Co-creating a climate comic book: reflections on using comics in intergenerational research and engagement

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Abstract

The places where people live, work and spend leisure time are essential to their health and wellbeing. However, with climate change, these environments are changing. It is paramount we understand older and younger people's climate change perspectives, behaviours, and visions for the future so that the places that matter to them can be shaped and managed effectively for health, wellbeing, and sustainability.

This paper presents the case for using comic books to explore climate change with diverse intergenerational groups. The bilingual (Welsh/English) *Climate Comic* was created in South Wales, UK, as part of the 'Understanding Older and younger people's PerspecTives and Imaginaries of Climate change' (OPTIC) project. During February-May 2023, 65 older and younger people took part in structured workshops where we used creative methods (games, collaging, comic-creation, mobile and on-line interviews, storyboarding) to elicit intergenerational conversation, articulate intangible values, and explore change. Workshops were audio recorded, and stories developed into a comic by

illustrator Laura Sorvala. We also used comics as part of wider engagement and to stimulate ideas in a design sprint with interested groups.

We discuss why comics are suited to exploring climate change with older and younger people, and the process we used to create the *Climate Comic*. We then reflect on the affordances and limitations of our approach and make recommendations for future research in this area. We hope that this work will stimulate others to consider using this adaptable and engaging artform for further research and engagement with younger and older people.

1. Introduction

The climate crisis is the 'single biggest health threat facing humanity' (WHO, 2023) and threatens the very notion of healthy ageing. From rising sea-levels and heatwaves, through land management and care home design (Gupta et al., 2016), climate change is *the critical issue* that affects the environments in which we age (Peace, 2022). For healthy ageing to be possible during the coming decades, we need climate-resilient environments that are both sustainable and equitable. Contrary to negative media representations of older people in relation to climate change (Catanzariti, 2022; Sundaravelu, 2022), as well as exclusion of their perspectives (Ayalon et al., 2022) and higher levels of climate 'denial' amongst older respondents (Weber, 2010), involving older people in achieving this goal is essential. Designers, decision-makers, and wider society can learn from older people's experiences of change (Herman-Mercer et al., 2016); traditions of sustainable behaviours (Biara et al., 2021) and visions for sustainable futures (Leeson, 2015).

At the same time, if we are to pass today's environments of ageing on to future generations, we need to also involve younger people in these conversations. While older people can be particularly vulnerable to climate change today, future generations stand to bear the greatest burden. Furthermore, effective Earth stewardship requires better understanding of both younger and older people's perspectives, connections to valued places (Chapin III, 2020; Chapin III et al., 2011) and greater feelings of connectedness between neighbours and future generations (IDG 2024). Intergenerational conversations can also allow important surfacing of conflict, differences, solidarity, and the transmission of knowledges. Intergenerational dialogue is essential, not only because climate change will impact upon both young and old, but because the solutions are in the hands of both (Ayalon et al., 2022).

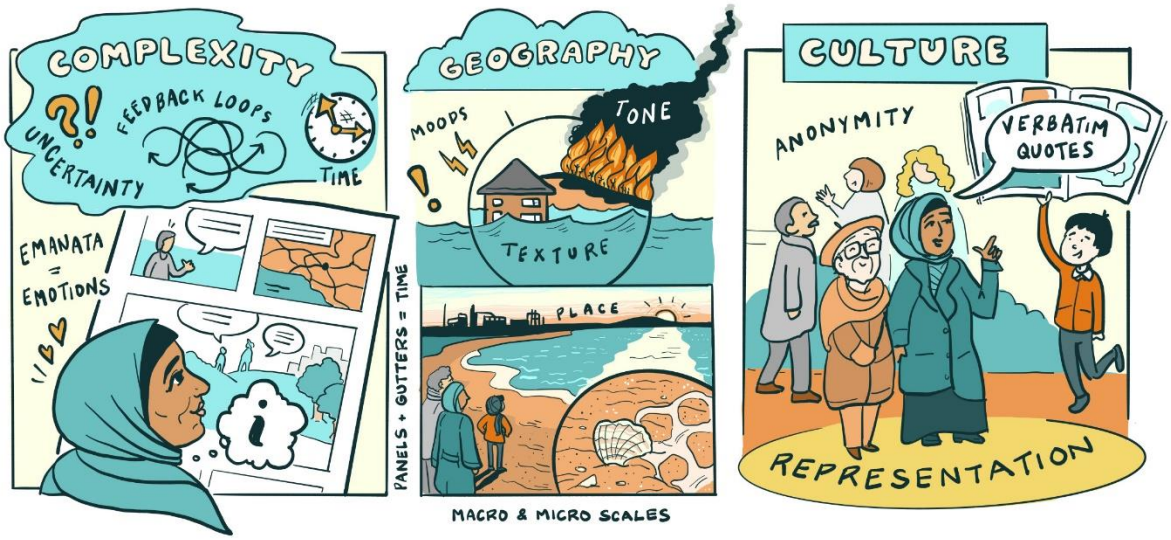
To explore perspectives, experiences, and imaginaries (visions of the future) of younger and older people, we co-created the bilingual Climate Comic (Thomas et al., 2023, freely downloadable at www.climatecomic.co.uk) as part of the 'Understanding Older and younger people's PerspecTives

and Imaginaries of Climate change' (OPTIC) project. During the one-year project we developed several creative methods (games, collaging, comic-creation, mobile and on-line interviews, storyboarding) to facilitate the telling of stories, which were then retold in the comic. Creative methods such as these can expand our capacities (De Botton & Armstrong, 2013) and explore change, by making the familiar strange and forcing us to linger and to notice (Mannay, 2016).

Such approaches are particularly suited to exploring ambiguous (Thomas et al., 2022), intangible and complex issues (Thomas et al., 2018), and to generate longer term thinking; a lack of which can be a barrier for engaging with climate change (Poortinga et al., 2011). Creative methods that use intergenerational framing can also help reduce the psychological distance of climate change for older generations (Shrum, 2021). In this paper we focus on the affordances and limitations of comics as one such creative method, and in doing so contribute to the growing field of comics-based research (Kuttner et al., 2018) while challenging age-based stereotypes associated with both comics and climate change.

Comics for exploring climate change and ageing

We believe that comics (simply, 'sequential art', McLoud 1994, p.9) are suited for engaging people with climate change for several reasons, as summarised in Figure 1. First, climate change is complex. It has multiple causes, time lags, feedback loops, uncertainties, socioeconomic and ethical considerations. Comics can portray such complexity by using multiple modes of communication (e.g., imagery, words, maps) and tools such as panels, gutters (the spaces between panels) and emanata (e.g., wavy lines for smells), and by conveying moods through tone and texture. Images can facilitate information exchange by drawing us in through vivid/emotive portrayals, helping us remember information, and transcending linguistic barriers (O'Neill & Smith, 2014). Furthermore, by simplifying subject matter, comics focus our attention on what is most important. Cartoons can even help us recognise ourselves as being part of an issue, through providing characters or places that are 'universal' and relatable (McCloud 1994). In other words, it is easier for me to identify with a simple cartoon character than a detailed depiction of someone who does not look like me.



[Figure 1: Potential of comics to engage people with the complexity, geography, and culture of climate change. Illustration by Laura Sorvala]

Second, climate change is geographical, bound by space and time. Comics are particularly useful for engaging with place, as demonstrated by Peterle (2021) in her exploration of mobility and urban space through an integration of photographs, interviews, maps, and archives. Graphic narratives can bridge the 'macro scales of environmental change with the micro scales of our everyday human lives' (Davies 2022), such as in Beaton's *Ducks* (2022), which communicates the environmental and social impacts of the Canadian oil sands using a variety of spatial scales from sweeping landscapes to locks on doors. Details of place can be communicated through scene-setting imagery such as these, but also by appealing to our senses using symbols, such as emanata, and by visually representing sounds (McCloud 1994). The reader also must do their own work, by filling in what happens in the gutters. In this way, panels can be manipulated to describe time scales from geological epochs to a pregnant pause.

Third, climate change is a social and cultural phenomenon, as well as an environmental one. Comics can be effective in representing stories from -and to- diverse audiences, due to their narrative format and communication of ideas through words, images, movement, and time (McCloud 1994). McNicol and Leamy (2020, p. 269) suggest that, 'through combining text and visual methods of communication, comics offer a means for the expression of interior, or silent, voices, especially of those whose voices are often ignored.' In December 2023, the latest edition of Alice Oseman's LGBTQ+ *Heartstopper* series became the UK's fastest-selling graphic novel ever (Creamer, 2023). Indeed, comics are not just for children/teenagers, and not just about superheroes. The medium tackles an enormous breadth of topics including the holocaust (Maus, Spiegelman, 1986), the Iranian

revolution (Persopolis, Satrapi, 2006) and sexual angst (Fun Home, Bechdel, 2006) to name a few. Practically speaking, comics offer a way to present several participants and voices on a page, and a variety of methods for anonymisation. For example, comics artists can remove or change backgrounds or omit identifying characteristics.

Comics have rich history of representing nature, from anthropomorphic animal characters (DogMan), animal/natural totems (Cat Woman, Batman, Spiderman) to those with ecokinetic powers (Aquaman, Storm) (Dorbin, 2020). A growing number of comics tackle the climate and ecological crises. These include *The Most Important Comic Book on Earth: Stories to save the world* (Goodenough, 2021); a collaboration of 300 environmentalists, artists, authors, and personalities. The hugely varied, stunning and colourful works tackle the causes and consequences of ecological devastation, as well as stories of restoration and inspiration. Delving deeper into the physics, Phillippe Squarzoni's *Climate Changed: a personal journey through the science* (2014) is an example of how comics can be used to explain complex and highly technical subject matter; while Joe Sacco explores the social and cultural costs of resource extraction in his trademark journalistic style, in *Paying the Land* (Sacco, 2020).

Despite 'immature geek' stereotypes and stigma related with comic books (Lopes 2006, p.405), they can appeal to a wide range of demographics. To start, there has been a resurgence in the popularity of comics for children. No longer are comics seen as niche or cult reading, but are recognised as powerful teaching tools (Serantes and Dalmer, 2023; Williams, 2008) for a range of age groups. There are easy-read comics for the earliest readers (e.g., Viva, 2012), weekly educational comics for home-based learning (Phoenix, OKIDO) and graphic novels for teenagers (e.g., Gaiman and Russell, 2008). Comics can engage reluctant readers, promote multimodal communication, and improve visual and critical literacy (Dallacqua, 2012). They also provide opportunity to learn about storytelling and can challenge in-class literacy norms for students and teachers (Dallacqua, 2020). Topics range from English and history through maths (Larry and Woollcott, 1993), with a growing number focusing on environmental issues (Environmental Comics Database, 2024).

Some comic authors tackle a breadth of age groups: Raymond Briggs might most often be associated with children's classic *The Snowman* (1978), but his final work *Time for Lights Out* (2019) tackles older age through a collection of short, humorous, and melancholy pieces. Indeed, a growing number of comics feature older people or address issues of ageing. For example, Rebecca Roher's (2024) *100 Year-old Wisdom*, aims to 'document individual histories of the past hundred years, take a realistic look at aging and the needs of the elderly, and promote the secrets to a good and healthy life' (pers. comm. 2022). Roher's earlier work, *Bird in a Cage* (2016) is a more personal reflection on

her own grandmother's life before and after being affected by dementia. Dementia is also explored in Leavitt's *Tangles: A story about Alzheimer's, my mother and me* (2011). Here Leavitt pieces together the biographical stories of her mother and herself to remember the times before and during illness. There are signs that comics authors are diversifying their narratives away from 'graphic pathographies' (Green and Myers 2010) such as these to less predictable stories (Serantes and Dalmer 2023). For example, *Blossoms in Autumn* (Zidrou and De Jongh, 2019) is a beautifully drawn story of new romance and opportunity in later life, albeit with a 'somewhat infuriating' ending (Cooke, 2019). Such stories can foreground alternative narratives of ageing, potentially shaping readers' imaginings of growing older (Serantes and Dalmer 2023) and challenging ageist stereotypes.

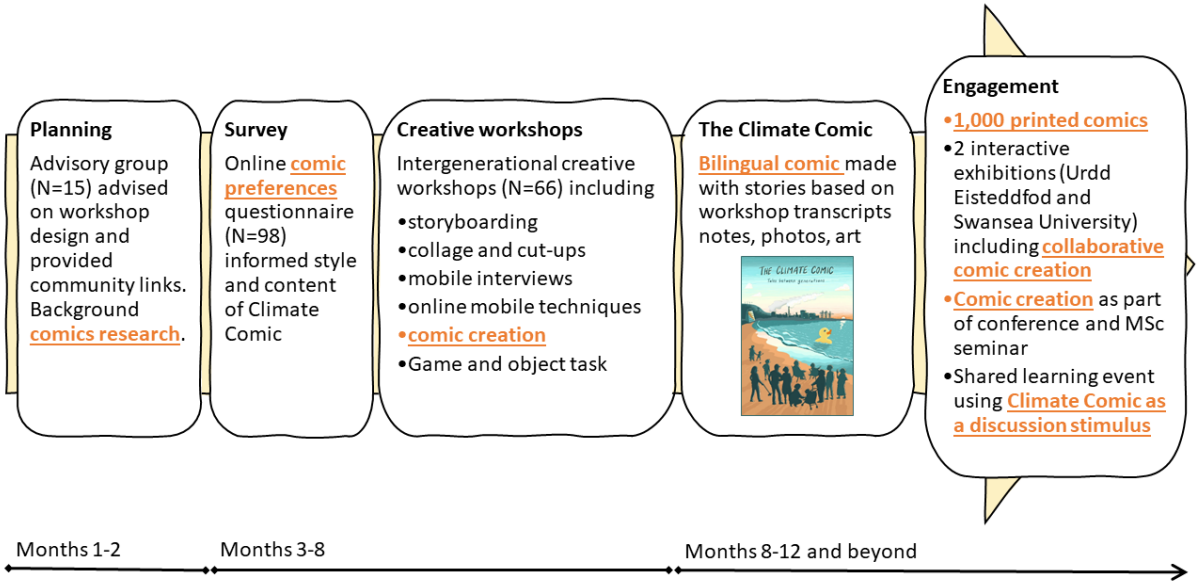
2. Methods

Context

The OPTIC project was based in the area around the city of Swansea in Wales, UK. As a small nation of just over 3.1 million people, Wales has devolved powers over policy issues such as health, social care, economy, education, and climate change. As a host organisation, Swansea University has strong links with communities, care homes, businesses, charities, and social enterprises through our work with the Wales-wide Centre for Ageing and Dementia Research (CADR) and Enabling Research In Care Homes (ENRICH) Cymru research programmes. We wanted participants to be able to sustainably reach our programme of workshops, gatherings and exhibition within an hour. Further, by working within South Wales we could explore multiple challenges for older people that exist in varied coastal, upland and urban environments , including isolation, poor transport links and difficult winter conditions.

Climate change risks in South Wales include fluvial flooding, sea-level rise, heatwaves, landscape change and impacts upon place-identities connected to farming and heavy industry; geographical lenses used by individuals to make sense of climate change and energy issues in the places that matter to them (Thomas et al., 2018). The region also has a highly challenging path to net zero, in part due to heavy industry and high agriculture emissions (Stark et al., 2019; Williams et al., 2021). We also considered that facilitating opportunities to contribute via the Welsh language offers possibilities to access tacit climate change knowledges and behaviours. This is recognised in the new Welsh curriculum, for example, which introduces the Welsh word "cynefin" as a key concept representing habitat/dwelling or familiarity in Welsh (Adams, 2023), reflecting a focus on local context and community values but also a profound yet active connection with the land and the natural world (Tyne, 2022).

Ethical approval for the project was granted by Swansea University's School of Health and Social Care Ethics Committee (reference 108948). We used comics for data collection and engagement throughout the project, reflecting a spectrum of co-creative practice (Thomas et al., 2021). Members of the public participated in a variety of ways, from completing a questionnaire about comic preferences, through telling a story that became part of the Climate Comic, to contributing to a shared comic at an exhibition (Figure 2). The remainder of this section elucidates these modes. We then consider the affordances and limitations of our approach in our findings and discussion.



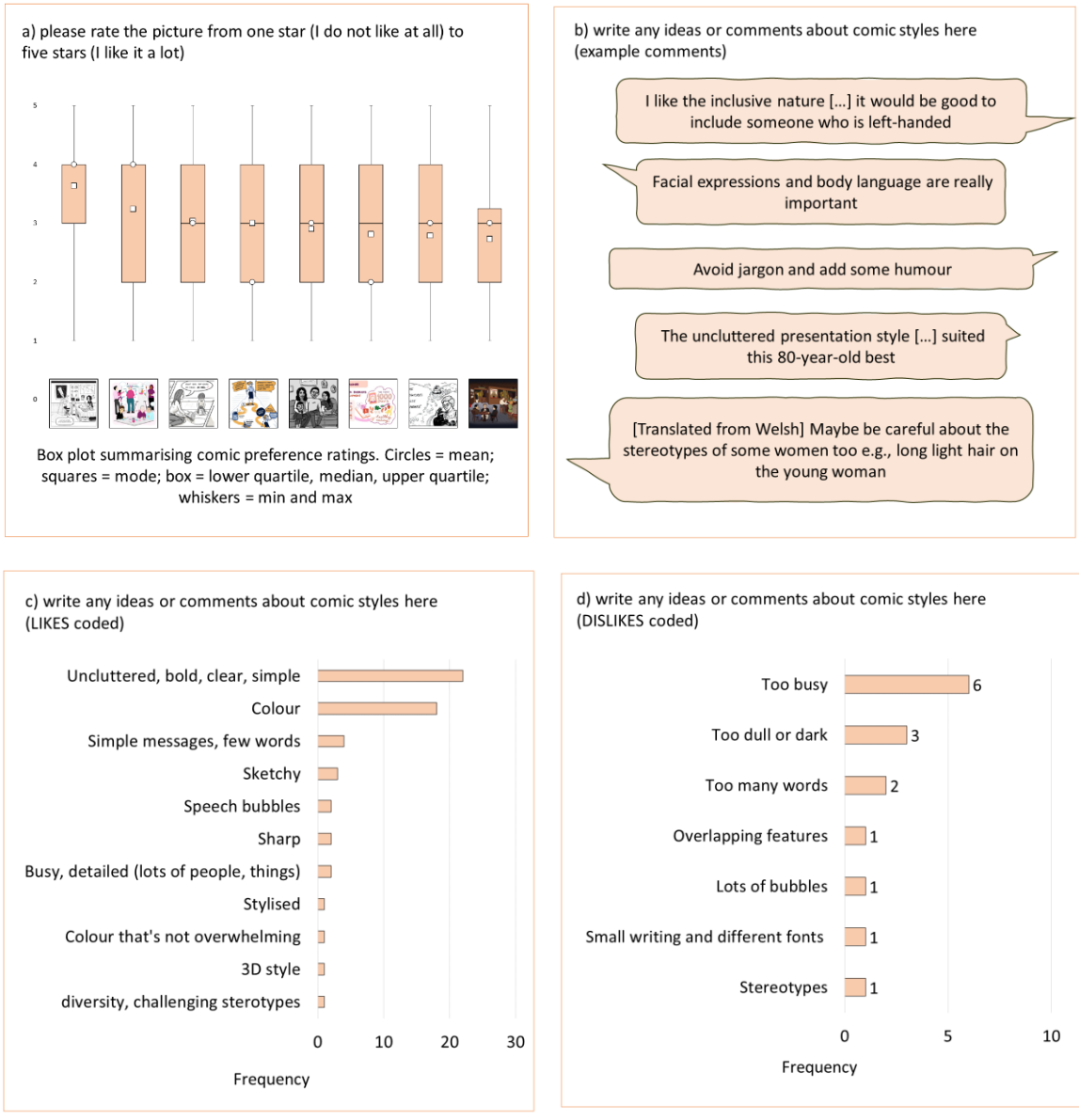
[Figure 2: OPTIC workplan highlighting the role of comics-based-research through the project]

Comic preferences questionnaire

After forming an advisory group, we discussed with illustrator Laura what the comic might look like. Finding the research team had divergent ideas about what could work best in a comic for older and younger people, we designed a short bilingual questionnaire to gain insight into what members of the public would prefer (Supplementary Material A). The questionnaire asked respondents to consider eight of Laura's images, bearing in mind the aims of the comic to explore climate change and to appeal to a wide audience. Respondents rated each image, in randomised order, from one star (I do not like it at all) to five stars (I like it a lot). We then asked respondents to 'write any ideas or comments about comic styles' in a free text box, and finally their age so we could gauge if we had included a range of ages. There was an option to assist someone else to complete the questionnaire.

We recruited questionnaire participants via social media, e-mailouts to members of the CADR network, and word of mouth. Of 98 respondents, 15% were under 25 years old; 61% were between

25-64 years old, and 24% were over 65. The youngest participant was four, and the eldest was 96. In general, participants preferred bold, colourful images that avoided stereotypes and were not 'too busy.' They also liked 'some humour,' and simple messages with few words (Figure 3).



[Figure 3: summary of results from comic preferences survey (N=98)]

Creative workshops

During February-May 2023, 65 older and younger people took part in creative workshops. This included two pilot workshops (n=10) with advisory group members: one in-person at Swansea University, and one online. Five workshops were then conducted in varied urban and rural environments, where we deliberately targeted certain populations and geographies to reflect a diversity of demographics and lived experiences (Table 1). Recruitment was purposive, drawing on

existing networks and contacts made through our advisory group. For example, one member connected us with a youth club he had links with, and another with her community food growers' group. A contact made at a conference volunteered to link us with a BAME group she was a member of, while the school, care home and farming families were invited to take part via existing contacts of the first author. We liaised mainly via email, using telephone where participants preferred.

There were no exclusion criteria for the questionnaire nor exhibitions. For the workshops, we targeted those under 25 years old and over 65 years old to explore intergenerational perspectives, but also included several participants between these ages (Table 1). We provided participants (and parents/guardians of under-16's) with easy-read participant information sheets and consent forms. For children under 16, we obtained informed consent from parents or guardians before workshops. For children over 12, informed consent was also obtained from participants themselves. Following standard ethical procedures, participants were free to leave sessions at any time, and were provided with a debrief containing further information and contact details for support.

Location	Participants	Activities
In person pilot	3 advisory group members >65 (3 female) 5 advisory group members 25-65 (3 female)	Collage, walking interview
Online pilot	1 advisory group members > 65 (1 female) 1 advisory group member 25-65 (0 female)	Online mobile interview
Primary school and residential home in a coastal village	6 year-2 students aged 6-7 (3 female) 6 year-6 students aged 10-11 (3 female) 7 care home residents aged >65 (7 female)	Game in the residential home; comic creation in school with Y6 class.
Youth club in a valleys post-industrial town	8 friends of the YMCA aged >65 (2 female) 7 YMCA members aged <16 (5 female)	Cut-ups and collage; online mobile interview
Black and Minority Ethnic women's walking group in an industrial coastal town	6 adults aged 25-65 (5 female) 2 young adults aged 17-25 (2 female) 2 older adults aged 65-74 (2 female) 4 children aged 6-16 (4 female)	Game, walking interviews
Community growers on a busy urban street	3 community growers (aged >65, 3 females) 2 visitors[1] (aged 25-65, 2 females)	Storyboarding, walking interview
Farming family (two separate interviews)	1 retired farmer aged >65 (0 females) 1 farmer aged 25-65 (0 females)	Game, interviews

[Table 1: Workshop locations, participants, and activities]

[1] Our five young people did not turn up to this session so two of the team recruited their daughters (one in her 20s, one in her 30s) to join us at the last minute. They did not have any links to the grower group.

During the workshops we used creative activities (games, comic-creation, mobile and on-line interviews, storyboarding, cut-ups and collage) to elicit intergenerational conversation, help articulate intangible values, and explore change. We designed the methods to prompt discussion in a playful and disarming way. Topics of interest were guided by participants, but we aimed to create opportunities to discuss themes such as: moments of change and life-course stories (Shirani et al., 2017); people-environment relationships (Lawton and Nahemow, 1973); (un)sustainable behaviours, consumption and degrowth (Whitmarsh et al., 2021); visions for the future, imaginaries, legacies and aspirations (Leeson, 2015). We were also inspired by Donella Meadows to encourage participants to envision what their sustainable futures would look like. Such visioning is important because, 'If we don't know where we want to go, it makes little difference that we make great progress' (Donella Meadows, quoted in Ragnarsdottir in Kunkel and Ragnarsdottir 2022, p. 133).

Older and younger generations can have different needs with regards to the length and nature of sessions, activity types, timings, and the accessibility of materials. Furthermore, our short research window was beset with unavailable team members and participants due to Covid19 infections and strikes by members of school, university and train unions. We therefore needed to be flexible with workshop formats. For example, for the primary school/residential home workshop, we split the workshop over two days and two locations. On the first day, 12 students from Years Two (6–7-year-olds) and Six (10–11-year-olds) visited a local residential home that the Year Two class already had a relationship with. The next day, the lead author led a comic-creation session in school with the whole Year Six class, who had been studying climate change. This session involved a short presentation about the project before the six students who had visited the residential home each shared with the class something they had learned from or discussed with a resident. After guidance on how to create a comic, students created a one-page comic using templates and suggested prompts (Supplementary Material B).

We also provided a comic creation activity in a quiet break out room at the Centre for Ageing and Dementia Research annual conference and as part of a two-hour MSc qualitative research methods seminar.

Creating the Climate Comic

Workshops were audio recorded and transcribed by professional transcribers, and anonymised where applicable (some participants chose to be represented as themselves in the comic, while others preferred to remain anonymous). Laura was provided with anonymised transcripts, photographs (where consents allowed), information about case sites, workshop summaries and ideas about important themes. We highlighted key quotes and potentially important points or comments

and provided ideas for stories. After reading the transcripts, Laura began to look for two things: emerging themes relevant to the overall project, and comments that could bring a personal, human spark to the story.

Laura wrote the comic in verbatim style, using words directly from the transcripts with minor editing for clarity and to fit within speech bubbles. She worked with the comic format and its physical restrictions to select which details and themes would work together as short stories. For example, each story had to work across a two-page spread and reflect findings from the preferences questionnaire. This meant each story had to be streamlined and focused, both in narrative and visual structure. The design process involved creating rough sketches for each story and then looking at the order in which they might work best in the comic to have a sense of a beginning and an end, introducing narration panels to link the stories. We shared draft comic pages with the advisory group and made changes according to their feedback. Laura used a freehand drawing technique on computer, which allowed her to easily tweak details and made several drafts. After the sketches were finalised, Laura produced the final colour artwork, and team member Aelwyn Williams translated the comic to Welsh. For the second print run, we made amendments in response to feedback on the first version from school children and older people. Changes included, for example, clarifying wording, reducing introductory text, and small illustrative edits.

The resulting *Climate Comic / Comic yr Hinsawdd: Tales between generations / Cenedlaethau'n rhannu straeon* is a bilingual, full colour 28-page comic book. The comic begins with introductory pages about the project, before eight double-page spreads share stories told by workshop participants. On pages 21-24, readers can discover more about the workshop methods and how we made the comic. These pages also contextualise and explain the content: for example, why there is a bee hidden on every page and a duck on the front cover. On pages 25-29, readers can play a dice game, colour-in, and create their own comic using the template provided.

Using the comic to stimulate discussion

We used drafts of the Climate Comic to stimulate discussion at several events. The first was an interactive stand at the Welsh language Urdd Eisteddfod youth festival in Llandovery (mid Wales) in May-June 2023. An Eisteddfod is a festival of music, poetry, and movement, but also a 'sitting together' (Edwards, 2016), the morphemic marriage in Welsh of eistedd (to sit) and bod (to be). The Urdd Eisteddfod is a longstanding, perennial, ambulant, week-long youth cultural event centred on Welsh-language culture, one which regularly attracts 100,000+ visitors. The second was an exhibition held at the Taliesin arts centre at Swansea University during August and September 2023 (Figure 4). During the Taliesin exhibition, notices invited visitors to add a panel to a shared comic, with the

chance to win a £25 book voucher for the best four panels. We provided guidance and captions such as 'meanwhile…', what if...?' and 'well that's a surprise', as well as pens, pencils, and crayons.

Figure 4: Aled and Aelwyn at the Urdd Eisteddfod Welsh Language Festival in mid Wales (top left); children drawing their own comic panels at the OPTIC Exhibition in Taliesin Create (bottom left); the collaborative comic at the end of the two-month Taliesin exhibition (right). Photographs by Merryn Thomas.

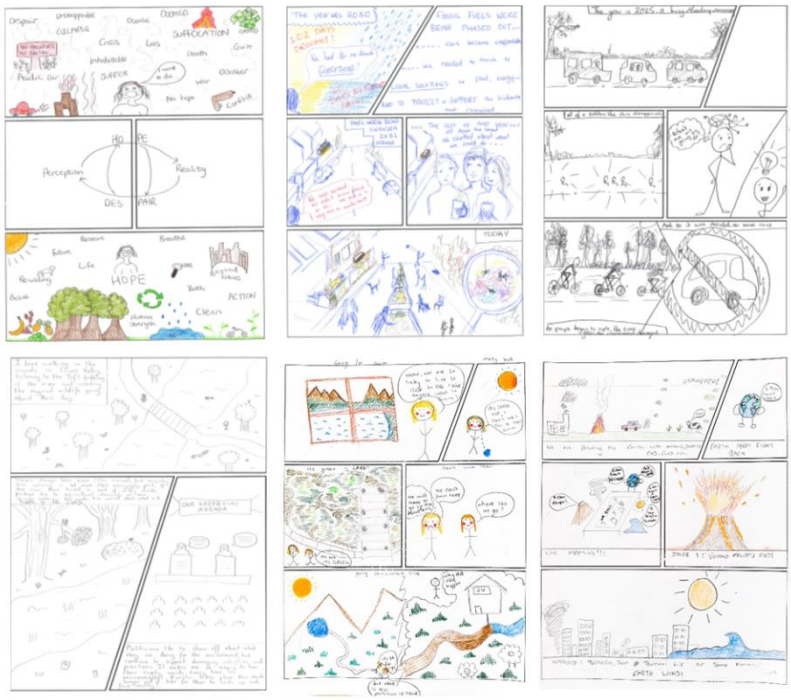
Finally, we used the finished Climate Comic to stimulate discussion in a six-hour shared learning event (September 2023) where workshop participants joined policymakers, businesses, and charities for a discussion and two one-hour design sprints to generate ideas for improving environments for ageing amidst climate change. The design sprints were based on protocols by Jane McDermott (2022) and aimed to generate ideas for how to reach a goal by considering what already works, what the challenges are, and how to overcome these. We drew three broad goals from the Climate Comic to structure the design sprints: communities that live, work, and learn together; healthy land, sea and air for all; streets for people and growing. We used pages from the comic, as well as quotes from the workshops, to set the scene and explain the goals, before guiding participants through steps to find ways to achieve these goals (Supplementary Material C).

3. Findings and discussion

Our comics-based-research approach a) gathered qualitative data, and b) engaged younger and older people with climate change. The following reflections are based on field notes, team discussions, and feedback from participants. Feedback was gathered via email correspondence, discussions and bi-lingual participation questionnaires (N=76), which collate answers from pre-and post-workshop questionnaires (Supplementary Material D and E) and post-event questionnaires (Supplementary Material F).

Gathering stories

We found that the act of drawing a comic was valuable for gathering stories, because participants needed to organise their thoughts into a narrative, choose the most important elements, and consider how to represent them on a page (see Galman 2009). The process also allowed participants time and space to be creative alongside and assisted by researchers, but also separately. For example, one CADR conference delegate (male, 65) stated that he did not like interacting with people and could not draw. But after the researcher drew one of his stories as a comic, he returned twice more to draw his own stories, which had not surfaced in conversation about climate change earlier on. During the MSc methods seminar, students drew a range of comics focusing on sociopolitical drivers, personal climate impacts, feelings, and potential solutions. They used various tools including scene-setting imagery, speech bubbles, sounds and emanata (Figure 5). Though these comics did not feature in the Climate Comic, both cases illustrate the value of giving people time, space and tools to be creative and tell stories.



[*Figure 5: MSc students' comics L-R 'Worst vs best case scenario' (woman, 23); 'The year is 2030' (F, 37); 'And so it was decided' (F, 23); 'Clyne Valley' (M, 23); 'Going for a swim' (non-binary, 21); 'Earth Fights back' (F, 21)]*

In the Year Six comic creation class, comics provided a way to think about, visualise and articulate stories heard during the care home visit, and provided a way to consider alternative realities and futures (Greer, 2020). As one student stated, "cartoons are for thinking about other things." Student comics featured a range of times, storylines, and characters, with protagonists including a football, an alien, and a dog. Notably, all six students who had visited the residential home featured older people as the protagonist, whilst none of the children who had not attended the care home did so. This suggests that spending time with older people rendered their stories more relevant (see Titterington 2020 for a discussion about levels of intergenerational engagement). Residents' stories about snow particularly resonated with the class (Figure 6).

[*Figure 6: The journey from conversation to comic: L-R: care home residents tell stories about their experiences of snow (photograph courtesy of Kirsten Clift); Ronnie and Bob's snow comic; Laura's illustration]*

Engagement and learning

Working with comics sparked interest and conversation. One visitor to the Urdd Eisteddfod asked, "Comics? But climate change isn't funny, is it…?" initiating a discussion about the meaning of comics, and feelings about climate change. Despite such initial scepticism, 95% of respondents to our participation survey (59/62) enjoyed or very much enjoyed taking part (in a workshop, learning event, exhibition). Seeing herself in the comic for the first time, Loz (F, 75-84) said that "it's a privilege" to have her story represented there.

The Climate Comic offers several opportunities for learning. The new Welsh curriculum prioritizes a "strong sense of place" and education tailored to local needs (Donaldson, 2015). Sustainability is a core concept, aligned with the Well-being of Future Generations (Wales) Act (Welsh Government 2015), which places a duty on public bodies to implement sustainable development and highlights the need for a place-based perspective. The Climate Comic can engage students with all six learning and experience themes of the curriculum (see Education Wales and Welsh Government, 2023). First, it offers potential to explore the causes, impacts and mitigation of climate change, contributing to Science and Technology learning. Expressive Arts and Health and Well-being can be explored by colouring the comic, creating one's own comic, or learning about how Laura constructs her illustrations or represents memories. The comic contributes to Humanities through learning about the world, society, and events/practices in the past, present and future. At a basic level, the comic provides opportunities to practice Maths and Numeracy by playing the dice game and counting the bees hidden on each spread. A key contribution is to Languages, Literacy and Communication through storytelling, comics, and haiku poetry (pages 13-14 of the comic).

Importantly, the comic enables the expression of bilingual narratives around climate change. This process began in earnest at the Urdd Eisteddfod event, where researchers heard bilingual narratives

expressing nascent and overt eco-anxiety, tensions over future local actions (e.g., re-wilding, electricity pylons), changes in farming, resource depletion, flooding, drought, mitigation strategies, changes in animal behaviour, attitudes to recycling, travel, waste, and veganism. Such narratives in their telling often conveyed local or national attitudes and information, sometimes addressed micro or macropolitical aspects of climate change, and became fleeting yet valued insights around perceptions and inclinations related to this global issue. Given that the global majority is either bi- or polylingual (Grosjean & Pavlenko, 2021), that this has implications in terms of emotional processing (Sharif & Mahmood, 2023) and that emotions and affect play an important role in shaping human behaviour and decision-making (Lerner et al, 2015), being present at such an event seemed to convey a particular affective intensity. While we glued, pasted, cut things out and coloured things in, we talked and listened in both languages to grandparents, parents, grandchildren, and others. People expressed their feelings and ideas about climate change, however vague or unformed.

Older participants expressed that they learned about climate change, alternative perspectives, and new ways of doing research. Whilst comics provided a familiar way to engage with climate change for several younger participants, comics were more of a novelty for some of our older collaborators. Advisory group member and participant Jennifer Twelvetrees (F, age 75-84) commented,

> *"I think everybody had a chance to show their concerns for the environment, but in a very practical way. That's why it's been really good to see the result of the illustrations with the comic book format. Because I wasn't sure about comics. I grew up in an era when comics weren't particularly something that were educational, and I was really pleased to see what Laura had done, and how she had brought people alive and brought their comments alive but also the environment in which they were making their comment. So, I really like that as well."*

In the residential home, Margaret (90), stated that she knew nothing about climate change. She then met Year Six student Oscar. After over an hour in conversation, Margaret had learned about climate change, and Oscar had learned about Margeret's experiences of the second world war (page 7 of the comic). In another room, Sarah (86) and four students discussed a range of local topics and climate-related issues such as growing their own food. They played the dice game and drew pictures representing Sarah's stories. Later in the project, the learning event showed that the potential of comics extends beyond the stories themselves. Gareth Rees of Amgueddfa Cymru (National Museums Wales) commented:

> *"I thought the way the conversations were captured in the comic was really interesting. In the project that I'm working on, we're currently thinking about how*

we can evaluate its impact and how we can gather participants' feedback in creative ways. Seeing the subjectivity in the comic made me think more about drawing and its use as an evaluation tool for participants."

Limitations of our approach

The suitability of comic creation methods will vary depending on participants' preferences and practicalities such as the time and space available. Participants tended to take around 40 minutes to create a comic page, meaning it may be inappropriate for participants who do not wish to or are unable to take part in lengthier sessions. In our project, residential home sessions were short and uncomplicated to suit the home's schedule and participants' needs, while active farmers did not have time to take part in a workshop. Comic creation was not practical during a walking workshop where there was a fresh breeze and no tables. Another important consideration is that people tend to become absorbed in their comic creation, which can mean less discussion and intergenerational interaction.

It is also worth reflecting on the level of co-creation that we were able to embrace during this short project. We made a conscious choice to only provide members of the team and the advisory group opportunity to comment on the comic in development, due to time constraints and the desire to provide Laura with creative autonomy (Thomas et al., 2021). Future projects could deepen co-creation by involving participants more intimately in illustration and final design (e.g., including participant drawings, editing the comic or commenting on final drafts). However, when budgets and timescales render this unfeasible, having a collaborative author and editorial team like ours is crucial to function as an intermediary between the artist and participants to keep objectivity, inclusivity and representation in check. We were also fortunate to be able to address feedback from readers and original collaborators in our second print run.

Another way to increase levels of co-creation would be for the illustrator to attend the workshops; but this has both benefits and drawbacks. Attending workshops can help Laura get a feel for how people talk about their views and how they relate to the themes and the place, but this does not replace the process she needs in her own time to interpret the transcripts and materials: it is a standalone, creative 'flow mindset'. Furthermore, being able to remain objective is key to balanced inclusion of views, and attending workshops means she listens to only some parts of conversations and unintentionally picks favourite details.

4. Conclusions

We presented the argument for using comics in intergenerational research, drawing on a climate change and ageing project case study. While there are limitations of our approach, we illustrate a variety of opportunities for using comics in both research and engagement with older and younger people.

The act of creating and sharing the *Climate Comic* was valuable for gathering stories, creating space for older and younger people to share knowledge, ideas and imaginaries, and challenging stereotypes that comics -and climate concern- are for the young.

We hope that our work provides inspiration and ideas for using comics for intergenerational research, addressing other social and environmental conundrums in diverse settings and cultures. Our methods may be particularly useful for exploring complex problems in other small nations by fostering co-creation across multiple areas of government responsibility such as climate change, education and ageing, which intersect in practice and in narrative representations.

Future research could also explore how different comic-creation methods work for different groups in different settings, such as using live illustration or collaborative drawing (Galman 2009). Finally, creative methods can have various direct wellbeing benefits (Bungay & Clift, 2010; Stickley et al., 2018) and we would be keen to explore those associated with comic creation, especially for difficult and emotive issues like climate change.

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Conflict of interest statement

The Authors declare that there is no conflict of interest.

Research ethics statement

Ethical approval for this project was granted by Swansea University's School of Health and Social Care Ethics Committee (reference 108948).

Data availability statement

Due to confidentiality, interview files and transcriptions are only accessible to the authors. Materials are provided in the Supplementary information.

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