale of a community or society, or through the creation of commons-based alternatives to traditional economic systems. A shared quality across these different perspectives on infrastructuring is that all involve the coordination and provision of things, people, resources, skills (and more) to develop collaborative infrastructure for ongoing and future action [24]. However, there still remain relatively few detailed case study examples of the formation of such collaborative infrastructures in communities where a multiplicity of values may be at play, and where both bottom-up and top-down dynamics are influencing the creation of collaborative infrastructures.

In this paper, we discuss a project conducted in four different neighbourhoods across Scotland. The locations we worked in were post-industrial towns and urban conurbations and had similar austerity issues, such as financial deprivation, limited access to information, amenities and resources, reduced public transport connectivity, and high unemployment. Moreover, all the communities reported experiencing a perceived decline in social connectedness between community members, which for some members was felt to be an enduring effect of the COVID-19 lockdowns. As such, in these communities, there was significant interest from residents and organisations based in them, in establishing new initiatives to start re-connecting the community and to enable new forms of



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social bond-making and capital. Our involvement in this came from working with one of the organisations based in these communities, a residential care and social housing provider. Our project partner was initiating the development of new forms of collaborative infrastructure within these different places to form better connections and “help one other more”.

Over a period of 12 months, we used iterative design techniques considering the larger milieu of austerity politics to understand existing forms of support, help and volunteering that exist in these communities. Building on this, we then set out to explore how new formal collaborative infrastructures that support and sustain “value exchange” between community members could and should be established. For the project, we defined value exchange as a form of reciprocity between people living in these communities which are not inherently financial. This might include the exchange of skills, time, tools, resources, and other forms of reciprocity to help people in need and to provide support. Inspired by examples of sustainability communities [31] using alternative and complimentary currencies<sup>1 2</sup>, our partner was also interested in how such value exchanges might be sustained in the long-term by establishing hyper-local currencies or tokens that represented and rewarded reciprocity. With this as our backdrop, our work considered two driving research questions: 1) *How can PD activities and methods infrastructure mutual value exchange and trust in austerity affected communities?*, and 2) *What are the considerations for designing collaborative socio-technical infrastructures that incentivise and longitudinally sustain reciprocity and the exchange (of skills, time, resources) in these communities?*

In the paper, we give an overview of the project, but focus in detail on a series of PD workshops that used a boardgame we designed - called Exchangeopoly. Exchangeopoly set out to playfully explore with community members scenarios and situations where value exchanges between local residents are proactively initiated by a platform, then tracked, quantified and rewarded. Through its gameplay, Exchangeopoly supported participants in describing experiences of existing and historical forms of exchange, volunteering and kinship in their communities, and the factors they perceived as influencing their decline. The gameplay scaffolded discussions about relational forms of trust between community members, and an unwillingness to be co-dependent on local people, and how both of these might inhibit or mobilise collaborations between community members. Furthermore, the gameplay helped explore the design of collaborative infrastructures that are underpinned by community tokens, and the potentially negative and positive impacts of digital platforms and tokenised incentive systems in regards to sustaining value exchanges over time. In reporting the findings from these workshops, we contribute insights for PD researchers and practitioners who are engaged in fostering the formation of collaborative infrastructures in communities. In the context of collaborative infrastructuring processes being commonly utilised by states and non-profit organisations as a top-down response to precarity and austerity, we highlight the complex social dynamics in communities that mean such initiatives are very hard to instigate

in practice. Through this, we contribute a deepened understanding of how PD activities, like the Exchangeopoly workshops, can act as resources to mobilise the initial formation of collaborative infrastructures, and how understanding trust, co-dependency and pluralistic notions of value are critical to enabling collaborative infrastructures in communities to flourish.

## 2 RELATED WORK

### 2.1 Austerity, volunteering and trust in communities

Our research was situated in the context of collaborating within communities that had been on the receiving end of “austerity politics” [8] and associated reductions in state and local government funding for public services and community infrastructure for nearly 15 years. Communities and community organisations have for some time been finding creative ways to counter austerity and shrinking resources [18, 22, 61]. The deterioration of living conditions and deep distrust of political institutions have led citizens to take the “matter into their hands” [17], through social participation, self-organization and solidarity economies [53, 61].

Volunteering is one such activity performed within resource limited communities towards poverty alleviation through collaborative action. Monforte explains that compassionate action, when mixed with social and critical resilience, can create hybrid forms of engagement resulting in empowerment processes in resource constraint communities [44]. Volunteering is known to instil a sense of feeling close to others and experiencing relatedness [58]. People who engage in volunteer activities often categorise it as gifting and do not want anything in return for their work, time or skills. It is also known to benefit the volunteer [58] through social and emotional ties built during engagements [63] by encouraging connection and wellbeing among community members [50]. However, volunteer work can be seen as unpaid labour [23] and has also been reported to create burnouts, with members eventually withdrawing from the community organisations they may volunteer for [9]. Furthermore, previous literature emphasises the amount of emotion work needed within community engagement [20, 60] and volunteer management [33], often necessitating the use of digital technologies for supporting volunteering and community work [59].

In addition, volunteering has shown the potential to build social capital and strengthen civil society by generating trust and facilitating the effective organisation of people and collective action [52]. Benevolent acts such as volunteering help to reconcile divergent ideals and goals [50], and establish mutual value exchange [49] through acts of trust-building [62]. Trust-building is an important element in interpersonal relations within communities when working across differences in values, political viewpoints and socio-economic differences. Trust is often considered as an implicit aspect within community-based work, especially in politically sensitive participatory and co-design research for distributions of power, equitable collaboration and interpersonal exchange essential for longitudinal impact in community settings [3, 39, 42]. Previous literature has focused on its role in building societal relations and navigating distrust towards institutions fostering community-led action [12].

<sup>1</sup><https://www.wired.co.uk/article/local-currencies-dead>, accessed on 8th October 2023

<sup>2</sup><https://www.bbc.com/worklife/article/20200427-how-community-currencies-help-keep-businesses-afloat>, accessed on 8th October 2023

PD has also touched on the relationship between researchers and community members, and building trust gives researchers and designers permission to design within precarious contexts [21, 39, 62]. Trust-building is a prerequisite in designing along with community organisations and enabling long-term impact [64]. Clarke et al. (2018) highlight the importance of materials in negotiating the interdependencies of trust in such contexts. They also examine how distrust can be navigated, and trust can be supported through sensitive socio-material exchange [21]. In our research, our PD activities set out to surface the relationship between socio-material trust and informal value exchange within communities that are experiencing limited or precarious access to information or other resources.

## 2.2 Alternate exchanges and currencies

Local communities have been working to create systems of exchange since the dawn of humanity. Economic value is often defined by market logic, whereas social regimes of value often incorporate moral or cultural criteria of worth, as is the case with reciprocity or gift exchange [43]. Alternate local currencies that act as a hybrid of economic and social value and monetary worth have made their mark in the last two decades, encouraging the localised exchange of value and goods [31]. Local currencies often run parallel to the mainstream currencies with their value equating to the same, but with specific criteria associated with their use; for example, in the UK, there are numerous local currencies<sup>3</sup>. There are also other innovative ways developed to bypass any monetary exchange much in line with acts of kindness and volunteering, for example, through crowdsourcing, barter and time exchange [38]. For example, time exchange establishes norms of reciprocity and mutuality in a community in a localised form [33]; however, these forms of exchange have also been criticised for being generalised and not addressing the diverse motives of people contributing their time to volunteering [13, 33].

Related to the formation of alternative local currencies are Local Exchange Trading Schemes (LETS). LETS tend to be geographically localised and democratically governed organisations and non-profits that support the informal but coordinated ‘exchange of goods and services within a group’ [4]. They are based on proximity and reciprocity and are promoted as initiatives with a potential for local economic development [4] and provide mutual aid to those experiencing precarity and poverty. Typically, LETS establish their own local complimentary community currency as an alternative to national or fiat currencies, and by coordinating members of a local community in the pursuit of objectives that often combine economic, social, community, ethical and environmental goals [55]. Cabitza et al. describe these schemes as joint and social actions [15] that are ‘a response to the local social and economic consequences of globalisation and capitalism’ [55], and as a resource for the development of ‘areas suffering from a shortage of cash where untapped capacity is accompanied by unmet needs’ [55]. LETS are thought to be a potential solution to growing inequality and a sense of social exclusion in society [30]. They are often regarded as the exchange of services usually referred to in terms of Time Banking systems [15].

Time Banks have a long and complex history; however, contemporary understandings of them are often attributed to the work of Edgar Cahn in the 1980s, where Time Banks were defined through frameworks of reciprocal exchange where time, or effort, is a unit of currency in which one hour of service (any service) is equal to one hour of any other service available by its members<sup>4</sup>. Cahn states that Time Banks and their currency-in-trade, “Time Dollars”, are ‘designed to rebuild a fundamentally different economy, an economy of home, family, neighbourhood, and community - the Core Economy’ that runs side by side to the world of commerce [16]. Time banking has been used in Japan since the early '90s for elderly care, with members working as carers and collecting time towards their own old age [32]. However, time banking has been known to have challenges, including managing risk, safeguarding people and information, associated bureaucracy, and the complexity of the time bank administration requiring adequate resources [45]. It also faces institutional structural issues such as time token circulation troubles, and difficulty capturing and then trusting data that accounts for peoples’ exchange of time.

In recent years there has been an emergence of alternate ways of creating value exchange through digital domains, which in some cases are decentralised or peer-to-peer [27, 41]. The research community has been looking at the digital sharing economy as an emerging area of study [25], for example, ridesharing, and crowdsourcing systems. The sharing of resources and assets drives these systems. However, they are still based on the exchange of dominant currency [47] and are typically embedded with neo-liberal agendas and market dynamics. In this paper, we delve more deeply into how digital tools and platforms might be part of socio-technical collaborative infrastructure in communities facilitating forms of value exchange akin to LETS and time banks.

## 3 PROJECT CONTEXT

As noted, our project involved collaborating with members of four post-industrial neighbourhoods in Scotland (see figure 1), each experiencing challenges related to reduced investment in local infrastructure, limited local employment opportunities, and perceived increases in social isolation and exclusion. These neighbourhoods have also historically been predominantly formed of white Scottish residents; however, in recent years, they have seen an influx of mixed ethnicity population through both economic migration and as a result of the neighbourhoods hosting refugee populations in social housing. There was recognition that, in general, the changing demographics of the neighbourhoods had increased disconnections and division thus reinforcing the sense of community fragmentation. Though disheartened by the difficulties that their communities face, many of the community members we met during the project remained positive and open-minded to new interventions that could support the creation and exchange of value and values.

Our initial engagements with the communities were facilitated by our project partner, a residential care and social housing provider in the communities we worked in, that was responsible for hosting and organising a range of other public events and volunteer projects in each locale. At the start of the project, we relied on our partner’s

<sup>3</sup><https://www.wired.co.uk/article/local-currencies-dead>, accessed on 8th October 2023

<sup>4</sup><https://timebanking.org/>, accessed on 8th October 2023



**Figure 1: The neighbourhoods**

relationships with community members and their pre-existing volunteer groups for recruitment. The intent was to build, sustain, and grow our partner's existing relationships with community members, which would lower barriers to research engagement. However, it became difficult to recruit and retain participants at various points in the project. From conversations with our partner and with participants during the course of our 12 months on the project, we started to see that much of the volunteer work in the communities was driven by a relatively small number of engaged individuals - and there was significant volunteer burnout amongst these community members. These volunteers found it difficult to help others see that they too might have the skills, abilities, or resources to offer, and thus grow the volunteer base in the communities. In addition, there were tensions because the project was led by the project partner and our university rather than by a community-led initiative. Over time, these three core tensions - around burnout, valuing skills and assets, and the project negotiating between of grassroots and top-down coordination - became embedded in our work.

Our approach to exploring value exchange in these communities was underpinned by the use of design engagements to understand the social phenomena of offering and receiving help. We conducted a series of design engagements and workshops over a period of 12 months, which iteratively built on one another. These engagements were conducted with community organisations and local residents in the four locations to surface existing practices of value exchange and explore new collaborative infrastructure. Our first engagements were workshops in each location with residents, as well as staff and volunteers at our partner organisation, where participants mapped the communities with us and created a 'Help Wanted' notice board representing unmet help and needs in their community. These were primarily sensitising workshops for us and for key local stakeholders - enabling us to better understand the configuration and dynamics of each location, and for participants to familiarise themselves with to some initial qualities of value exchange. After this, we ran a "pop up" design activity called the 'Value Exchange Scales' at public community events (see figure 2). This activity was a set of weighing scales built to allow participants to assign weights to different acts of kindness that occur within their community. By

assigning different weighted blocks to these jobs, participants were able to visualise the ideas and principles of value exchange and to discuss the value and impact it might have on the community. Residents who engaged in the activity found it hard to define one job as being worth more than another - recognising value was subjective and pluralistic - and preferred instead to consider any act of kindness and help as of equal value.



**Figure 2: Value Exchange Scales and Community Probe.**

Our third activity was a Community Probe, an activity pack designed in continuation with the scales but intended to reach a wider number of residents in each community by mail (see figure 2 for reference). The pack had 3 probe elements inside in the form of cards: a task asking residents to create a list of ingredients to form a community with; community wishtags for things they would like to receive help for; and seeds of kindness for things they would like to give to the community. The three activity cards gave insights into tangible and intangible things that people would like to give and receive in their communities. The probe pack also had perforated tokens within each card as a "thank you" for taking part and giving their time for the project. The participants were instructed to drop off their completed probe packs and the tokens at a local community space. At the community place the members could use their token to "vote" on how they would like to "spend" the tokens: "spend it on services in the community"; "redeem an hour of service or hire"; "as payment for a job or task"; "to donate to the community to use"; or "to gift it to someone else in the community". With the tokens, we intended to explore what participants might appreciate as a form of a reciprocal exchange, in this case for helping us with the project by completing the probe.

#### 4 EXCHANGEOPLY: DESIGNING THE BOARD GAME ACTIVITY

Building on the above, we next decided to explore more in-depth with participants scenarios and situations where socio-technical tools and platforms are enabling people in their community to place requests and make offers of help, and where exchanges between people are tracked, monitored and rewarded but in yet-to-be-defined ways. We designed these next set of engagements as workshops that involved playing a board game we had created for the project. Prior research has demonstrated how games can be used to support the creative exploration of future scenarios with participants as part of ongoing design processes [6]. They have also proven to be a playful way of eliciting rich engagement with participants within community contexts [18] and, as a design method, allow

participants to engage in complex and sensitive matters while being framed in a lighthearted and approachable way [10].

Exchangeopoly is the board game we created for the workshops. As is evident from the name, the game is built on the mechanics of Monopoly. The foundations of the boardgame were based on the overarching themes of the previous three community engagement activities we conducted earlier in the project. Designed as a reflective participatory tool, Exchangeopoly was intended to elicit rich conversation and debate around different forms of value exchange that exist or could exist within the communities we were collaborating with. We also chose Monopoly for the game’s structure as it is a commonly known cultural reference point that many people in the UK are aware of, even if they have not played the game before. As it happens, most of the participants were familiar with the game and identified as having played it as a child, making it easier for them to understand the game mechanics.

At first, one may think it to be detrimental to use Monopoly as the basis for the board game due to its underlying tones of capitalism and consumerism, as replicated in most zero-sum games. Instead, ‘Exchangeopoly’ is built on the collaborative ethos that aligns with the original iteration of Monopoly designed by Lizzie Maggie [48]. Maggie’s original version of the game was called ‘The Landlord’s Game’, a practical critique and cynical demonstration of how the economic system exploits the many through land ownership; notions that were inspired by the theories of American economist Henry George [29]. Although the ‘Landlord game’ is placed within a real estate context, Exchangeopoly looks to evoke and elicit conversations around the well-being of community members and the different forms of value exchange that could and should exist in a community context to build healthy and resilient community neighbourhoods.

The board game went through a series of iterations of mechanics and aesthetics; through early test runs and a pilot, we were able to work out the fundamentals of gameplay, scenarios, and exchanges within the game. The design language of the board game was developed to evoke familiarity and community connectedness through hand-drawn graphics and a subdued colour palette.

### 4.1 Game Mechanics

Exchangeopoly asks the participants to play out scenarios as themselves or as someone within the community who they might know. The scenario used to initiate the participants in the game was that for the community to function and become a ‘happier, healthier neighbourhood’, players must share and exchange their time, skills, interests, expertise and assets. In doing so, players will be rewarded with ‘community tokens’ that they can spend throughout the game. Community tokens are earned if players choose to accept a job when they land on a house. Players can then spend the tokens they have earned throughout the game - e.g., to gain access to someone else’s skills, or to donate to community projects (see figure 3 for the boardgame and the card deck).

Each participant plays to be a part of the community and works together with other participants; when a participant takes a turn and moves around the board, they may be asked to help someone in the community, asked if they need help, or be put into a dilemma that they need to resolve with other participants. Each square on the board has a different icon, linked to a card that the participants pick up. An ‘Ad for help’ card is someone in the community offering help with their skills and time; a ‘House’ card is someone in the community who needs help; a ‘Dilemma’ card is a scenario that may occur in the value exchange system and the group has to discuss how they would go about solving it collectively; and the ‘Community event’ card gives examples of local events or activities that they could contribute or donate tokens to.

The cards introduce different scenarios and after some time, blank cards are introduced to let participants write their own scenarios focused on how they can receive or offer help to their community. Through these discussions, participants navigate exchanges within the community and how they might accept (or reject) or offer (or refuse to offer) help within their community. It also invites other players to collaboratively make decisions, and suggest how these exchanges would work in the real world. To win as a community, players must work together to support as many people as possible in the community and collectively players must accumulate 30 interactions (typically this takes 1-2 hours of playtime).

### 4.2 Exchangeopoly Workshops and Analysis

Locations	No. of participants	Workshops conducted
Stanton	6 participants	1
Candor	3 participants	1
Beltin	Workshop 1 - 4 participants Workshop 2 - 4 participants Workshop 3 - 3 participants	3
North Bay	5 participants	1

Table 1: Details of the workshops



Figure 3: Boardgame and the card deck.

We conducted a series of workshops (see figure 4) in all the locations with a minimum of three participants per location (see Table 1 for details). The participants were between the age group

of 19 - 80 years old, the majority of the participants being retired and within the age bracket of 60 - 80 years.

All of the workshops were audio recorded and documented with photographs as appropriate. The audio recordings were transcribed, on which we conducted thematic analysis [14]. In the following sections, we report on the findings across these workshops, highlighting key findings about the opportunities, challenges, and ways forward for supporting and promoting value exchange in these communities.

## 5 FINDINGS

Our findings present the board game as a tool for infrastructuring existing exchanges and new ways of building social connections and capital within local neighbourhoods.



**Figure 4: Participants playing the boardgame during the workshops.**

### 5.1 Asking and Receiving Help: Establishing Networks of Trust

Exchangeopoly purposely set out to explore the social dynamics of asking for, giving, and receiving help in communities. An assumption built into many volunteering, time banking, and local exchange schemes is that people are willing to engage in exchanges with anyone within their community. In value exchange, an assumption is that people would be happy to give and receive help from others in their local community, regardless of whether they were known to them or not. It was noted that throughout the play of Exchangeopoly, the main barrier to exchange was not the lack of match between requests for help and the perceived skills, time, and resources of participants instead, it was a lack of knowledge about the context of help requested. Participants voiced concerns about the trustworthiness of others within these interactions they wanted to know who was requesting help, why they needed the help, and who else in the community they might already be connected to. A byproduct of knowing more about someone's context, helped participants evaluate the level of commitment, time, and work involved in the task. Participants felt that knowing this information would make them better placed to offer the necessary skills and experiences to help someone, or perhaps recommend someone else who did.

Most of the participants were older adults, and it was apparent that amongst these participants there was some inhibition to trust "strangers", even if they had lived in the same neighbourhood as

them for several years. There was a preference for in-person interactions before agreeing to help another person. Such face-to-face meetings would enable them to get to know the person before they accepted any acts of kindness or offer one in return. Several participants said they would only trust 'strangers' if they came with strong recommendations from people with whom they already had a trusted relationship. Furthermore, the dominant concern was how these initial connections were made, and trust was built between members. For example, as voiced by a participant, "*it would depend on how one would meet someone in the first place*" - Rosie. Participants explained that interacting and knowing more about someone is essential for letting them into their homes or doing a job for them. Furthermore, when offering help or volunteering, they often expressed the need to be in charge and choose what they would be doing, as explained by a participant.

*"I want control over my own volunteering. So, I want to know who I'm seeing, what I'm doing, and I don't particularly want to put my name in a box, and potentially get picked up by anybody, and somebody I don't know"* - Penny

The notion of needing to know someone before offering to help them, or to accept an offer of help, also posed challenges. However, many participants recognised that an underlying motivator behind the game and the wider project was to enable new forms of social connectivity and participation among community members, especially those new to a neighbourhood or experiencing social isolation. However, if participants were only likely to trust people already within their social network, this would likely fail to address these issues. Similarly, if we were to assume those who are isolated or new to a community might also have concerns around trust, then it would be unlikely they would suddenly trust a community initiative such as value exchange. In discussing situations like these through Exchangeopoly, participants highlighted the importance of direct participation of gatekeeper organisations (like local charities that may work with different populations within the neighbourhood) who would validate identities and advocate requests and, if needed, offers their skills and resources. This would be supplemented by making visible, the social connections people in the community have around these organisations and where there might be mutual friends or relations in that community. For example, if someone wanted help walking their dog, especially during wetter and colder days of winter, they may be willing to accept help from a local stranger. However, to do so they would want to know if the person was from the neighbourhood, if any of their friends knew them, and if any of them could validate any prior experience. Such details from the community about personal connections and completed jobs can be used to support claims, ratings, and reviews.

Therefore, building networks of trust and connections are important aspects of value exchange essential in forming collaborative infrastructures within communities. Especially, how people who are unknown to each other in the local neighbourhood are introduced to one another for them to be able to support each other.

## 5.2 Fear of Exploitation and Co-dependence: Navigating Independence

As noted, our workshops were mostly attended by older adults (albeit not exclusively) who were living alone and often reported feelings of loneliness but were still quite engaged with the community. They expressed value in being independent and self-sufficient rather than asking for help. They wanted to do their daily chores, live independently, and not rely on carers or family members. These considerations often deterred them to ask for help from others. However, the participants voiced that people around them felt pressured to offer help even when they did not want the support. One of the participants explained that she would like to learn how to operate her phone herself, rather than her grandchildren taking over.

*“Whether you like it or not, whether you need it or not, people are gonna help you. It’s like having a 14-year-old to tell you how your phone works... Show me how to do it, let me do it. No Nana, I’ll be quicker, let me do it. It drives me mad” - Sherene*

Such discussions instigated a perceived intergenerational gap experienced by the older participants. Surfacing the need to self-organise and learn together rather than having someone just complete a task for them. They wanted to learn with others, be co-independent rather than co-dependent in their tasks, and meet others for social company, rather than depending on them to do a job. Furthermore, within these conversations, they reflected that they require support with chores unable to perform themselves, for example, small tasks around the house like changing curtains, gardening etc. However, they still wanted to ensure these were done together with people, rather than more transactional ‘jobs to be done’.

Moreover, within these discussions surrounding offers for help from others, the older participants explained how they had been taken advantage of, in the past. This was especially true when dealing with larger organisations that often had no local branches or offices to visit, making it impossible to talk to someone face-to-face. Comparatively, local and small businesses were seen to be personally approachable, although again there was much reference in the discussions to local “rogue traders”. Therefore, they often described themselves as being part of the vulnerable population and had to watch out for themselves as they felt targeted. One of the older participants described that they loved to talk to people, but it often leads to sharing too much information which puts him in precarious situations. Even when he really needed help from someone, there is precariousness in the situation and trusting people for him has been difficult.

*“Sometimes it’s really difficult to deal with [place] council about housing benefit or council tax (...) I need to know what her credentials are (...) she might be a nice lady but underneath you don’t know, like [Sherene] said we are a bit targeted” - Garry*

Some participants had recently lost partners, they had heavily relied on them to complete certain tasks and household chores. These participants found it difficult to navigate such situations by themselves as they did not know how to go about doing these tasks. Charles told us about not being able to make certain decisions in

his day-to-day life, as his wife used to make those decisions for him. Loss of partners within the ageing population of these communities was a general concern because of the codependency on partners to fulfil specific domestic tasks. After their passing, they are left feeling lonely and vulnerable and are looking for company which can often be precarious. Participants felt that if they relied on other people or showed these vulnerabilities they could be taken advantage of. Feelings of vulnerability, situations of co-dependence and life transitions need to be understood and navigated in a community setting to create independence rather than codependence within its members. Each member of the community makes a whole, and it is essential to understand the needs and build mechanisms to cater to each one of them by creating safe spaces.

## 5.3 Tension Between In-kind and Monetary Exchanges: Tokenisation of interactions

Exchangeopoly was heavily inspired by Monopoly, and while it reframed this as collective action it still included the collection of “tokens” to represent value exchanges between participants and promote further exchanges through the use of the tokens. The game worked on the tokenization of simple, small acts of kindness or informal volunteering roles that participants exchanged during the gameplay; for example, receiving a token in exchange for dog walking was seen as a helpful incentive. Many participants explained that incentivised interactions and exchanges would encourage members to become more connected and involved within the local community. However, a smaller number felt that the use of tokens as incentives for completing a job took away from the ethics and morals of volunteering and acts of kindness. It was a contested interaction; some players wanted a token for completing a job and saw this as a means to grow the number of people engaged in the community, and others felt it ignored the less tangible benefits of offering help - as explained by Christine:

*“I quite enjoy going out for a walk, and it’s nice to do a walk for a purpose. So, yeah, that’s a maybe. Would I want anything back for it - no, because it would be out in the fresh air, and exercising.” - Christine*

The token, at times, was compared to monetary compensation, which was thought to be devoid of the spirit of volunteering and community work. However, for some participants, the idea of getting a token in return for completing a task also meant that they could use it for something in return. They discussed the idea of spending, and how saving tokens could be a useful way to help alleviate financial pressures in the current economic climate. For example, some thought tokens to be like supermarket points or memberships that they could use in different shops or services, perhaps limited to the local geographic area. One group of participants discussed friends in the neighbourhood who were relying on state welfare benefits and were not allowed to work but could volunteer. These tokens could provide a complimentary form of income through acts of volunteering which can be exchanged to receive help from others. Additionally, participants saw significance of using the tokens to support local businesses and shops in their area rather than supermarket chains. Furthermore, this suggested that the value of a token may be defined in collaboration with these

businesses. For example, tokens may grant the shopper discounts on selected items, rather than simply replacing currency.

Understanding the value of a token and its worth in comparison to fiat currency was an important topic of discussion during the workshops. The tokens were often compared to time banking schemes; in this instance, one hour for a job is worth one token. Moreover, within these complex discussions on value and worth players began taking on personas of different people in the community, one such instance was of a younger person. This was often the persona of their own children and thought the token system to be beneficial. They saw the tokens as not only an incentive for the younger generation to get involved within the community but also a way to build transferable skills.

*“I see my daughter could later add [skills] to her CV (...) these [tokens] can be used as savings for and put them towards something she would want to buy” - Martin*

Moreover, these tokenised exchanges within the game surfaced discussions on how participants in a value exchange system would avoid getting exploited by those who may refuse to pay or do a job without any returns. For instance, drawing of a Dilemma card where someone refused to transfer a token after completing a job led to the suggestions for automatic and autonomous digital transfer to avoid such instances. During the span of workshops, participants were also given a final activity which was to decide how they would collectively want to spend the tokens that they had contributed towards the community chest in the game. Participants often felt that different charities, services or underdeveloped areas of the community needed the tokens most and would be good places to use the community chest. They suggested taking money out of the community chest to support bills, especially over winter, would be a fair and just way of making sure community funds would best support those in need. However, at various points in the discussions, participants agreed that people find value in different causes, so it's difficult to pinpoint the most valuable asset in the community. Therefore, they wanted to democratically decide where to spend the tokens but be able to track and know-how, who and what it would benefit within the community.

## 6 DISCUSSION

### 6.1 Infrastructuring mutual value exchange

Community work in PD has been at its core since its inception [26]; however, being able to sustain it over longer durations has been a rising concern in the recent past [11, 34]. This points to the importance of infrastructuring in PD processes, where intimate tacit interactions relate to the wider complexities of the community. In our research, the boardgame helped create space and open dialogue considering these tacit relationships within the community, which depend on the range of stakeholders, actors and infrastructures in the neighbourhoods. During initial engagements, it was evident how the community members were trying to build self-sufficiency and resilience. Especially considering the larger social and economic uncertainties in their local neighbourhoods participants were addressing adversity and austerity through volunteering and acts of kindness. We tap into these early stages of the infrastructuring process of the communities, but our focus was on understanding the implicit relationships and interactions between the community

members. The gameplay brought forth the installed base [24, 34, 35] highlighting the complexities that underpin connection, intentions and interactions among the members. Thereby, exposing existing concerns and problems within the mutual value exchange between community members.

Previous PD research focused on infrastructuring, has sought to surface community values, intending to use this understanding to make a network of relationships within the communities visible [7, 24, 51]. In relation the boardgame was a tool to surface community interactions, highlighting the intricacies around asking and receiving help from others. These interactions have considerations and complexities which are often not talked about in community-focused research, in place presenting successful outcomes [3, 11]. These can be related to building trust between members and also with researchers, which informs the building of social capital and, eventually, mutual exchanges. Throughout the research engagement at various stages, we have faced recruitment issues which are related to participant burnout, fear of exploitation or mistrust [9]. These are often not reported in research to present successful sanitised versions [40]; however, when working in complex community contexts, these issues become important to reflect and navigate for emotion work [20, 60].

In our research, trust is an integral part of care, belonging and exchange [21] for making new connections in the neighbourhood. The community members often found it difficult to trust because of their previous negative experiences of being taken advantage of, thus, leading to feelings of loneliness. They have a need to be resilient, and independent however, fear of exploitation impacts the creation of networks of trust beyond what they have at the moment. Therefore, interpersonal trust should be built through existing, established social structures and acquaintances rather than community recommendation systems. Making it important to create new ways of building connections between members, future stakeholders and existing infrastructures.

Furthermore, the boardgame, as a tool to surface these complexities, presented opportunities to meaningfully support exchanges to create long-term place-based outcomes. The boardgame was able to make connections visible [42] and frame them as opportunities within the discussion. For example, participants discussed what is available in each area, what members can do and how they can take part in the local area. Providing place-specific discussions and undertakings that can help in building social connection and cohesion within the community for longitudinally sustaining engagement. It is a persistent issue within community contexts to sustain engagement over a longer time scale because of changes that naturally occur over time, like the inclusion of new stakeholders or existing members leaving due to life changes [9, 23]. Infrastructuring through the creation of support mechanisms can help include and retain members and volunteers, for example, by training younger community members to create partnerships with existing organisations. Prior research has evidenced that socio-technical systems can help communities and their members towards these concerns and create connections to place and people for mutual exchange of value and values. Built-in trust throughout the socio-technical system can address security and liability issues, thereby creating trust.

## 6.2 Re-designing incentivisation through value

As seen in our research, value was being created and shared through exchanges among the community members. Volunteering is a way of exchanging value among members in kind [58] without any promised returns [23]. These volunteer motivations can be numerous [13, 33], but in our research, these are informed by austerity and resource constraints faced by the communities. Even after these concerns, participants described that they feel compelled in the community to help others without the need to get anything in return. The introduction of tokens in the gameplay much like Monopoly as an incentivisation to these exchanges was either declined or looked at as new opportunities for value creation in the neighbourhoods. Participants often equated the token to a currency with monetary worth and did not accept it for themselves, they thought it wise to contribute it towards the community chest. These interactions and exchanges were in line with Maggie's intended use of the game to create cooperation and critique the dominant economic system [48]. These instances were able to encourage participants to reflect and think beyond the existing ways of value exchange within their communities and imagine alternatives like an additional income for people who are on benefits. It was also looked at as a way of inviting groups or stakeholders who are not already part of these interactions. For example, participants wanted to use tokens or incentives to help encourage youth and non-members to participate in acts of kindness. This could be a way to tackle the current issues of intergenerational exchange within these communities. Incentivisation can also be fruitful in keeping up motivation [5, 59], dealing with financial insecurities and building a more robust local economy [31], which is necessary for resource-constrained communities [22, 61].

Therefore, it is to recognise that incentivisation holds different value and values for each person and community. For this complex socio-material and economic exchange, we propose drawing on the idea of value constellations, to look at value creation through a network of social and environmental connections [46]. Speed et al. build on this idea to talk about value creation through Design-calling for a better understanding of how feedback from user communities affects the value of a product or service. However, such opportunities require a reframing of what designers think they are designing – not products, not services, but the propagation of value [28, 57]. This leads to a rethinking of socio-material [21, 42] and technological interventions [27, 41, 59] in community settings that can play a role in creating longitudinal ways of creating social connection and cohesion through value creation. Here we would like to bring in the considerations of designing in constellations [7] in PD work, which looks at a "constellation" of participatory activities that sustains engagement by combining physical and digital flows [7]. Designing incentivisation as a way of value creation can help with considerations of retention and uptake by residents especially when research partners leave the projects in the communities.

## 7 CONCLUSION

The PD community has been increasingly reflecting on and acknowledging the hidden and harder to articulate reporting of the messy conflictual dimensions unfolding through PD processes [3,

11]. Returning to our research questions, we saw how our PD activities were able to surface and scaffold discussions around the complexities of interactions and exchanges between community members. Exchangeopoly as a game enabled participants to grapple with the messy reality of, at once, wanting to promote community action and to grow opportunities for people which included being kind to one another and to help each other out. However, at the same time, deal with mistrust of "others" and what their intentions for helping another person out might be. Trust was experienced as relational and underpinned by historical interactions in the community that provided context in understanding not just what someone needed help with, but why they might need that help. The nature of what might incentivise people to participate in collaborative infrastructuring is also pluralistic; some are driven by a desire to help, others by a need to demonstrate the development of skills, and as a means to access the skills and knowledge of others. It demonstrates that collaborative infrastructures need to invoke multiplicities of value and values, and require socio-technical systems that are flexible in practice. Therefore, requiring the socio-technical systems to represent forms of value by the richness of exchanges between people. Furthermore, trust is fostered in diverse ways, the common pitfalls of digital platforms result in social bubbles or transactional relationships which need to be carefully navigated around.

We acknowledge that mutual value exchange is a vast domain that needs future research and for this, the research processes have to be designed to make visible what is not visible [42, pg. 174], especially related to organisational structures. Therefore, there is a need to initiate accessibility, understandability, transparency, and reputation within research practice, thereby, building trust. Manzini brings into focus the significance of these socio-material structures in contexts where historical partnerships or shared values in communities can not be taken for granted [42]. These considerations open up dialogues for reconfiguring methods with care in research and design [54]. This is especially true when working in politically charged or resource-deprived contexts [2, 7, 40], which require navigating politics, intra-community conflicts, agnostic deliberation, and trust building [18]. These tacit dimensions within research in community contexts are often not reported, and perhaps as a consequence, many reported projects tend to portray a relatively unproblematic narrative of success. This paper has attempted to present an example of the conflictual and contradictory dynamics that occur in the processes of re-initiating and forming collaborative infrastructures in communities.

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## REFERENCES

- [1] Shana Agid. 2016. "... it's your project, but it's not necessarily your work..." infrastructuring, situatedness, and designing relational practice. In *Proceedings of the 14th Participatory Design Conference: Full papers-Volume 1*. 81–90.
- [2] Yoko Akama and Tania Ivanka. 2010. What community? Facilitating awareness of 'community' through Playful Triggers. In *Proceedings of the 11th biennial participatory design conference*. 11–20.

- [3] Yoko Akama and Ann Light. 2018. Practices of readiness: punctuation, poise and the contingencies of participatory design. In *Proceedings of the 15th Participatory Design Conference: Full Papers-Volume 1*. 1–12.
- [4] Theresa J Aldridge and Alan Patterson. 2002. LETS get real: constraints on the development of Local Exchange Trading Schemes. *Area* 34, 4 (2002), 370–381.
- [5] Kerstin Alfes, Bethania Antunes, and Amanda D Shantz. 2017. The management of volunteers—what can human resources do? A review and research agenda. *The International Journal of Human Resource Management* 28, 1 (2017), 62–97.
- [6] Stephanie Ballard, Karen M Chappell, and Kristen Kennedy. 2019. Judgment call the game: Using value sensitive design and design fiction to surface ethical concerns related to technology. In *Proceedings of the 2019 on Designing Interactive Systems Conference*. 421–433.
- [7] Karl Baumann, Benjamin Stokes, François Bar, and Ben Caldwell. 2016. Designing in “constellations” sustaining participatory design for neighborhoods. In *Proceedings of the 14th Participatory Design Conference: Short Papers, Interactive Exhibitions, Workshops-Volume 2*. 5–8.
- [8] Craig Berry. 2016. *Austerity politics and UK economic policy*. Springer.
- [9] Aksel Björn-Hansen and Maria Håkansson. 2018. Building Momentum: Scaling up Change in Community Organizations. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–13.
- [10] Mark Blythe, Jamie Steane, Jenny Roe, and Caroline Oliver. 2015. Solutionism, the game: design fictions for positive aging. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems*. 3849–3858.
- [11] Susanne Bodker, Christian Dindler, and Ole Sejer Iversen. 2017. Tying knots: Participatory infrastructuring at work. *Computer Supported Cooperative Work (CSCW)* 26, 1-2 (2017), 245–273.
- [12] Rachel Botsman. 2017. *Who can you trust?: how technology brought us together—and why it could drive us apart*. Penguin UK.
- [13] David Boyle, Sherry Clark, and Sarah Burns. 2006. Hidden work. *Co-production by people outside paid employment*. York: Joseph Rowntree Foundation (2006).
- [14] Virginia Braun and Victoria Clarke. 2019. Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise and health* 11, 4 (2019), 589–597.
- [15] Federico Cabitzza, Angela Locoro, Carla Simone, and Tunazzina Sultana. 2016. Moving Western Neighborliness to East? A study on Local Exchange in Bangladesh. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. 1766–1776.
- [16] Edgar S Cahn. 2001. On LETS and time dollars. *International Journal of Community Currency Research* 5, 2 (2001), 1–4.
- [17] Manuel Castells. 2015. *Networks of outrage and hope: Social movements in the Internet age*. John Wiley & Sons.
- [18] Simran Chopra, Rachel Clarke, Clara Crivellaro, Adrian Clear, Sara Heitlinger, and Ozge Dilaver. 2022. Infrastructuring ecological sustainability through multi-scalar speculations. In *Proceedings of the Participatory Design Conference 2022-Volume 1*. 13–25.
- [19] Simran Chopra, Rachel E Clarke, Adrian K Clear, Sara Heitlinger, Ozge Dilaver, and Christina Vasiliou. 2022. Negotiating sustainable futures in communities through participatory speculative design and experiments in living. In *CHI Conference on Human Factors in Computing Systems*. 1–17.
- [20] Rachel Clarke, Jo Briggs, Ann Light, and Pete Wright. 2016. Situated encounters with socially engaged art in community-based design. In *Proceedings of the 2016 ACM conference on designing interactive systems*. 521–532.
- [21] Rachel Elizabeth Clarke, Jo Briggs, Andrea Armstrong, Alistair MacDonald, John Vines, Emma Flynn, and Karen Salt. 2021. Socio-materiality of trust: co-design with a resource limited community organisation. *CoDesign* 17, 3 (2021), 258–277.
- [22] John Clayton, Catherine Donovan, and Jacqui Merchant. 2016. Distancing and limited resourcefulness: Third sector service provision under austerity localism in the north east of England. *Urban Studies* 53, 4 (2016), 723–740.
- [23] Ram A Cnaan and Toni A Cascio. 1999. Performance and commitment: Issues in management of volunteers in human service organizations. *Journal of social service research* 24, 3-4 (1999), 1–37.
- [24] Clara Crivellaro, Rob Anderson, Daniel Lambton-Howard, Tom Nappey, Patrick Olivier, Vasilis Vlachokyriakos, Alexander Wilson, and Pete Wright. 2019. Infrastructuring public service transformation: Creating collaborative spaces between communities and institutions through HCI research. *ACM Transactions on Computer-Human Interaction (TOCHI)* 26, 3 (2019), 1–29.
- [25] Tawanna R Dillahunt, Xinyi Wang, Earnest Wheeler, Hao Fei Cheng, Brent Hecht, and Haiyi Zhu. 2017. The sharing economy in computing: A systematic literature review. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–26.
- [26] Carl DiSalvo, Illah Nourbakhsh, David Holstius, Ayça Akin, and Marti Louw. 2008. The Neighborhood Networks project: a case study of critical engagement and creative expression through participatory design. In *Proceedings of the tenth anniversary conference on participatory design 2008*. 41–50.
- [27] Chris Elsdén, Tom Feltwell, Belén Barros Pena, Bettina Nissen, Inte Gloerich, Chris Speed, and John Vines. 2020. Designing futures of money and fintech. In *Companion Publication of the 2020 ACM Designing Interactive Systems Conference*. 429–432.
- [28] Chris Elsdén, Kate Symons, Raluca Bunduchi, Chris Speed, and John Vines. 2019. Sorting out valuation in the charity shop: Designing for data-driven innovation through value translation. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–25.
- [29] Diana Garvin. 2021. Militarizing Monopoly: Game Design for Wartime. *Design Issues* 37, 3 (2021), 33–43.
- [30] Michael D Gilbert and Zachry Mark. 2012. Sharing time: engaging students as co-designers in the creation of an online knowledge sharing application. In *Proceedings of the 30th ACM international conference on Design of communication*. 121–126.
- [31] Xinning Gui and Bonnie Nardi. 2015. Sustainability begins in the street: A story of Transition Town Totnes. In *EnviInfo and ICT for Sustainability 2015*. Atlantis Press.
- [32] Mayumi Hayashi. 2012. Japan’s Fureai Kippu Time-banking in elderly care: Origins, development, challenges and impact. *International Journal of Community Currency Research* 16, A (2012), 30–44.
- [33] Elisabeth Kapsammer, Eugen Kimmerstorfer, Birgit Pröll, Werner Retschitzegger, Wieland Schwinger, Johannes Schönböck, Nikolaus Dürk, Gustavo Rossi, and Silvia Gordillo. 2017. iVOLUNTEER: a digital ecosystem for life-long volunteering. In *Proceedings of the 19th International Conference on Information Integration and Web-based Applications & Services*. 366–372.
- [34] Helena Karasti. 2014. Infrastructuring in participatory design. In *Proceedings of the 13th Participatory Design Conference: Research Papers-Volume 1*. 141–150.
- [35] Helena Karasti, Karen S Baker, and Florence Millerand. 2010. Infrastructure time: Long-term matters in collaborative development. *Computer Supported Cooperative Work (CSCW)* 19, 3-4 (2010), 377–415.
- [36] Airi Lampinen, Chiara Rossitto, and Christofer Gradin Franzén. 2019. Scaling Out, Scaling Down: Reconsidering growth in grassroots initiatives. In *Ethnographies of Collaborative Economies Conference, Edinburgh, Scotland, UK, 25 October, 2019*.
- [37] Christopher A Le Dantec and Carl DiSalvo. 2013. Infrastructuring and the formation of publics in participatory design. *Social Studies of Science* 43, 2 (2013), 241–264.
- [38] Christopher A Le Dantec, Kari E Watkins, Russ Clark, and Elizabeth Mynatt. 2015. Cycle Atlanta and OneBusAway: Driving innovation through the data ecosystems of civic computing. In *Human-Computer Interaction: Users and Contexts: 17th International Conference, HCI International 2015, Los Angeles, CA, USA, August 2-7, 2015, Proceedings, Part III* 17. Springer, 327–338.
- [39] Ann Light. 2010. The unit of analysis in understanding the politics of participatory practice. In *Proceedings of the 11th biennial participatory design conference*. 183–186.
- [40] Ann Light and Yoko Akama. 2012. The human touch: participatory practice and the role of facilitation in designing with communities. In *Proceedings of the 12th Participatory Design Conference: Research Papers-Volume 1*. 61–70.
- [41] Ann Light and Jo Briggs. 2017. Crowdfunding platforms and the design of paying publics. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 797–809.
- [42] Ezio Manzini. 2015. *Design, when everybody designs: An introduction to design for social innovation*. MIT press.
- [43] M. Mauss. 2002. *Essai Sur Le Don*. Routledge. <https://books.google.co.in/books?id=lyuwqqkFMzUC>
- [44] Pierre Monforte. 2020. From compassion to critical resilience: Volunteering in the context of austerity. *The Sociological Review* 68, 1 (2020), 110–126.
- [45] Ruth Naughton-Doe, Ailsa Cameron, and John Carpenter. 2021. Timebanking and the co-production of preventive social care with adults; what can we learn from the challenges of implementing person-to-person timebanks in England? *Health & Social Care in the Community* 29, 5 (2021), 1285–1295.
- [46] Ramírez R. Normann R. 1993 Jul-Aug. From value chain to value constellation: designing interactive strategy. *Harv Bus Rev.* 4, 71 (1993 Jul-Aug), 65–77.
- [47] Daniel Pargman, Elina Eriksson, and Adrian Friday. 2016. Limits to the sharing economy. In *Proceedings of the Second Workshop on Computing within Limits*. 1–7.
- [48] Mary Pilon. 2015. "The secret history of Monopoly: the capitalis t board game's leftwing origins. *Sat* 11 (2015), 08–00.
- [49] Antti Pirinen et al. 2016. The barriers and enablers of co-design for services. *International Journal of Design* 10, 3 (2016), 27–42.
- [50] Andrea Principi, Joop Schippers, Gerd Naegele, Mirko Di Rosa, and Giovanni Lamura. 2016. Understanding the link between older volunteers’ resources and motivation to volunteer. *Educational Gerontology* 42, 2 (2016), 144–158.
- [51] Sebastian Prost, Vasilis Vlachokyriakos, Jane Midgley, Graeme Heron, Kahina Meziant, and Clara Crivellaro. 2019. Infrastructuring Food Democracy: The Formation of a Local Food Hub in the Context of Socio-Economic Deprivation. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–27.
- [52] Robert D Putnam. 2000. *Bowling alone: The collapse and revival of American community*. Simon and schuster.
- [53] Theodoros Rakopoulos. 2014. The crisis seen from below, within, and against: from solidarity economy to food distribution cooperatives in Greece. *Dialectical Anthropology* 38 (2014), 189–207.

- [54] Juan Salamanca and Amanda Geppert. 2020. Thinking with 'care' in PD: Toward generating research programs and practices to foster 'participations otherwise'. In *Proceedings of the 16th Participatory Design Conference 2020-Participation (s) Otherwise-Volume 2*. 209–212.
- [55] Gill Seyfang. 2002. Tackling social exclusion with community currencies: learning from LETS to Time Banks. *International Journal of Community Currency Research* 6, 1 (2002), 1–11.
- [56] Jesper Simonsen and Toni Robertson. 2012. *Routledge international handbook of participatory design*. Routledge.
- [57] Chris Speed and Deborah Maxwell. 2015. Designing through value constellations. *interactions* 22, 5 (2015), 38–43.
- [58] Arthur A Stukas, Mark Snyder, and E Gil Clary. 2016. Understanding and encouraging volunteerism and community involvement. *The Journal of social psychology* 156, 3 (2016), 243–255.
- [59] Lisa Thomas, Gary Pritchard, and Pam Briggs. 2019. Digital design considerations for volunteer recruitment: Making the implicit promises of volunteering more explicit. In *Proceedings of the 9th International Conference on Communities & Technologies-Transforming Communities*. 29–40.
- [60] Austin Toombs, Shad Gross, Shaowen Bardzell, and Jeffrey Bardzell. 2017. From empathy to care: a feminist care ethics perspective on long-term researcher-participant relations. *Interacting with Computers* 29, 1 (2017), 45–57.
- [61] Vasilis Vlachokyriakos, Clara Crivellaro, Pete Wright, Evika Karamagioli, Eleni Revekka Staiou, Dimitris Gouscos, Rowan Thorpe, Antonio Krüger, Johannes Schöning, Matt Jones, et al. 2017. HCI, solidarity movements and the solidarity economy. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 3126–3137.
- [62] Laura Warwick. 2017. Designing Trust: the importance of relationships in social contexts. *The Design Journal* 20, sup1 (2017), S3096–S3105.
- [63] R. Wuthnow. 1998. *Loose Connections: Joining Together in America's Fragmented Communities*. Harvard University Press. <https://books.google.co.in/books?id=IKvZAAAAMAAJ>
- [64] Joyce Yee and Hazel White. 2016. The Goldilocks Conundrum: The 'just right' conditions for design to achieve impact in public and third sector projects. *International Journal of Design* 10, 1 (2016).