



City Research Online

City St George's, University of London

Citation: Lyhme, H., Wilson, S. & Barros Pena, B. (2026). Collaborative visual thinking: a qualitative method for research with autistic adults. *Interacting with Computers*, doi: 10.1093/iwc/iwag026

This is the published version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: <https://openaccess.city.ac.uk/id/eprint/37779/>

Link to published version: <https://doi.org/10.1093/iwc/iwag026>

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to [City Research Online policy](#).

Collaborative visual thinking: a qualitative method for research with autistic adults

Helena Lyhme ^{*}, Stephanie Wilson , Belén Barros Pena 

Centre for Human-Computer Interaction Design, City St George's, University of London, London, United Kingdom

*Corresponding author: Centre for Human-Computer Interaction Design, City St George's, University of London, Northampton Square, London EC1V 0HB, United Kingdom.

Email: helena.lyhme@citystgeorges.ac.uk.

Abstract

This paper introduces collaborative visual thinking (CVT) as a qualitative research method designed to engage autistic adults in research about complex and abstract topics. CVT pairs a semi-structured interview with the co-construction of a visual artefact on a collaboration canvas, such as a (digital) whiteboard, based on predefined guiding concepts. The method was developed for a study exploring the personal finance practices of 20 autistic adults. Framework analysis of the transcripts from the research sessions and a feedback survey showed that participants experienced CVT as autism friendly due to the overall process and the visual approach. Challenges revolved around clarity of expectations and sensory demands. CVT offers an adaptable, neurodiversity-affirming approach that invites further experimentation across contexts.

Research Highlights

- Introduces Collaborative Visual Thinking (CVT) as a method combining one-to-one interviews with collaborative visual artefact creation for shared sensemaking with autistic adults.
- Discusses the effectiveness of the method based on a case study with 20 autistic adults.
- Concludes that CVT may be particularly suited to exploring abstract and interconnected topics, but requires balancing of cognitive and sensory demands.

Keywords accessibility design and evaluation methods, visualization application domains, neurodiversity, autism, qualitative research methods

Introduction

Research methods are often designed with neurotypical participants in mind (Bennett, 2023), introducing the need to reflect on and challenge assumptions about how neurodivergent people are included in research, and to reconsider the suitability of existing methods (Maye & Hansen, 2025). This short research paper contributes to this effort by proposing and reflecting on collaborative visual thinking (CVT), a research method developed for collaborating with autistic participants, to explore abstract and interconnected topics in one-to-one settings.

This paper proceeds as follows: we begin by reviewing related work on the need for methodological innovation in qualitative research with autistic adults, and on visual and participatory methods in human computer interaction (HCI) and autism research. We then introduce the CVT method and describe its application in a case study. The findings report participant and researcher experiences of CVT, which are discussed in terms of CVT's role as an interview and

participatory method, as well as its associated challenges. The paper concludes with recommendations and limitations.

Related work

The need for methodological innovation in qualitative research with autistic adults

The neurodiversity paradigm frames autism as an alternative cognitive style, recognizing autistic traits not as deficits but as distinctive patterns of perception, communication, and sensory experience, while also acknowledging the challenges that autistic people face in a neuro-normative world (Guberman, 2023; Spiel et al., 2019; Walker, 2021). Autistic traits vary across individuals, but may include an inclination to deep analytical thinking, attention to detail, preference for predictability, differences in social communication, and heightened sensory sensitivity (Belek, 2019; Milton et al., 2022; Price, 2022).

Received: June 20, 2025. **Revised:** January 7, 2026. **Accepted:** February 18, 2026

© The Author(s) 2026. Published by Oxford University Press on behalf of The British Computer Society.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited.

Autism studies have transitioned from mainly quantitative, medical, biological, and psychological research studies that engaged primarily with autistic children, to more qualitative approaches that incorporate community voices and lived experiences of autistic adults (Nicolaidis et al., 2019). Nicolaidis et al. (2019) emphasize that this transition involves not only shifts in funding priorities but also greater attention to research methods and research approaches. Crane et al. (2021) point out that the qualitative methods in autism research are often used without autism-specific training or relevant expertise. As a result, mainstream qualitative methods, such as semi-structured interviews, focus groups, and observational studies, may fail to incorporate adjustments required for effectively and meaningfully involving autistic adults in research (Crane et al., 2021).

These shortcomings have been addressed by adaptations to standard methods, such as interviews. Nicolaidis et al. (2019) developed guidelines for including autistic adults in research based on three institutional ethnographies of studies with autistic adults. Their guidelines for qualitative interviews highlight the overall importance of clear guidance and communication and include offering participants the option to review materials in advance, asking for anecdotes about specific experiences rather than answers to questions about abstract concepts, and using probes to help anchor events (Nicolaidis et al., 2019). In addition, Maye and Hansen (2025) conclude that more focus should be put on reflecting on techniques and methods in collaboration with autistic people, which this paper attempts to do by reflecting on participant voices.

Visual and participatory methods in HCI and autism research

Qualitative methods in HCI have progressively evolved over time to better represent lived experiences. Traditional structured questioning failed to elicit the complexities of lived reality, which meant that many HCI researchers started innovating their methods (Hwang et al., 2023). One way this methodological innovation has materialized is through the use of visual and creative approaches, including the use of diagrams, drawings, and other forms of visual elicitation.

Positive effects of visual elicitation methods have been studied in neurotypical contexts, e.g., Page et al. (2022) found that images provoked emotive responses, tacit knowledge, and a generally richer narrative. What these visual elicitation methods tend to have in common is that the “visual artefact” is created by the researcher with the intention to trigger thoughts in the participant (Crilly et al., 2006). Some studies, however, have used visual artefacts and design methods in more collaborative ways (Bagnoli, 2009; Kile, 2022; Schepers et al., 2013). Hwang et al. (2023) evaluated a novel method called “Sketching Dialogue” which integrated real-time, collaborative sketching into a semi-structured interview, to document participant accounts, facilitate shared discovery, and provide a tangible visual reference for deeper conversation.

While Hwang et al. (2023) did not use “Sketching Dialogue” specifically with autistic participants, their reasoning suggests that this method is particularly effective in contexts where traditional verbal-only interviews might be limited or challenging. They argue its primary use cases involve navigating sensitive topics, overcoming communication barriers, and facilitating collaborative design exploration. This line of reasoning invites consideration of how visual and sketch-based approaches may support research with autistic participants.

Some autism advocates such as Temple Grandin are positioning themselves as “Visual Thinkers” and highlight how they think in pictures, patterns, and abstractions rather than in linear and verbal ways (Grandin & Lerner, 2022). Lewis et al. (2024) successfully used creative and visual methods to explore the experiences of autistic children. Norris et al. (2020) found in their study about interviewing autistic adults in police, employment, and healthcare that visual-verbal prompting was most effective to support recall. However, Soares et al. (2021) caution against assuming all autistic people think visually, which they did not find to be true in their study, with participants preferring well-structured text over infographics. Rather than indicating a general resistance to visual methods, these findings point to the limitations of researcher-produced visuals and underscore the value of collaborative visualization, in which autistic participants are involved in creating and interpreting visual representations.

Bennett (2023), an autistic researcher, proposes auto-photography and collaborative drawing as methods for meaningful co-creation of knowledge with autistic people. A number of studies have adjusted existing participatory design methods in order to work with autistic people. Soares et al. (2021) and Maye and Hansen (2025) undertook scoping reviews of studies that adapted and involved autistic adults in participatory design methods. These studies tend to use visual and creative methods in group settings with the aim of developing prototypes. In contrast, this work extends participatory visual approaches into one-to-one research settings, focusing on collaborative sensemaking rather than group-based prototyping.

Collaborative visual thinking

This paper introduces CVT as a method for qualitative research with autistic participants. At its core, CVT uses predefined “guiding concepts” to co-create a visual artefact, which helps facilitate a semi-structured interview.

The name of the method highlights two key aspects:

- Collaborative: similar to Hwang et al. (2023)’s Sketching Dialogue, it emphasizes that the method is founded on an ethos of collaboration and co-construction of meaning, rather than one-sided visual elicitation.
- Visual thinking: invoking the idea of visual thinking as a cognitive process in which concepts take shape through abstract imagery (Arnheim, 1969), as well as incorporating the autistic tendency to think in pictures, patterns, and abstractions (Grandin & Lerner, 2022).

Considerations for the development of CVT

Collaborative visual thinking was developed as part of a study to explore the money management practices of autistic adults, acknowledging that the expertise and creative power of autistic people warrant participatory approaches that are built on mutual respect and reciprocity. Based on the research domain and the participants, CVT needed to address the following challenges:

Sensitivity of the subject: Abstract visualization can help with topics that are personally sensitive or intrusive (Hwang et al., 2023), while benefiting from graphic elicitation and ideation (Crilly et al., 2006).

Abstractness and interconnectedness: Hwang et al. (2023) argue that visual methods, such as sketching, are particularly well-suited to mapping out complex systems and processes that make following a rigid set of predefined questions difficult.

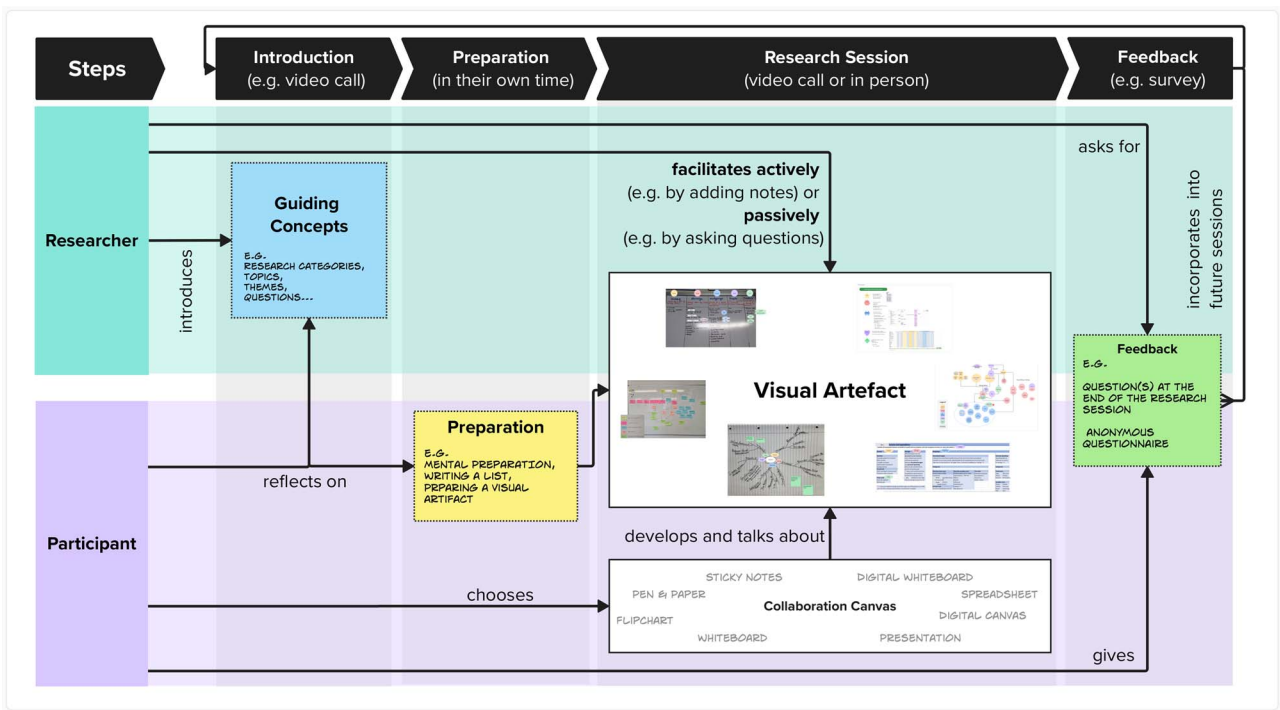


Figure 1 Collaborative visual thinking: Steps and elements.

Autistic preferences: Autistic adults tend to benefit from structured activities, may need additional time to process information, and have a desire to know what to expect (Nicolaidis et al., 2019). This clashes with the nature of a lot of qualitative methods, such as unstructured or semi-structured interviews.

Autistic communication style: Many autistic people are “visual thinkers,” preferring to think in pictures and patterns, rather than primarily in linear and verbal ways (Grandin & Lerner, 2022). Methods need to build on practices that have been developed by and with autistic people (Bennett, 2023; Cheak-Zamora et al., 2017; Rapp et al., 2019).

The double empathy problem: When researchers and participants differ in neurotype, communication challenges can be understood through the lens of “the double empathy problem,” which frames them as mutual (Milton et al., 2022). Hwang et al. (2023) highlight how visualization and sketching may help bridge communication differences.

The CVT method

Based on these considerations CVT was developed. CVT supports semi-structured interviews through the collaborative creation of a shared visual artefact. CVT constitutes a middle ground between a structured interview, which may be inadequate for the exploratory nature of some research topics, and a semi-structured interview, whose indeterminate and loose flow could be uncomfortable for autistic participants. CVT has five elements (see Figure 1) that are added to a semi-structured interview:

- **Preparation:** giving participants advance notice and space to prepare their thoughts in a way that works for them prior to the interview.

- **Collaboration canvas:** a medium on which a visual artefact can be created, e.g., (digital) whiteboard, paper, or spreadsheet.
- **Guiding concepts:** predefined concepts that frame the research. They could be questions, topics, or categories of interest that provide a basic structure for the interview and the visual artefact.
- **Visual artefact:** a co-created visualization based on the guiding concepts, created or extended during the research session using the collaboration canvas.
- **Feedback:** intentional collection of feedback from participants about the method and conduct of the interview, so that the research can be adjusted along the way.

The overall study process is designed to guide participants from initial orientation to active collaboration, considering autistic preferences and giving space for individual adjustments. The CVT process consists of several steps, which incorporate different CVT elements at different times (see Figure 1):

- **Introduction to the task:** Autistic people have a preference for knowing what to expect and not having to deal with sudden changes (Nicolaidis et al., 2019). The introduction to the task should give participants the opportunity to familiarize themselves with the researcher, the tools to be used, and help them decide whether they want to consent to participating in the study. Importantly, at this stage the guiding concepts of the research should be introduced. Additionally, participants should be able to ask questions, discuss their preferred collaboration canvas and access requirements, and the researcher should be ready to adapt to suit individual needs. All this can be done in a short video call.
- **Preparation:** Autistic adults thrive in structured activities and may need some additional processing time (Nicolaidis et al., 2019). This step is about giving participants the opportunity

to prepare in their own time, e.g., by gathering their thoughts mentally, testing collaboration canvas tools, or creating a list of things they want to discuss. Some may also choose to create a visual artefact in preparation that can be further developed in the research session. Preparation time should be accounted for in the compensation. Given that autistic people often engage deeply and thoroughly with tasks, sharing a maximum time-frame for preparation can help set clear expectations.

- **Research session:** The research session is a semi-structured interview organized around the guiding concepts, which provide the basis for the co-construction of a visual artefact on a collaboration canvas. The goal of the session is to elicit thoughts, uncover connections, and facilitate a semi-structured and reflective interview. Working with a visual artefact reduces cognitive load by providing a tangible reference point (Hwang et al., 2023), and can support sensory and processing differences by giving participants additional thinking time. The visual artefact should be visible (and ideally interactive) for both participant and researcher during the session, so that participants are able to shape how their experiences are captured, foregrounding what matters to them (Bagnoli, 2009). A first iteration of the artefact can be created in advance by the participant, or it can be fully co-created during the session. The interview could start with an open question about one of the guiding concepts. The participant's high-level answer should be captured by the visual artefact, which can then be used to dig deeper, e.g., by adding connections between topics, visual representations of emotions, or participant-provided imagery (e.g., a screenshot). The researcher facilitates the creation of the visual artefact either actively, by mapping out the discussion on the collaboration canvas, or passively, by asking questions and commenting on the visual artefact the participant is creating. The visual artefact can use different colors, shapes, and connections, but should aim to stay simple and flexible, so that the focus stays on the conversation between researcher and participant.
- **Feedback:** After the research session, participants should have the opportunity to share thoughts and feedback, so that improvements can be incorporated into future sessions. This is especially important when bridging between different neurotypes. Explicitly inviting critical feedback can help reduce social pressure, particularly for autistic participants who may be concerned about appearing rude based on past experiences (Price, 2022).

Case study

Collaborative visual thinking was developed through a study exploring the financial practices of autistic adults. In what follows, we describe how CVT unfolded in this context, detailing the participants, as well as the process and materials used. All findings regarding the effectiveness of CVT presented in the subsequent sections are grounded in this study.

Participants

We recruited 20 autistic adults (18+) with an autism diagnosis through the *Autistica* newsletter to participate in a study of the money management practices of autistic adults. Selected participants lived in the U.K., had no learning disabilities, were able to communicate verbally, and interacted through a video call. Related to the research topic, participants also had some degree of financial independence,

making decisions about their income, which could come from any source: employment, state benefits, or provided by family. Participants included 11 people who identified as female, 7 as male, and 2 as nonbinary. In terms of age, five participants were young adults (18–30 years old), seven were 31–60 years old, and eight were older adults (61+). They were offered 50 GBP as compensation for 2 hr of their time in the form of a retail voucher of their choice. A full participant breakdown is provided in Table 1.

Study activities

Introduction to the task

To provide an Introduction to the task, potential participants were contacted via email and invited to a 15-min introductory video call with the lead researcher. This introductory call allowed the researcher to provide further details about the study, introducing the guiding concepts, the preparation task, and the consent process. The call provided an opportunity for participants to become acquainted with the researcher and ask questions about the study, while allowing the researcher to learn about participants' preferences and accommodation needs.

To make sure participants felt prepared and comfortable to join the introductory call, the invitation email contained an explicit description of what was to be expected. In the introductory call, a digital whiteboard as a potential collaboration canvas was used to share relevant information not just verbally, but visually (see Figure 2). Important keywords on the whiteboard were highlighted to make skim-reading easier. Muted colors and icons were used to enhance engagement while remaining mindful of potential sensory sensitivities. The content was gradually uncovered so as to not overwhelm people with information. After the introductory call, a follow-up email summarized what was discussed, giving potential participants 3 days to decide whether they wanted to participate in the study.

Preparation

As preparation, participants were asked to collect their thoughts on the guiding concepts of the study, in this case categories related to money management: income, storage, outgoings, people, and technologies/tools. Each guiding concept was accompanied by a set of questions to support reflection (e.g., People: Who is involved in financial practices and decisions?).

To set expectations, participants were told they could prepare in whatever way felt comfortable. Participants were also given the option to prepare a visual artefact prior to the research session with a tool of their choice and given access to a digital "sandbox" whiteboard, on which they could try out the functionalities and decide whether they wanted to use it in the session. To mitigate potential pressures of perfectionism, participants were asked to spend no more than 30 min on the preparation, time that was included in the participant compensation offered.

Research session

Out of 20 participants, 19 chose to do the research session online, and one participant opted for the in-person option. Three participants prepared a visual artefact ahead of the session, with 17 crafting it during the session itself (see Table 1). Throughout the research sessions, three distinct modalities of participant engagement emerged:

- **Participant-led visualization (Figures 3 and 4):** Participants led the visualization activity, using the digital or physical

Table 1 List of participants and their chosen modalities.

Participant	Visualization	Location	Tool
P1	Researcher-led	Online	Zoom whiteboard
P2	Participant-prepared	Online	Excel spreadsheet, Zoom whiteboard for collaboration during the research session
P3	Participant-led	Online	Excel spreadsheet, P3 shared their screen
P4	Participant-led	Online	Zoom whiteboard
P5	Researcher-led	Online	Zoom whiteboard
P6	Participant-led	Online	Zoom whiteboard
P7	Participant-prepared	Online	Mind map on paper, Zoom whiteboard for collaboration during the research session
P8	Participant-led	Online	Zoom whiteboard
P9	Researcher-led	Online	Zoom whiteboard
P10	Researcher-led	Online	Zoom whiteboard
P11	Researcher-led	Online	Zoom whiteboard, researcher shared their screen
P12	Researcher-led	Online	Zoom whiteboard
P13	Researcher-led	Online	Zoom whiteboard
P14	Participant-prepared	Online	Physical whiteboard, Zoom whiteboard for collaboration during the research session
P15	Researcher-led	Online	Zoom whiteboard
P16	Researcher-led	Online	Zoom whiteboard
P17	Researcher-led	Online	Zoom whiteboard
P18	Researcher-led	Online	Zoom whiteboard
P19	Participant-led	In-person	Physical whiteboard and sticky notes
P20	Researcher-led	Online	Zoom whiteboard

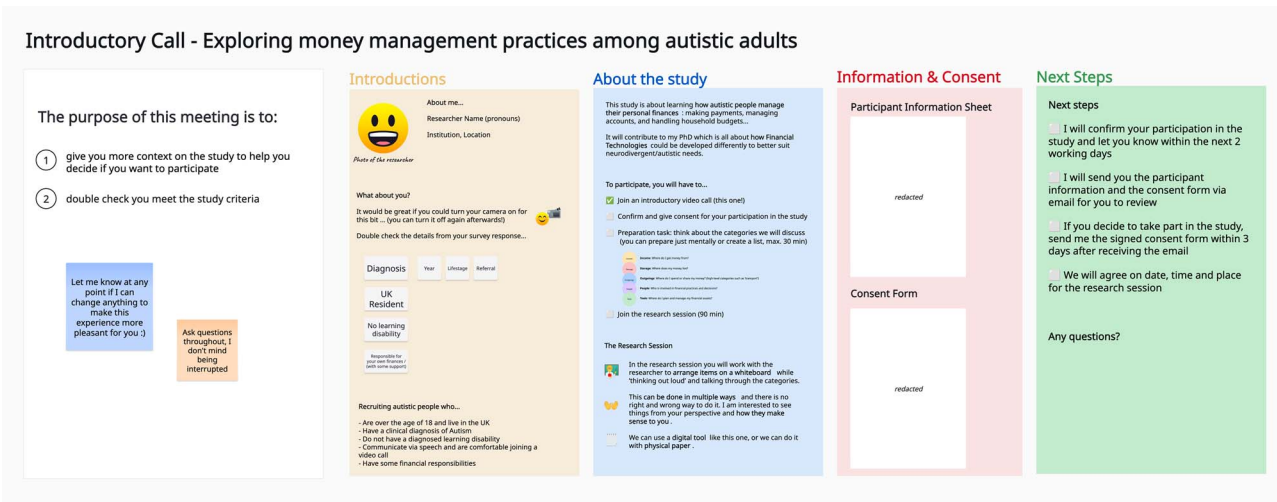


Figure 2 An anonymized version of the digital whiteboard used during the introductory call.

whiteboard to create their own visual artefact. The researcher observed their work and asked questions but did not intervene in the visualization process. Five people engaged in participant-led visualization: P3, P4, P7, P8, and P19. They did so, driven by a desire to express themselves, to be in control of the narrative, or by curiosity about the collaboration canvas, in this case a digital whiteboard tool.

- Researcher-led visualization (Figure 5): Participants talked through the guiding concepts, while the researcher captured what was said on the whiteboard and asked for clarification as needed. This was the most popular modality, chosen by 12 participants: P1, P5, P9–P13, P15–P18, and P20. Participants opted for researcher-led visualization for three reasons: technical challenges, sensory preferences, and lack of confidence.

- Participant-prepared visualization (Figure 6): Participants prepared a visual artefact in their own time prior to the session. During the session, they talked the researcher through their visual artefact, while the researcher asked questions and occasionally added notes to it. Three participants chose this modality: P2, P7, and P14. They did so, in order to sidestep the digital whiteboard chosen by the researcher as the visualization tool and enact their own tooling preferences instead.

Feedback

Toward the end of the research session, participants were invited to provide feedback on the study, either verbally during the session or through an anonymous survey distributed by email afterwards. Out of the 20 participants, 9 filled out the survey. Whenever possible,

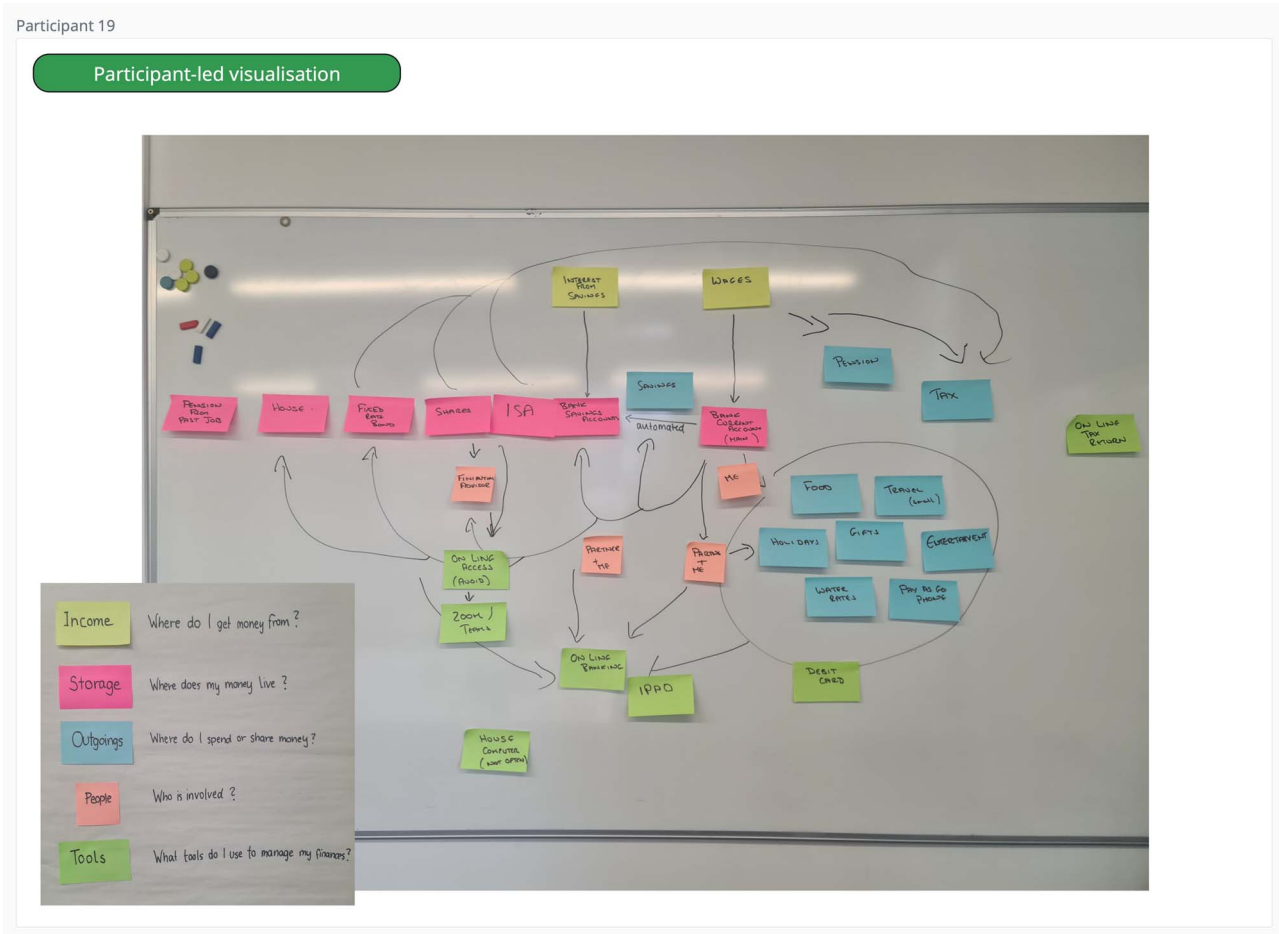


Figure 4 Example of participant-led visual artefact on a physical whiteboard. The guiding concepts and questions are color coded as defined in the legend (left). Participant 19 arranged sticky notes, added connections and boundaries.

the opportunity to test the digital whiteboard, and the freedom to decide whether they wanted to use it. They also felt the scheduled 90 min for the research session was appropriate and enabled “not being rushed and building a rapport with the researcher” (feedback survey).

However, working with “collaboration canvases” such as digital whiteboards also caused difficulties due to cognitive demands, unforeseen errors, and sensory issues connected to working with “the big screen” (feedback survey). In cases where participants were unfamiliar with the collaboration canvas tool, the activity required extra cognitive effort from them. This meant the visual artefact occasionally distracted from the conversation and inhibited participants from talking beyond bullet points. In these cases, finishing up the visualization quickly and turning toward a more standard interview style worked better.

Visual thinking

Participants remarked on the visual nature of the task in relation to autism. Some considered themselves visual learners and thinkers (P10, P19, and P15), or referenced their “associative neurodivergent minds” (P18). Even some of those who did not consider themselves visual thinkers saw value in producing visual artefacts (P4 and P9; feedback survey), e.g., by helping them focus and keeping concepts categorized and organized into sections. In addition, the process of

creating the visualization expanded the time available for participants to think and reflect during the session.

For some, the visualization activity triggered a process of self-reflection, learning, and motivation to work on their personal finances that some described as empowering (P1, P8, and P11; feedback survey). The visual artefact made explicit a mundane subject that tended to remain in the background and to blend inconspicuously with the flow of daily life: “to see them [patterns and behaviors] [...] you know, physically, is helpful because they have always just been thoughts. [...] So thank you. Helpful to have that map” (P11).

Emotional aspects

Beyond catering to autistic minds, the method was also found to be emotionally and intellectually rewarding. Some participants expressed joy and excitement about using creative tools and materials (P6, P5, and P8). Others relished the feeling of being heard in response to researcher interactions with the visual artefact, mentioning frustrations about not being properly listened to in other situations (P1, P3, and P19).

Some participants expressed concerns about “speaking too much” (P1, P8, P16, and P18). In these situations, the researcher tried to reassure participants that getting them to talk was the intention of the activity. Participants also worried about doing “something wrong”

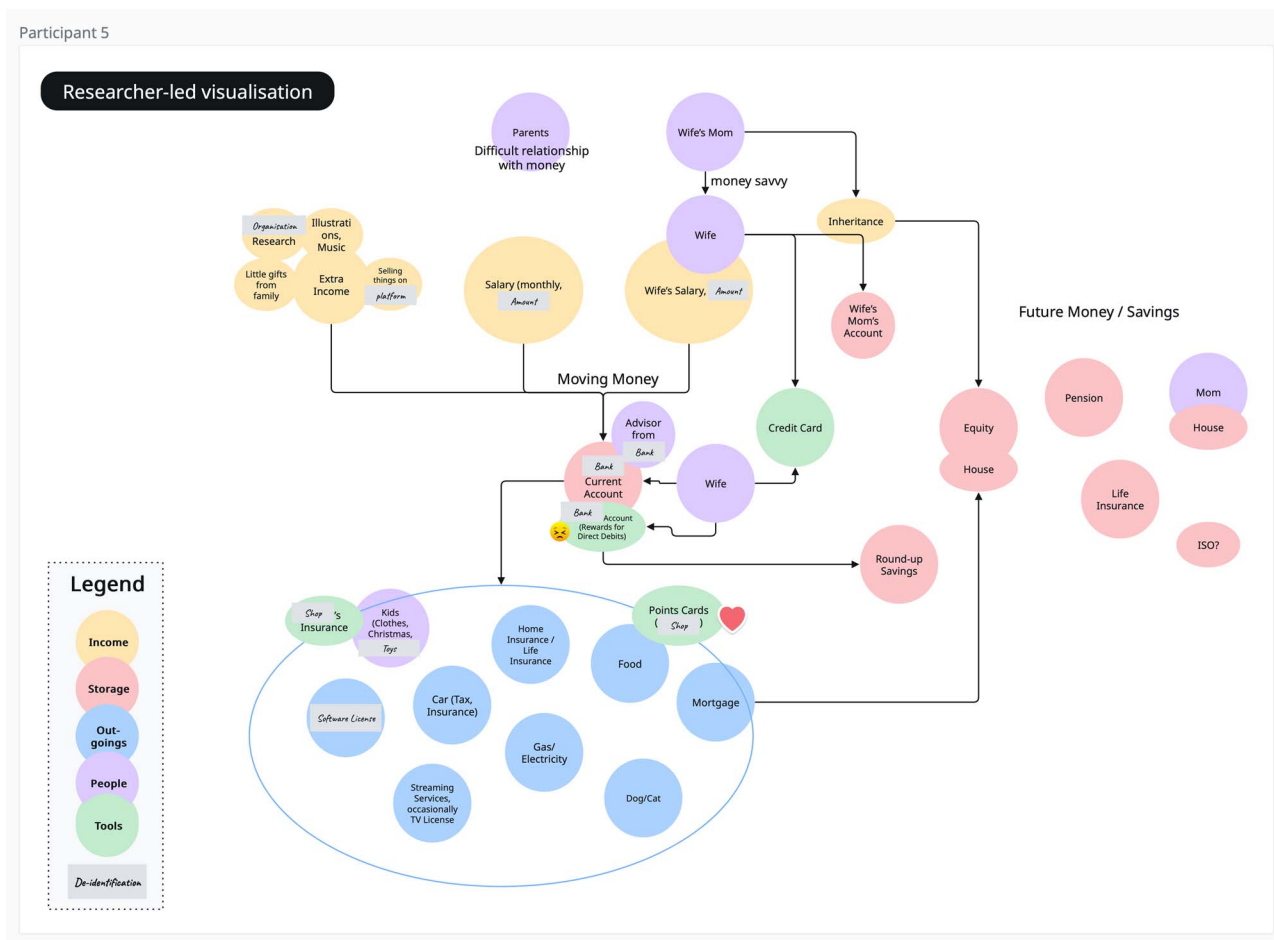


Figure 5 Example of a researcher-led visual artefact. Contributions from the participant were added by the researcher, color-coded by guiding concept connected, and emoticons were added based on the participant's descriptions.

more broadly, which restricted participants' own expression, e.g., with P16 suggesting that the researcher-led participation would “*probably be better for you when you revisit the information*” (P16). Some were also concerned about missing out relevant information. To address this issue, participants asked the researcher to make suggestions during the session (P8 and P18) and emailed corrections, additions and clarifications afterwards (P1 and P9).

Tangible outcome

The visual artefact constituted a tangible outcome from the research activity, something that stayed with the participants after completion. Twelve of the participants expressed interest in receiving a copy of it. Out of those, five shared specific plans to engage with the visualization beyond the session, e.g. plans to show it to others (P5 and P16) or use it for further self-reflection (P1, P6, and P13).

Discussion

CVT as an interview format

The purpose of co-creating a visual artefact was to facilitate a rich conversation between the researcher and participant. To the researcher, the visual artefact acted as a probing tool, helping to refine and confirm information given by the participant. For the

participant, working with a collaboration canvas in the session expanded the time available to think and respond. This is especially relevant to autistic participants who may need extra processing time (Nicolaidis et al., 2019).

In the case of the researcher-led sessions, the visualization also provided tangible proof of active listening and thus may have contributed to participants feeling heard (Hwang et al., 2023). Through the visualization, the researcher was able to nonverbally communicate their understanding of what the participant had said, thereby inviting the participant to make corrections or add further detail. In online sessions, the visualization also served as a way of directing the conversation. By zooming in or out of a certain area, the researcher was able to give non-verbal cues about the direction of the conversation. Having a visual representation of what had already been talked about also helped identify missing items and trigger conversations about associated topics (Hwang et al., 2023).

CVT as a participatory method

One of the aims of the CVT was to make the research participatory and worthwhile for both parties. The guiding concepts helped to provide a flexible and transparent structure that both the researcher and participant could access and refer to. This meant that some participants

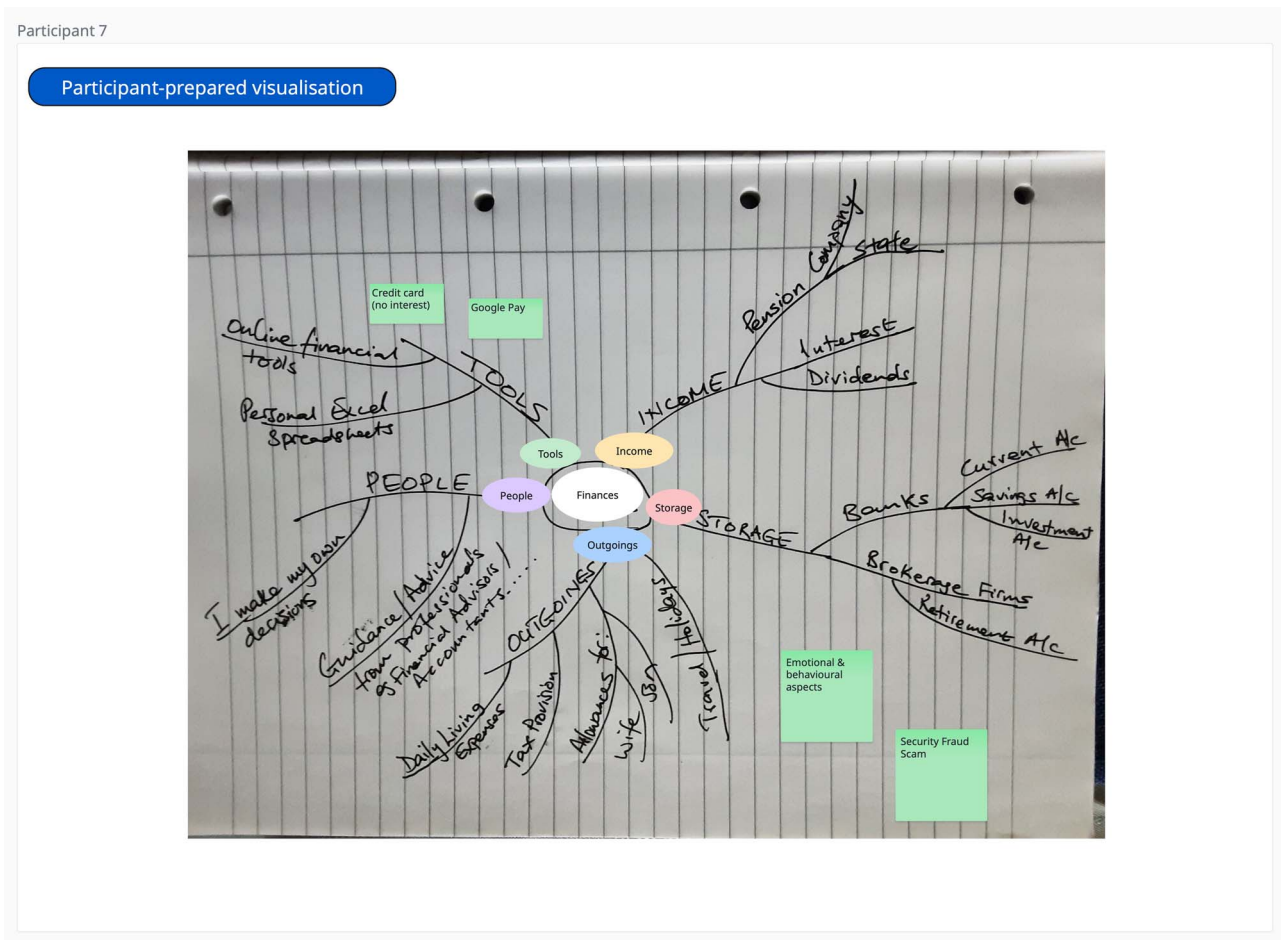


Figure 6 Example of a participant-prepared visual artefact. Participant 7 sent a photo of the paper-based visual artefact, which was annotated on a digital whiteboard by the researcher during the research session.

suggested moving to the next concept when they felt like they were done with the current one or foreshadowing to an upcoming one (“I will talk about this when we get to section X”). This not only addressed the autistic participants’ preference for structure (Nicolaidis et al., 2019) but also changed the power dynamics between researcher and participant, by giving participants control over the narrative, pace, and direction of the session.

In particular the participant-led and participant-prepared variants engaged the playful and creative side of autistic people. Participants were able to bring their way of expressing their perspectives by selecting tools that suited their ways of thinking, by adding or changing categories, or by choosing specific shapes and symbols. In some cases, participants also added screenshots or showed objects through their webcam in the videocall.

In addition, the visual artefact provided a tangible outcome that stayed with participants after the research finished, in some cases helping participants make mundane and inconspicuous aspects of their lives explicit, prompting self-reflection and learning.

CVT challenges

Participant feedback highlighted important tensions introduced by CVT. While the visual artefact provided structure and extended thinking time for many participants, it also introduced moments

of uncertainty about expectations and performance, particularly during the preparation phase. Some participants were unsure what constituted “correct” or relevant preparation, revealing a trade-off between offering open-ended flexibility and providing sufficient scaffolding.

In addition, the cognitive and sensory demands of simultaneously talking, thinking, and visualizing occasionally constrained participants’ verbal elaboration and engagement. Similarly, for the researcher, the cognitive demands of remaining engaged in the conversation while simultaneously constructing and managing the visual artefact requires consideration, particularly in relation to confidence and familiarity with the tools used. These observations suggest that CVT does not uniformly reduce cognitive load but redistributes it.

Recommendations for practitioners

From an HCI perspective, CVT may be particularly useful as a method for exploratory needs elicitation and sensemaking in contexts where experiences are abstract, interconnected, or difficult to articulate verbally. Practitioners can use the co-created visual artefact to surface user needs, values, and breakdowns within existing socio-technical systems, and to reflect on how current or proposed technologies support or hinder everyday practices.

Our findings highlight three areas where CVT can be adapted to support different participants and contexts:

- Offer multiple intensities of visual engagement: Active visual collaboration should be optional rather than enforced. While some participants benefited from actively leading the creation of the visual artefact, others preferred minimal visual interaction.
- Use guiding concepts as scaffolding: Predefined guiding concepts supported preparation and reflection for many participants, but researchers should allow them to be modified or clarified when needed.
- Plan for sensory pacing: Sustained visual engagement was challenging for some participants. Breaks, simplified visuals, or shifting to verbal discussion can help manage sensory load.

These recommendations emphasize that CVT is most effective when treated as a configurable method, responsive to participants' individual needs and preferences, rather than a fixed protocol.

Limitations

A key limitation of this work is that CVT was developed and evaluated within a single study context, focusing on one-to-one interviews with autistic adults about personal finance, which limits insight into how CVT might operate in other domains, or with participants of different neurotypes. In addition, this study did not specifically examine how the neurotype or facilitation style of the researcher may shape the collaborative process. Future research could explore CVT across diverse contexts and configurations to better understand its transferability and interactional dynamics.

Conclusion

This paper has introduced CVT as a qualitative research method for one-to-one collaboration with autistic adults around abstract and interconnected topics. By combining semi-structured interviews with the co-creation of a visual artefact, CVT supports preparation, shared sensemaking, and alternative modes of expression. Findings from a case study on autistic adults' personal finance practices show that CVT was widely experienced as autism-friendly but also introduced some tensions around cognitive and sensory load. These observations highlight the importance of treating CVT as a configurable method rather than a fixed protocol. CVT extends existing approaches by foregrounding collaboration, flexibility and visual thinking in one-to-one research settings.

Data availability

Data cannot be shared for ethical/privacy reasons: the data underlying this article cannot be shared publicly due to the sensitivity of the research topic (personal finance) and the privacy of participants. The data will be shared on reasonable request to the corresponding author.

Funding

This study was funded by a doctoral grant from City St George's, University of London.

Conflicts of interest

None declared

Acknowledgments

We would like to thank all participants who generously shared their time, experiences, and insights. We are grateful to the experts by experience whose contributions helped shape the direction and methods of this research. We also thank *Autistica* for their support.

References

- Arnheim, R. (1969). *Visual thinking* (2nd ed.). University of California Press. <https://doi.org/10.2307/jj.8501063>
- Bagnoli, A. (2009) Beyond the standard interview: The use of graphic elicitation and arts-based methods. *Qualitative Research*, **9**, 547–570. <https://doi.org/10.1177/1468794109343625>.
- Belek, B. (2019) An anthropological perspective on autism. *Philosophy, Psychiatry, & Psychology*, **26**, 231–241. <https://doi.org/10.1353/ppp.2019.0038>.
- Bennett, J. E. (2023) Auto-photography and collaborative drawing: How can autistic researchers foster inclusion through method selection and development to investigate the design of the built environment? *SENTIO*, **5**, 59–68.
- Cheak-Zamora, N. C., Teti, M., Peters, C. and Maurer-Batjer, A. (2017) Financial capabilities among youth with autism spectrum disorder. *Journal of Child and Family Studies*, **26**, 1310–1317. <https://doi.org/10.1007/s10826-017-0669-9>.
- Crane, L., Sesterka, A. and den Houting, J. (2021) Inclusion and rigor in qualitative autism research: A response to Van Schalkwyk and Dewinter (2020). *Journal of Autism and Developmental Disorders*, **51**, 1802–1804. <https://doi.org/10.1007/s10803-020-04634-w>.
- Crilly, N., Blackwell, A. F. and Clarkson, P. J. (2006) Graphic elicitation: Using research diagrams as interview stimuli. *Qualitative Research*, **6**, 341–366. <https://doi.org/10.1177/1468794106065007>.
- Grandin, T. and Lerner, B. (2022) *Visual thinking: The hidden gifts of people who think in pictures, patterns, and abstractions*. Rider.
- Guberman, J. (2023) #ActuallyAutistic Twitter as a site for epistemic resistance and cripp futurity. *ACM Transactions on Computer-Human Interaction*, **30**, 1–34. <https://doi.org/10.1145/3569891>.
- Hwang, E., Kirkham, R., Marshall, K., Kharrufa, A. and Olivier, P. (2023) Sketching dialogue: Incorporating sketching in empathetic semi-structured interviews for human-computer interaction research. *Behaviour & Information Technology*, **42**, 2226–2254. <https://doi.org/10.1080/0144929X.2022.2113431>.
- Kile, M. (2022) Uncovering social issues through photovoice: A comprehensive methodology. *HERD: Health Environments Research & Design Journal*, **15**, 29–35. <https://doi.org/10.1177/19375867211055101>.
- Lewis, K., Hamilton, L. G. and Vincent, J. (2024) Exploring the experiences of autistic pupils through creative research methods: Reflections on a participatory approach. *Infant and Child Development*, **33**, e2467. <https://doi.org/10.1002/icd.2467>.
- Lyhme, H., Pena, B. B., & Wilson, S. (2026). Navigating financial lives: How autistic adults adapt financial technologies, tools and strategies. *Proceedings of the 2026 CHI conference on human factors in computing systems* (pp. 1–13). Association for Computing Machinery (ACM). <https://doi.org/10.1145/3772318.3791131>
- Maye, L., & Hansen, N. B. (2025). Involvement of autistic adults in the participatory design of technology: A scoping review. *Proceedings of the 2025 CHI conference on human factors in computing systems* (pp. 1–17). Association for Computing Machinery (ACM). <https://doi.org/10.1145/3706598.3713961>
- Milton, D., Gurbuz, E. and López, B. (2022) The 'double empathy problem': Ten years on. *Autism*, **26**, 1901–1903. <https://doi.org/10.1177/13623613221129123>.

- Nicolaidis, C., Raymaker, D., Kapp, S. K., Baggs, A., Ashkenazy, E., McDonald, K., Weiner, M., Maslak, J., Hunter, M. and Joyce, A. (2019) The AASPIRE practice-based guidelines for the inclusion of autistic adults in research as co-researchers and study participants. *Autism*, **23**, 2007–2019. <https://doi.org/10.1177/1362361319830523>.
- Norris, J. E., Crane, L. and Maras, K. (2020) Interviewing autistic adults: Adaptations to support recall in police, employment, and healthcare interviews. *Autism*, **24**, 1506–1520. <https://doi.org/10.1177/1362361320909174>.
- Page, J., Broady, T., Kumar, S. and De Leeuw, E. (2022) Exploratory visuals and text in qualitative research interviews: How do we respond? *International Journal of Qualitative Methods*, **21**, 16094069221110302. <https://doi.org/10.1177/16094069221110302>.
- Price, D. (2022) *Unmasking autism: The power of embracing our hidden neurodiversity*. Monoray.
- Rapp, A., Cena, F., Mattutino, C., Boella, G., Schifanella, C., Keller, R., & Brighenti, S. (2019). Designing an urban support for autism. *Proceedings of the 21st international conference on human-computer interaction with mobile devices and services* (pp. 1–6). Association for Computing Machinery (ACM). <https://doi.org/10.1145/3338286.3344390>
- Schepers, S., Dreessen, K., Huybrechts, L. and Laureyssens, T. (2013) MAP-it. The art of designing a participatory mapping method. In *Knowing (by) designing*, pp. 275–281. LUCA School of Arts.
- Soares, M. M., Rosenzweig, E., & Marcus, A. (2021). *Design, user experience, and usability: Design for diversity, well-being, and social development*. (Vol. 12780). Springer. <https://doi.org/10.1007/978-3-030-78224-5>
- Spencer, L., Ritchie, J. and O'Connor, W. (2003) Carrying out qualitative analysis. In Ritchie, J., Lewis, J. (eds), *Qualitative research practice: A guide for social science students and researchers*, pp. 219–262. SAGE.
- Spiel, K., Frauenberger, C., Keyes, O. and Fitzpatrick, G. (2019) Agency of autistic children in technology research: A critical literature review. *ACM Transactions on Computer-Human Interaction*, **26**, 1–40. <https://doi.org/10.1145/3344919>.
- Walker, N. (2021) *Neuroqueer heresies: Notes on the neurodiversity paradigm, autistic empowerment, and postnormal possibilities*. Autonomous Press.