

Working with an Advisory Group to Co-design Innovative Intergenerational Climate Change Research

Aled Singleton ^{a*}, Merryn Thomas^b, Carol Maddock^b, Aelwyn Williams^b, Deborah Morgan^b, Charles B. A. Musselwhite ^c, Jennifer Twelvetrees, Tom Bateman, Russell De’Ath, Luci Attala ^d, and Laura Sorvala

^a *Geography Department, Swansea University, Swansea, UK*

^b *College of Health and Human Science, Swansea University, Swansea, UK*

^c *Psychology Department, Aberystwyth University, Aberystwyth, UK*

^d *Institute of Education and Humanities, University of Wales Trinity Saint David, Lampeter, UK*

* a.m.singleton@swansea.ac.uk, Geography Department, Wallace Building, Swansea University, Wales, UK, SA2 8PP

Abstract

This article discusses the challenges and potential of working with an Advisory Group on intergenerational climate change research. We co-design creative workshops to explore and articulate climate change perceptions and future imaginaries between younger and older people in Wales, UK. This 12-month programme of research activities led to a bespoke bilingual (Welsh and English) comic. Using a research diary format, we show how to practically follow the Responsible Research and Innovation dimensions of reflexivity, inclusion, anticipation, and responsiveness. The voices of four members of the Advisory Group and the comic book artist show the benefits of an early involvement of time, resource and trust in a group who are potential critics, advocates, and bridge-builders. In particular, we reflect on place-based practice intergenerational workshops focused on climate change, sharing a methods toolkit for community learning, the involvement of policy makers as co-designers in research and the ongoing need for community-university partnerships.

Keywords: intergenerational solidarity, healthy ageing, climate change, creative methods, imaginaries, perceptions

Introduction

This paper uses concepts and theory from Responsible Research and Innovation (RRI) to reflect upon a year-long initiative designed to further intergenerational climate research techniques. We are an interdisciplinary team based in geography, health and ageing studies. Our approach aligns with RRI’s outlook for society to be involved in science (Owen, Macnaghten & Stilgoe 2012; Ten Holter 2022), to confront societal challenges (Fisher 2022), to be involved in the governance of global challenges and wicked problems (Ludwig et al. 2022), and to pursue co-creation (Jansma, Dijkstra and de Jong 2022). In particular, we have concerned much of our work on the future and specifically use the word ‘imaginaries’. Consequently, there are many parallels with Herbert Simon’s writing about the *artificial* in design, namely what ‘ought to be, that is, in order to attain goals, and to function’ (1969, 5).

For our case study we draw upon the experience of the one-year OPTIC project, ‘Understanding Older and younger people’s Perspectives and Imaginaries of Climate change’. The backdrop to our research is a wider goal to contribute to healthier and more sustainable environments in which we age. However, our focus here is to further innovations in climate change research that create meaningful opportunities for younger people and older people to enter dialogue. The project works with artistic methods – such as collage (Williams 2023) and walking drifts (Singleton 2024) – and so promotes a form of creativity that is emplaced or specific to a given location. In our case we made *The Climate Comic* (or *Comic yr Hinsawdd* in Welsh) to communicate with the wider world. In doing so, we recognise that creative outputs will take flight (Rogers 2021) and be consumed differently in other contexts.

This writing starts by setting the context for intergenerational climate research. We present the research framework as originally proposed (sites, participants, and methodology) and discuss the difference made by establishing a diverse project Advisory Group. Inspired by RRI practice, our practice is explored incrementally in terms of the processual dimensions of inclusion, anticipation, reflexivity, and responsiveness (Stilgoe, Owen, and Macnaghten 2013). In particular, we illustrate how establishing an external Advisory Group embodied reflexivity. The members helped develop a workable plan of inclusive workshops and anticipated some deliberative processes that we would follow. The comic itself is more an achievement of the artist in collaboration with the research team. However, the task of taking the work forward - focused around responsiveness – relies on what Advisory Group members learned from the project and what they can implement in their own volunteering roles and professional disciplines. In our conclusions we caution that such acts of co-design are dependent on researchers forming relationships outside their institutions and argue for meaningful community-university partnerships (Olabisi et al. 2022).

Intergenerational climate research

Research shows strong perceptions of climate anxiety amongst younger people. From within 2,000 young people surveyed about climate change in 2020, nearly three quarters of were worried about the state of the planet, and close to a half did not have faith in their parents’ generation to tackle the challenges (Cunsolo et al. 2020). This sentiment connects with a perception of climate ‘denial’ amongst some older respondents in a previous study (Weber 2010). More recent media reports highlight negative media representations of older people’s climate change views (Catanzariti 2022; Sundaravelu 2022). However, more detailed studies show that higher levels of climate scepticism only exist amongst some groups of older people (Poortinga et al. 2011). To further explore these contradictions there is a need to build on the limited examples where older people are involved alongside younger generations in climate change research (Ayalon et al. 2022; Shrum 2011). Intergenerational approaches are limited in policy making. However, they are starting to influence the European Union (Filipova et al. 2021). Wales is particularly forward thinking as the devolved Senedd (or Welsh Parliament) established a Cross Party Group on Intergenerational Solidarity in 2020 (alongside the World Health Organisation Decade of Healthy Ageing). The Senedd passed an Environment Act in 2016 and the Wellbeing of Future Generations Act in 2015. The latter established a Future Generations Commissioner, appointed by the Welsh Government (the executive who govern the Senedd), who is able to scrutinise policy and practice in terms of promoting sustainable development, the protection of natural resources and needs of those yet to be born. The recently appointed incumbent in latter role recently encouraged young and old to work together and to ‘leave behind a liveable planet’ for future generations (Walker 2023). Later in this article we explore how such powers and legislation are being used within Wales.

Materials and Methods

The project’s primary focus was to explore how climate change affects environments and therefore the health and wellbeing of people as they reach older age (Peace 2022; Wanka et al. 2014). OPTIC proposed workshops in five everyday environments, specifically: a street comprising shops and services that fall outside the city centre; a small settlement whose economy previously relied on carbon intensive industry; a farming area; a setting where primary school children visit a care home; and a coastal location. As is detailed in this article we used cutup and collage (Williams 2023), outdoor walking methods (Springgay and Truman 2022), online walks (Singleton 2024), the use of comics (Thomas et al 2021) and games (Thomas et al 2018). Such approaches offer effective means to involve intergenerational groups in articulating intangible values and exploring change by making the familiar strange and forcing us to linger and to notice (Mannay 2016). We engaged participants (n=55) through workshop activities (n=5). An equal number of participants were older (over 65) and younger (under 25). The workshops aimed to capture stories of climate change perspectives, behaviours and – with particular interest to RRI - visions for the future (Nordmann 2014). The broad format of the workshops is outlined in Table 1.

Table 1- Format for Three Hour Workshop

0:00	Arrivals Reading and signing consent forms and questionnaire
0:20	Welcome Introduction to the project and team, housekeeping, confidentiality, etc.
0:30	Icebreaker Twenty artefacts laid out and participants asked to choose one. Participants and facilitators introduce ourselves, and say why we chose the item and how (if) it relates to climate change.
1:00	Discussion in breakout groups “Finish the sentence” activity
1:20	Coffee and comfort break - provision of comic examples to those making comics
1:30	Break out activities One activity per participant, chosen prior to workshop: <ul style="list-style-type: none"> - mobile interview - online spatially-led interview - comic-creation activity - cut-ups and collage activity - video-making activity
2:30	Wrap-up Reconvene with drink, discussion, wrap-up, thanks and debrief
2:50	Final questionnaire and close Ask participants complete final questionnaire, collect vouchers and debrief sheet.

The workshop was designed to be flexible. Principally each would run as an indoor exercise in a venue. Having a second space allowed for more than one break out activity to take place. Certain elements, such as the mobile interview, were staged outside. Alternatively, the whole session could be hosted online on a platform such as Zoom. It was made clear to all participants that their work would be used in the making of a bilingual Welsh and English

accessible visual comic. Forms of the comic would be shared as hardcopies, via a website, social media, interactive public exhibitions and to a significant Welsh language festival for young people.

Through this article we present how the workshop format was developed. The project set out to explore wicked problems through processes which are creative and participatory (Buchanan 1992; Marschalek et al. 2022). We concluded the project with a shared learning event, where participants, Advisory Group members, artists, community activists, and government representatives came together.

Presenting research in the form of reflexive diary

In this article we want to develop a case study which can be used by others, including beyond academia. We share an understanding that the iterative nature of participatory design can be understood in ‘project management terms’ (Ten Holter 2002, 285). For example, the need to evaluate a process that has already been agreed and to follow co-creation cycles (Foley, Sylvain, and Foster 2022). We have amended our practice as we have gone along and so present our findings in the form of a (generally) linear research journal (Ortlipp 2008). These include recordings and notes from the meetings and observations from the team. Towards the end of the project the lead author met some members of the Advisory Group in person and also collected some written reflections. Reconfirming the research diary approach, we note that the traditional Introduction, Methodology, Results and Discussion (IMRaD) format has been questioned by those exploring reflexivity in fields such as healthcare improvement (Davidoff et al. 2009; Garritty et al. 2020). Instead, we follow an RRI precedent where Jansma et al. (2022, 38-40) analyse three co-design projects around the four processual dimensions defined by Stilgoe, Owen, and Macnaghten (2013), namely: inclusion, anticipation, reflexivity, and responsiveness. In our case we bring reflexivity to the front of the list, following Jansma et al. (2022), as we feel that this principle underpins our approach. In particular this structure allows us to bring forward four voices from the Advisory Group and, later, the artist Laura Sorvala. These perspectives represent the importance of bridge-builders – or what Olabisi et al (2022) call ‘boundary spanners’ - who allow the project team to put co-design at the centre of the research activities.

Authorship is important. More than a quarter of the content is written by the five co-authors. Though they share a chronological view of the project, co-authors do not have share the same interests or understanding of methodology, results, or discussion as the research team. For example, the artist who designed the comic book is most interested in producing visual representations of the discussions, rather than how the workshops are planned. One co-author works in politics and is interested in how to bring more people into climate change discussions. These two latter positions, amongst others, are explored within this paper.

1. Reflexivity

Marc Steen (2021) writes in depth about reflexivity in responsible innovation. In very simple terms he describes reflexivity with respect to actors thinking back on their own actions and to consider the values that they have brought to a situation. He acknowledges the hard work involved in reflexivity and advocates a form of *slow innovation*. Similar conclusions are made as Seravalli, Upadhyaya and Ernits (2021) write about innovation in the public sector. The latter authors ask for reflexivity to be nurtured and encourage co-learning, especially given a focus many organisations have on efficiency (particularly in terms of budget cutting)

and strong cultures of linear processes. In our writing we discuss the work of the Advisory Group as an embodied form of reflexivity for the OPTIC project. In our case these individuals (see Table 2) voluntarily joined the project after the funding was secured, and were not involved in the funding application or the initial methodological design. We discuss whether they should have been involved earlier in the conclusions.

Using different forms or structures of advisors or experts features in literature focused on participatory research and RRI. Olabisi et al. (2022) write about community advisory boards and their long-term value to community-university partnerships. Specific to health, Koskinas, Gilfoyle and Salsberg (2022) explore examples of patient, carers or members of the public who support participatory health research as members of advisory boards, committees, panels, groups, councils, and other types of collective form. Advisory groups are discussed as an early commitment to co-design by Jansma, Dijkstra and de Jong (2022). Involving the expertise of older people is important to a significant international energy project (Maddock et al. 2023). In a case which explicitly developed a toolkit for intergenerational research, Turcotte et al (2023) explain that their advisory committee consisted of nine academic researchers and 11 community partners. Though a balance of skills, experience and networks is important, Rip (2016) cautions that members of advisory groups may not necessarily be experts in RRI. This lack of expertise applies in our case study. However, we could offer extensive experience of working with older people and thus counter criticism by Doyle and Timonen (2010) of older people having involvement when they are on advisory panels.

We moved quickly to develop our Advisory Group. In the first week of the project an advert was written in English and Welsh. This was circulated through the email list of more than 1,000 people by the Centre for Ageing and Dementia Research (CADR), a community university partnership (Olabisi et al. 2022) which works with older people and those in policy and practice. The project Advisory Group was also recruited by social media and through word-of-mouth recommendations. The timeline of Advisory Group involvement is shown in Figure 1 and its members are shown in Table 2. There were five distinct phases to their involvement, including the development of an inclusive research approach, workshops (see Table 1), comic creation, public engagement, and a learning event.

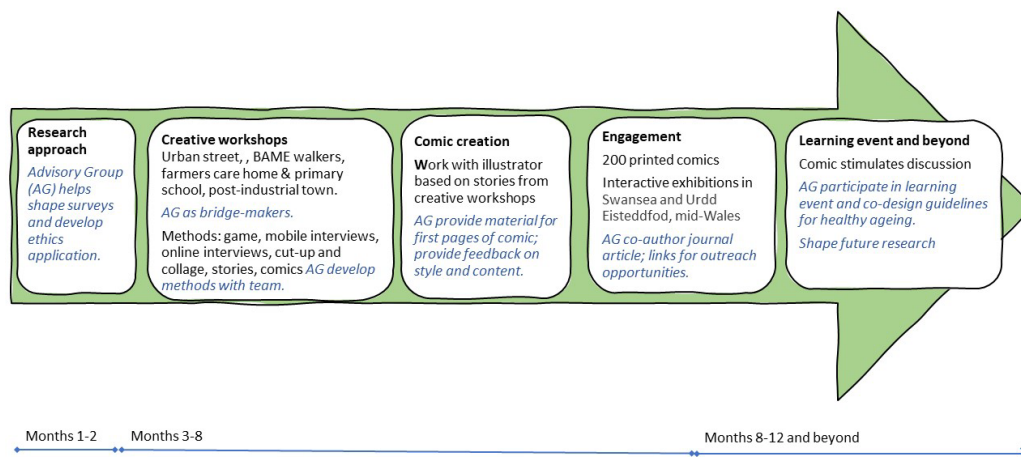


Figure 1: Co-development of the OPTIC project with our Advisory Group

All Advisory Group members were invited to be co-authors for this paper. Some contributed anonymously, and those who chose to be named are marked with an asterisk (Table 2).

Table 2 - Members of the Advisory Group

Name or role	Organisation	Over 65
*Russell De'Ath, Policy Advisor	Natural Resources Wales	No
Community Development Officer	Regional Government	No
Reader in Geography	Host University	No
Lead for Engagement and Participation	Local Government	No
Honorary Researcher	Host University	Yes
Volunteer	Works with children	Yes
Phoebe Brown	Repair Café Wales	No
Loz	Independent social care trainer	Yes
*Jennifer Twelvetrees	Volunteer, Women4Resources	Yes
Social Care Commissioner	Local Government	No
Policy Advisor	Regional Government	No
Artist	Local arts charity	Yes
*Tom Bateman, Communications Officer	MP Beth Winter	No
Early Career Researcher	Indian University	No
*Luci Attala, Anthropologist	University of Wales Trinity St Davids and United Nations Educational, Scientific and Cultural Organization (UNESCO)	No

The membership of 15 broadly splits between two fields: firstly, those involved in educational activities, ranging from young people to higher education and lifelong learning (n=9); and secondly, those who work in politics or public sector policy-making (n=6). One of the former group works for an environmental charity and one of the latter works with Natural Resources Wales, a body with a statutory responsibility for environmental regulation. Five of the Advisory Group are aged 65 and above, all of whom are aligned to education or community-based activities. A common factor amongst several group members was a desire to come together in ‘the conception and planning of the artificial’ (Buchanan 1992, 14), In our case the ‘artificial’ was to think about climate change and the future. Motivations for joining the advisory group varied.

Jennifer Twelvetrees is a longstanding Swansea resident. Jennifer’s imagination of what older people, as she describes herself, can pass on to future generations relates to her experience of the ecofeminism movement during the 1960s and 1970s (Mies and Shiva 1993). She remembers how women’s protest marches from south Wales to the nuclear weapon store at Greenham Common in the early 1980s (Kerrow and Mordan, 2021) helped people become aware of what was happening in the wider world. Jennifer is part of the Intergenerational Network UK and cites examples of place-based relationships between young and older people in Edinburgh and north Wales. She was interested in techniques which bring the older generation out of their houses.

Russell De’Ath works for Cyfoeth Naturiol Cymru, Natural Resources Wales (NRW), who are principal advisers to Welsh Government about issues relating to the environment and its natural resources. He brought recent experience of NRW capturing community knowledge of nature loss through the Wales-wide *Nature and Us* conversation. This work started with online events, quantitative surveys but later shifted towards focus groups. He was interested in exploring the specificity of climate change in certain places and testing whether one message applies everywhere.

Tom Bateman is Communications Officer for Beth Winter, Labour Party Member of Parliament (MP) for the Cynon Valley constituency. Though flooding has been a major issue, and the climate crisis is a core pillar of the MP's work and platform, Tom noted that climate change hasn't inspired much engagement from constituents. He asked if they are perceived as middle-class issues for people in cities who are already passionate about climate change. Indeed, research around Climate Assemblies staged across the UK in 2021 (Carrick and Elstub 2023) confirms that already being interested in the topic made people more likely to attend. As such Tom sought approaches to broaden involvement.

Luci Attala is an academic anthropologist. For the United Nations Educational, Scientific and Cultural Organization (UNESCO) she directs the Member States' intergovernmental Council Bridges Hub for the UK. This body involves drawing community knowledge into high level discussions about managing social transformations under climate change. She noted how this work impacts many different social groups who can't access or understand 'techno fixes' favoured by some members of the global population. This sentiment echoes the efforts to lessen *solution strategies* and reliance on *dominant stakeholders* (Ludwig et al, 2022) often favoured when confronting wicked problems and global challenges. Luci underlined the potential to make a non-technological difference to many lives.

As shown in Figure 1, the Advisory Group was involved in each stage of the project from October 2022 through to its completion in September 2023. In the following two sections of this paper, we show how the Advisory Group played a significant role shaping the research methodology used with participants. Specific examples are discussed and analysed with regard to ongoing debates about Inclusion and Anticipation. Through each example the voices of Advisory Group members Jennifer, Tom, Russell and Luci add commentary as they consider practicalities and potential policy outcomes.

2. Inclusion

Inclusion is described by van Mierlo, Beers and Hoes as meaning: 'that participatory, tailor-made techniques for public dialogues are used to include the public, NGOs and other stakeholders that are usually absent from science, development and innovation, with the aim to open up the innovation process' (2020, 361). Jansma, Dijkstra, and Jong (2022) go beyond public dialogues and argue for the sharing of power among participants and other stakeholders. There are precedents for co-designing research with older people. For example, Turcotte et al (2023) followed an iterative process to produce a toolkit. Of note, this latter case study concerns a three-year project with staff to manage a committee which guided the decision-making process through various phases of participatory action research.

OPTIC was relatively lightly resourced, with no staff solely dedicated to the project. Nevertheless, the team moved quickly and the first Advisory Group meeting took place in the fourth week. Beyond making introductions, the meeting involved scrutinising the contents of a proposed ethics application. A commissioner of adult social care was concerned that some interventions would not be accessible to those living in care or with sensory loss and limited or no digital skills. From RRI research on ageing and technologies, Bechtold, Capari, and Gudowsky (2017) ask practitioners to assess the desirability of technologies before research and development begins, stating that 'within a shared responsibility constellation, we suggest that the potential user of the technology should have the last say on that question' (2017, 171). The position to use technology sparingly was also backed by one member of the Advisory Group aged over 65. As a result, we planned activities that were analogue, such as

This latter comments connects with ‘slow innovation’ Steen (2021) or Buchanan’s use of the term ‘indeterminate’ (1992, 17) to describe wicked problems.

The way in which people interacted with each other and the degree to how the atmosphere was welcoming and productive were recorded by a video camera in the corner of the main room. This record showed people listening to each other: both adding different perspective and affirming those already stated. As noted in Table 1, the workshop format lasted up to three hours and included stops for refreshments. A commitment was made to provide drinks and food in the different research site - echoing Oakley (1981) in her seminal essay on feminist research, where hospitality is important and is a vital first step in achieving rapport and balancing power in workshops and interviews. On a final note, some members of the Advisory Group offered stronger criticism of our plans through email. One noted the lack of ethnic diversity in the proposed research sites. The Principal Investigator later made connect with an Asian women’s walking group in a nearby town. This resulted in a very productive outdoor workshop which greatly extended and improved inclusivity.

The openness to change reflects Jansma et al. who found from three co-design projects that ‘adaptation is easier to achieve in an early developmental stage of the technology, as there is still room for adjustment than in a later stage’ (2022, 43). In our case the ‘technology’ - see more in Buchanan (1992) - was the toolkit of workshops, including the use of objects, dice and other methods. In the next section we consider anticipation. Here we show how the Advisory Group helped to foresee how intergenerational conversations could elicit perceptions and imaginaries of climate change

3. Anticipation

Anticipation is considered by some to be cornerstone of RRI. Nordmann offers the following caution for anticipation both as a form of governance and as a method:

... a precautionary approach that promotes a regime of vigilance, that is informed by historical experience, and that requires imagination for what might happen in the world as we know it – without anticipating impacts or requiring knowledge of what the future might hold (2014, 95).

The latter argument can be extended to the work of the research team itself; needing to have discipline in understanding the role of the past and to be genuinely open to what the future could hold. In a recent paper Urueña cites von Schomberg’s (2012) description of anticipation as helping to ‘overcome the often too narrowly conceived problem definition scientists implicitly work with’ (2024, 10). Anticipation can bring forward ‘narratives of expectation as well as other plausible pathways that may lead to other impacts: to prompt “what if...” questions’ (Owen, Macnaghten, and Stilgoe 2012, 755). Indeed, the Advisory Group’s perspective brings capability and experience. For example, Jennifer’s knowledge that people learned more about nuclear weapons after Greenham. Moreover, Russell works on Welsh environmental policy which is explicitly designed to benefit future generations. Mauser et al. (2013, 423) argue that co-creating knowledge for sustainability should combine both theory and situated reflections on societal contexts.

Given the aforementioned anxiety around climate change (Cunsolo et al. 2020), the workshops had to sensitively represent accounts of the past alongside *artificial* or *imagined* climate-changed future environments. Carefully facilitating such conversations not only allowed important surfacing of conflict and differences, but also showed how to build intergenerational solidarity desired by Welsh policy makers (Walker 2023) and the

transmission of knowledges between generations (Filipova, Canal and Mayrhofer 2021). In this section we explore how Advisory Group members, introduced earlier, helped the project team anticipate the types of discussion where participants engage with the past and future. We start with a significant example of intervention from the Advisory Group.

As presented in Table 1, and discussed earlier, the first main activity in each workshop involved participants picking up objects which interested them and using that object to frame a brief introduction. What they said featured some perspective on the environment or of climate change. The second main activity was designed to focus more specifically on the place in which the workshop took was staged. Originally, we intended for participants to take a card and then construct a sentence from that starting point. For example, ‘The ways we did things in the past were...’ Other cards started sentences focused on the future and some were explicitly negative. Some Advisory Group members felt that the sentences would limit discussions to topics set by the research team. Moreover, the language was seen as too complex for children. Luci commented that climate change conversations can be creative points and opportunities where ideas or approaches can begin to grow. In her view the wider narrative around climate change needs to be reconfigured away from the fear of an apocalypse and destruction to encourage people to think about how to be human on this planet today, in current conditions. This latter thought hits at the type of vigilance demanded by Nordmann (2014) and urges us not to think too far into imagined futures.

Taking the above criticisms, we greatly changed this exercise by designing a dice game and with a different stress on the words. The first dice provided the first two words of the sentence. This conveyed a temporal dimension (past, present or future) and also some degree of emotion. The second dice defined the setting or activity. Altogether there could be 36 different combinations, such as ‘I hope... nature’ or ‘I remember... places’. An illustration of how to play the game forms part of the final comic book and is shown in Figure 3. This includes more than twenty responses given by participants. Sharing this detail makes the process open (van Mierlo, Beers and Hoes 2020) and encourage a knowledge commons which supports co-governance (Foley, Sylvain and Foster 2021).

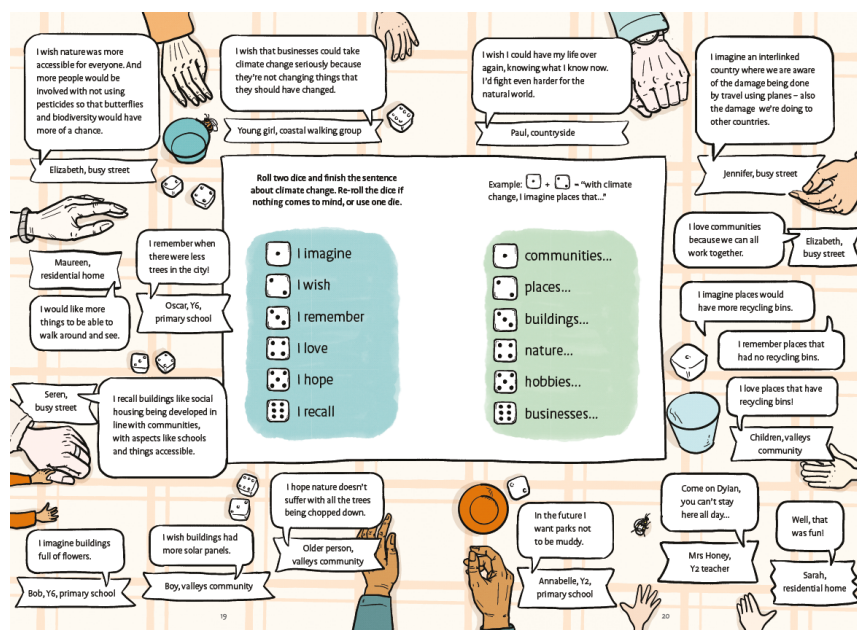


Figure 3 – The dice throwing game © Laura Sorvala

Tom noticed that the speed of the dice game allowed people multiple attempts, and therefore relieved any pressure they may have felt. This comment regarding perceived pressure is important because people are aware that their expectations (Jansma, Dijkstra and de Jong, 2022) or views may differ to others in the group. Indeed, the dice game became somewhat of a hero or a serious element (Ruggiu et al. 2022) of each workshop. In the workshop with a care home and primary school the children were taught how to play the game prior to visiting the care home, and then taught the residents how to play – basing their whole session around the game. In a workshop staged at a youth club, the room became a hive of intergenerational activity as the children and older adults rattled and clattered the dice, taking their turn to generate new sentences to complete. Participants, including some who were schoolteachers and youth workers, took copies away with them to adapt and use within their own setting.

Throughout this project we have embraced the spirit of responsible research and innovation. As the project was recently completed at the time writing, we can only offer some initial reflections and recommendations in terms of responsiveness.

4. Responsiveness

Responsiveness is seen by some as the act of institutions joining the ‘integrated processes of anticipation, reflection and inclusive deliberation [or inclusion] to policy and decision-making processes’ (Owen Macnaghten & Stilgoe 2012, 755). Similarly, Heltzel et al. refer to responsiveness as the ‘translation of the other three principles into practice (2020, 174). However, the latter authors argue that it is the least conceptualised of the four dimensions of RRI. The lack of clarity is evident as other writers refer to responsiveness as a part of the process within research or innovation practice, and in terms of responding to ‘significant events outside the initiative or unexpected results of the initiative’s own actions’ (van Mierlo, Beers, and Hoes 2020, 367). This ambiguity provides opportunities for us as authors to see responsiveness both in terms of process and also in terms of outcomes.

In this section we briefly present three interpretations of responsiveness which have emerged from our work. Firstly, we consider place-based focused on intergenerational workshops and climate change. Secondly, how the comic itself shares a methods toolkit for community learning. Thirdly, we reflect on our research being co-designed with policy makers. Again, we voice what members of the Advisory Group have gained from the project.

4.1. Place-based Intergenerational Workshops Focused on Climate Change

Though intergenerational dialogue around climate change is developing at a European level (Filipova, Canal and Mayrhofer 2021), examples are limited. Advisory Group member Tom Bateman, who works in political communication, was interested in broadening conversations about climate change in places where such dialogues do not happen. For clarity Tom works at a UK-level Parliament, where there is not such a commitment to future generations and intergenerational solidarity as made by The Welsh Government and Senedd. Tom played a significant role in brokering a relationship with a community organisation that hosted one workshop and found both older and younger attendees. Tom attended the resulting workshop. In the following reflections he uses the language of a researcher, framing the experience in the RRI terms of inclusion and anticipation:

It was an interesting constraint to try and get older people and younger people in a room at the same time and on the same topic. I hadn't thought about the extent to which different generations have completely different routines. Put simply, the young people were available in the evening and the old people more available in the morning.

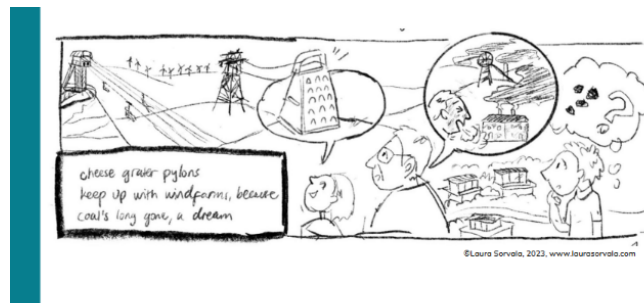
The point about different routines is important. The session was held between 5pm and 8pm on a weekday evening. To create a comfortable environment, we paid for hot food and drinks (Oakley 1981). Thinking about the innovative dice rolling exercise discussed earlier, Tom explained that the format and selection of verbs, around older people, led naturally to a discussion about past, more sustainable lifestyles, with a perceived stronger sense of community, less individualism, consumption and isolation. When workshop participants were thinking about climate change in the future, Tom noticed that many older people were not keen on reducing choice towards more locally-grown food or other products. Instead, they wanted big solutions (Ludwig et al 2022) such as making aviation more sustainable. Similar thoughts came from a different workshop, centred on a walk along a beach, where an older participant asked why we can't develop biodegradable packaging when satellites are in space.

The notion that about older people may be likely to look for systemic and state-led solutions is a useful insight for future research. However, we acknowledge that practitioners of RRI are finding a growing evidence that 'intractable societal challenges that cannot be solved by applying classic linear techno-scientific approach' (Marschalek et al 2022, 419). To a large degree OPTIC has followed this latter approach. One workshop focused on a busy urban street led to an interesting range of ideas from participants, including a young mother with a baby in a buggy. Some wanted to convert redundant car parking into spaces to grow food and others to close the street to vehicles altogether. To some extent this represents the 'dream catching' featured in a recent article about reflexive urban co-design. The latter concept refers to exploring 'people's values, motivation, aspiration, fears, memories, visions, wishes, feelings...' (Eronen 2023, 28) and going beyond the techno-rationalist problem-solving approach. Moreover, Mauser et al. (2013) are careful to point out that co-design is a critical stage which comes before co-production. Any resulting co-production in a situation such as this street will need more resources and involve stakeholders with the power to make decisions. We now reflect on the book as a toolkit of methods for others to use.

4.2. Sharing Methods Toolkit for Community Learning

OPTIC's main output is a printed book called *The Climate Comis: Tales Between Generations*. The book contains a forward from the Chairperson of the Climate Change Committee at the Senedd (or Welsh Parliament) and 14 pages of stories made from the workshops (see Figure 5). Of note to toolkits (Turcotte et al 2023) artist Laura Sorvala designed four pages which explain how the workshop methods function, a two-page spread with the dice game; and two pages with sentences produced by the latter exercise (Figure 2). As a result, the book helps schoolteachers, volunteers and families to use the technique. Moreover, this champions a demand from co-author Luci for people to know about what is being done to develop knowledge within communities.

Indigenous knowledge about older people's experiences of climate change (Herman-Mercer et al. 2016) will be critical. Looking to share our work internationally, we were grateful to the prompt to make our workshops more diverse. In turn we were glad for an opportunity from Luci to share our work (Figure 4) in a peer reviewed UNESCO publication designed to mobilise co-produced sustainability services for global impact.



**OPTIC:
UNDERSTANDING
OLDER AND
YOUNGER
PEOPLE'S
PERSPECTIVES
AND
IMAGINARIES OF
CLIMATE CHANGE**

Overview: This transdisciplinary project from Wales, UK, uses creative methods and intergenerational dialogue to explore understandings of climate change to produce a graphic novel that illustrates differences in perspectives.

Context: Through climate change, threats are emerging in previously hospitable environments. Understanding older people's climate change perspectives, behaviours, and future visions will enable environments to be shaped and managed effectively for health, wellbeing and sustainability. The illustration (above) shows one of the ways in which participants' stories are being retold in the comic.

Method: Interactive OPTIC workshops explore perspectives and future imaginaries from 55 older and younger people, including urban food growers, a primary school, a coastal care home, a women's walking group, farming family and a former industrial settlement. In these events we used creative methods including games, comic-creation, collage, cut-ups, walks, on-line interviews, Haikus and storyboarding. We wrote haikus to represent how

older and younger people describe past and present climate change:

Cheese grater pylons
keep up with wind farms, because
coal's long gone, a dream

In Laura's image we see how coal infrastructure (and the health impacts associated with it) are replaced by a zip wire for tourists, and how future environments could benefit pollinators such as bees – or not. These methods help our participants and us to take time to linger and notice, articulate hard-to-say values, and explore change by making the familiar strange. Workshops are audio recorded and stories are developed into a bilingual (Welsh and English) comic book by illustrator Laura Sorvala.

Benefits: Results of this work are being shared with policy makers (Future Wales) to design guidelines for environments that better address older people's climate change perspectives and behaviours.

Figure 4 – OPTIC feature in the Bridges: A humanities-led UNESCO coalition for sustainability © UNESCO BRIDGES publication, Used under CC BY-NC-ND 4.0 -

We included a description, a comic and a poem derived from a workshop (Singleton and Thomas 2023). Children noted how electricity infrastructure dominated their local landscape and described them as being ‘cheese grater pylons’. The chosen graphic created by Laura Sorvala represents these pylons and includes a haiku, a poetic style which originated in Japan.

Cheese grater pylons
keep up with wind farms, because
coal's long gone, a dream

This format represented the noticeable ability of younger people to describe situations in imaginative terms. In this case dreams refer to the past rather than what is to come. As the climate depends on future political landscapes, we now consider the implications for policy makers as co-designers of such research projects.

4.2. Policy Makers as Co-designers of Research Projects

Co-design has been used by advisory bodies in intergenerational research (Turcotte et al 2023) and in health research (Koskinas, Gilfoyle and Salsberg 2022). The OPTIC project offered policy makers, and people involved in potential future policy, to co-create our research. We briefly explore if this has benefits to organisations in which policy makers work and whether it can lead to climate policies of the future.

Advisory Group member Russell was in the position of comparing and contrasting OPTIC with ongoing policy work at Natural Resources Wales (NRW). Russell calls NRW an ‘evidence-based’ and ‘science-based’ organisation. The research diary approach that we follow in this article (Ten Holter 2002) is useful as it shows our workings and so helps governmental organisation to develop policy and practice. Partly confirming what Seravalli, Upadhyaya and Ernits (2021) write about the public sector’s dependence on linear processes, Russell articulates the value of approaches that help to find deeper narratives. He explains that there is a need to counter the rigidity of public bodies and how they communicate. For example, he explains the paradox of vision statements relying on words, and therefore demanding of the reader to create a visual representation in their own minds. NRW and the Welsh Government are increasingly interested in touching what Russell calls ‘the heart and head’. Being part of the Advisory Group has given him the opportunity to learn how people respond to visual imaginations of the future, and so gave him some evidence to take back to his work on at NRW. Indeed, NRW is now exploring different methods to engage new and diverse audiences, including the use of audio (Nature and Us 2023) and visual tools such as comic strip characters.

Many of the workshop discussions concerned future politics. A story in *The Climate Comic* (Figure 5) ends with one participant’s idea that local authorities could reduce council tax by 20% if people installed renewable technologies.

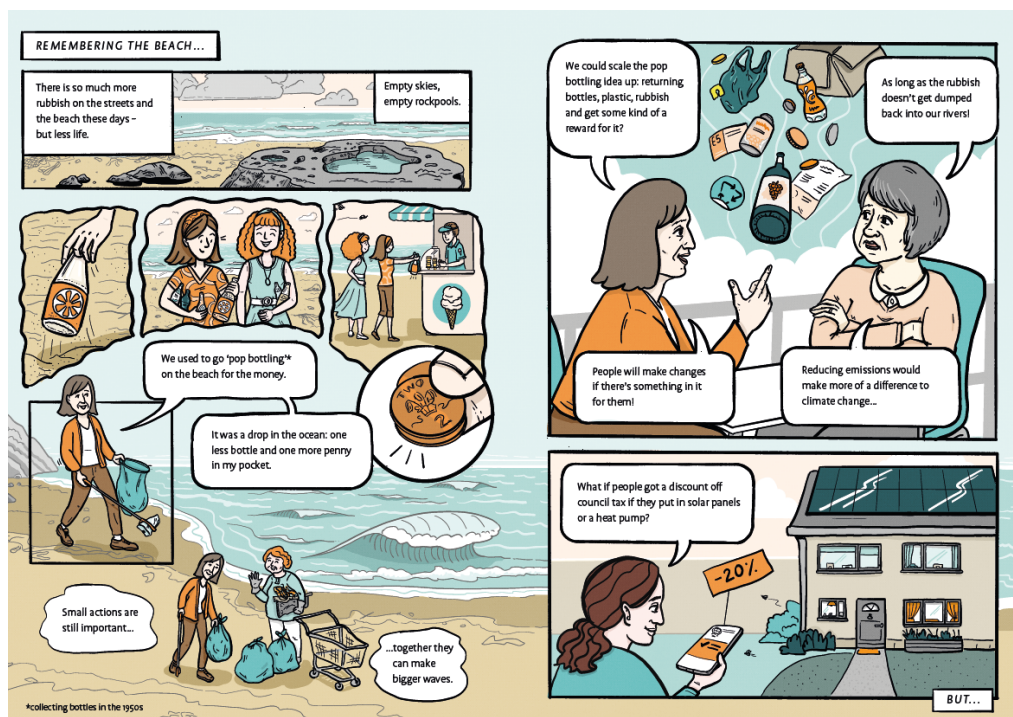


Figure 5 – Story remembering the beach © Laura Sorvala

We have not yet had the scope to test the feasibility of this idea. However, it is likely that it would either be funded through efficiencies in other services - see more in Seravalli, Upadhyaya and Ernits (2021) - or by borrowing money and raising taxes. Tom reflects that climate change issues are starting to gain or lose politicians votes. Indeed, it seems that the politics of the future (Nordmann, 2014) have already changed. In an election year Labour have recently halved the value pledged to a proposed green investment plan (Stacy and Harvey 2024). We now reach some conclusions and look to the future.

Conclusions

There is more work required to involve older users in design (Fischer, Peine and Östlund, 2020) and the mission to further intergenerational climate change research remains critical. We have presented a transdisciplinary approach (Mauser et al. 2013) involving researchers, artists, policy makers and many others. We have an written accounts which open up the process (van Mierlo, Beers and Hoes 2020) and have provided an incremental account or project diary (Ten Holter 2002). The Advisory Group - comprising of experts by experience and people working with communities and in governmental organisations, and using the participatory methods and comic book described here - offer routes to future policy and practice. We acknowledge, as notes Nordmann, that we can make assumptions about the future by following the present trajectory, and that the world 'will or might come to be, depending on whether we do the right or wrong things now' (2014, 91). The OPTIC project did not have the remit to involve architects, planners or those involved in business development. However, we have set some of the foundations for co-design and the comic book is a form of knowledge commons (Foley, Sylvain and Foster 2021).

Speaking as academics and members of the Advisory Group, we caution that the momentum and trust of community partners is not lost. Writing about the latter, Olabisi et al. describe a need for researchers to have 'humility, empathy, deep listening, and the ability to admit mistakes and course-correct' (2022, 14) when working with community partners. From our experience we find such qualities to be deeply ingrained in RRI. However, the latter authors (ibid) stress that these are not characteristics which are encouraged or rewarded in academia. Advisory Group member Jennifer shares such a sentiment, having worked for the university in the 1990s and 2000s as a non-academic with community activists of all ages. Many of these non-traditional learners were able to link theory and practice, and their involvement was accredited through an access learning programme. Rather than extending such work (Mayo, 2020) and institutionalising responsible innovation - see more in Dabars and Dwyer (2022) - Jennifer describes how the gradual marketisation of higher education meant its demise. What this means for projects like OPTIC is that they often have to start from scratch when establishing community partnerships, such as this Advisory Group.

As a research team it has been rewarding to have such an excellent Advisory Group. By contributing voluntarily, rather than being involved in a contractual capacity, they have been able to work quickly and explore very specific issues that people face. Moreover, we have involved people who work directly with communities rather than those who are strategic managers. For any future work, however, we would follow a view expressed by Jennifer that she and the people she has met through this project should have been involved at the very first stage of research design.

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