Qualitative visualisation – perspectives and potentials for population geography

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Abstract. The growing influence of qualitative visualisations that support qualitative and mixed methods approaches in population geography specifically open new perspectives for theoretical and methodological developments. Whereas qualitative research using visualisation remains rare when compared to quantitative approaches, several cases of innovation can be identified in population geography. Furthermore, we identified three favourable conditions to potentially inspire new methods of visualisation: the growing relevance of art-based research, an increasing number of transdisciplinary experiences, and the contemporary critical debate on communicating using maps. Based on this diagnosis, we call for systematic experiments and exchange that can inform an intense transdisciplinary academic debate on key epistemological questions, on different approaches to visualisation, and on new tools and techniques to visualise in population geography and beyond.

1 Population geography and the visualisation of qualitative research

The growing influence of qualitative visualisations in qualitative and mixed methods approaches open new perspectives for theoretical and methodological developments in many disciplines. Visualisations are seen to support more diverse, adaptive, and vivid approaches to research analyses and communication. The spread of digitalisation, new tools, and approaches, but also the advancement of epistemological thought related to embodiment and experience, have increasingly made visual aspects more integral parts of geographic research practice, communication, and dissemination (e.g. Strüver, 2019). Moreover, the methodological implications of visuality have been discussed in publications on spatially related research epistemology and methodology, especially qualitative and mixed methods-based research (e.g. Rose, 2016; Schlottmann and Miggelbrink, 2009; Thieme et al., 2019; Kogler and Wintzer, 2021).

Yet, so far, visualisations in geographic research generally have shown a strong bias towards quantitative presentations. The Covid-19 pandemic has further fuelled the role of quantitative data visualisations for communication. This has increased an observed asymmetry: while quantitative research routinely uses graphs to visualise its findings, most publications discussing qualitative research emphasise textual presentations over graphics. In this status quo, a cautious reluctance among geographers (Crang, 2003:500) in using visualisation is apparent, resulting in and, presumedly, resulting from a lack of instructions on and discussions of practices of visualisation in the methodological literature (Cope and Elwood, 2009; Meier Kruker and Rauh, 2005). It comes as no surprise that until recently there was a dearth of literature on respective methods and techniques, especially in the realms of German-speaking geography. The prevalent instructions on how to communicate qualitative research processes and results so far mostly consider text-based presentations (Meier Kruker and Rauh, 2005; Mattissek et al., 2013). A crosscheck on current visualisations in qualitative research publications in the German-speaking community of geography verifies the dominance of text in the presentation of results. Apart from a few exceptions (e.g. Schmidt, 2018; Bittner and Michel, 2018), some rare cases of visualisations in German qualitative geography publications mostly serve as basic orientations or illustrations, e.g. maps for presenting the geographic location of the field studies, photos to por-

tray places or people – but often without further reflection on possible theoretical impacts or epistemological issues.

In the field of population geography, this is no less true as its reliance on quantitative population data has dominated many of its publications. Supported by continuously growing capacities of analyses that come with increasing digitalisation and access to computational techniques and resources (e.g. Van Landesberger et al., 2016; Tan et al., 2018; Yao et al., 2017), these new tools – much to the benefit of scientific inquiry – will support future quantitative analyses and visualisation. However, the past decades have given rise to more qualitative strands of research in population geography, e.g. on migrant subjectivities, on life course decisions (e.g. Bailey, 2009), and many more. Consequentially, Finney (2021) argued quite recently for transitioning the status quo to take up hybrid methods, ultimately extending epistemologies of population geography through the integration of qualitative visualisations in the research process and the communication of results.

This article argues on the basis of examples from population geography, that first, approaches of qualitative visualisation possess specific methodological potentials that may enhance population geography's toolbox of communicating its findings. Second, we will demonstrate that this move towards qualitative analyses and visualisation has already started – yet scattered and unsystematically. Third, we discuss current conditions for implementing qualitative visualisations in research. And fourth, we will argue that a systematic discussion of different approaches needs to happen.

2   Qualitative visualisation – current relevance and potential for population geography

Quite recently, population geography's bias towards quantitative analyses has been prominently commented on by Finney (2021:578), mentioning a popular strand of representing spatial distribution, prognosis, and population patterns and movements (Finney, 2021:578f.). This critique complements Presti's (2020:914) earlier argument related to quantitative migration research that the "mathematical and cognitive conception of movement contrasts the humanistic and processual understanding of the relationship between space and mobility". Though such criticism may appear overly broad, we can easily find examples from population geography where a focus on quantitative methods and visualisation may restrict the potential of scientific insight.

For instance, Meyer and Leibert (2021) conclude that new formats of representation are needed that do not reduce the complexities of qualitative findings. Their article provides an example from migration research: often based on socio-psychological, socio-theoretical, and psycho-analytical literature (e.g. Meyer and Miggelbrink, 2013), recent approaches to migration attempt to understand the subjective mechanisms influencing individuals to consider and/or execute acts

of migration. While not being able to reconstruct large-scale dynamics, such approaches are able to contextualise individual acts and gain an understanding of the psychological and societal mechanisms at play. Such aspects can hardly be grasped with quantitative methods and corresponding visualisations (see Meyer and Leibert, 2021). Turning to qualitative methods on the other hand usually bears the risk of being caught in textual descriptions of actions, quotes from respondents, and sometimes repetitive explanations of the theoretical foundations of the analysis. Though such endeavours are devoted to communicating the complexity of the social and subjective aspects in migration, they are limited in creating comprehensive ways to communicate their research in a way that connects more easily to the complexity of everyday lived experiences and emotions, especially for non-academic audiences.

Another example concerns population dynamics on the basis of demographic developments under certain political and social conditions. After decades of research on demographic transitions (Thompson, 1929), most geographers are familiar with population pyramids for different places. When studying the reasons behind the visualised social structures, geographers have turned to qualitative research on life courses, households, family and gender relations, marital relations, and wider social structures (e.g. Buzar et al., 2005; Bailey, 2009). Yet, these studies have by far not been able to reach a comparable visibility of their mostly narration-based data and results in comparison to pyramid graphs. More recent work points to the viability of hybrid approaches, including the use of a variety of qualitative visualisations, to develop better insights into population dynamics (Jung, 2014) and multiple-scale data sources (Yao et al., 2017).

Given the potential of qualitative research to illuminate complexities of e.g. subjective reasoning or social negotiations, both examples illustrate how contemporary approaches in population geography are able to contribute novel perspectives, yet struggle to given their reliance on text as the mode of communicating research. Visualisation – here – may help communicating the research process and its findings, their complexity, and special focal points to specific academic and non-academic audiences (Vrkljan et al., 2021). Visualisation is, thus, not only another representation of research and cannot, per se, avoid the trap of reducing the complexity of research findings (Van Houtum and Lacy, 2020). It is, instead, a consciously deployed tool to make qualitative topics and findings more comprehensible and create public visibility for the answers that particularly qualitative research may provide in population geography.

Population geography has already experienced a rising share of qualitative methods (e.g. Skop, 2006; White and Jackson, 1995) which has also stimulated reconsiderations of how to visualise population research data. In addition, there is a growing awareness for the ability of creative visualisations to provide new insights and theoretical depth that complements epistemological approaches to address population

geography questions, e.g. "Exploring Mental Mapping as a Feminist Visual Methodology" (Jung, 2014) or combining GIS with qualitative data collection (Kwan, 2002b) for studies of migrant women. In this context, Finney calls for more approaches that combine qualitative and quantitative analyses to explain and contextualise quantitative datasets (Finney, 2021:580f.). This corresponds with recent critical analyses of common mapping conventions in "digital migration studies" (Allen, 2021, also Van Houtum and Lacy, 2020), that impactfully re-structure the representation of migration. Whilst Finney (2021) ultimately suggests approaching the topic of inequality using a mixed methods approach, we do find contemporary attempts of qualitative analyses – and correspondingly, visualisations – in population geography: for instance, Jovicic (2021) uses an analysis of visual representations of migrants in newspapers, Torfa et al. (2021) use so called Net-Maps for the structure of e.g. on influential factors of migration, Buckle (2020) discusses the potentials of qualitative GIS for migrant research, and Presti (2020) presents several innovative approaches to mapping migrant realities (also Rossetto and Presti, 2020).

This demonstrates that the toolbox of population geography has already broadened, yet the examples are comparably isolated cases that are still outnumbered by quantitative visualisations. And in concordance with Finney (2021), we do need to ask what amount of knowledge may be overlooked by remaining buried deep in text-laden articles that strive to articulate the complexity of the social, yet often under-utilise contemporary methods of communicating their research and shedding light on qualitative strands of population geography. Bringing quantitative and qualitative visualisations together by advancing the qualitative toolbox could give impetus to new understandings, new attention, and new mixed methods approaches that bridge the paradigmatic gap. We should recall the theoretical and methodological diversity of population geography which speaks for mixed methods and qualitative visualisations as "population geography has no one theory, methodology, or, for that matter, definition" (Woods, 2013). Questions of visualisations within the realms of population geography will always need to be discussed from a number of epistemological directions.

3 Conditions for moving forward with visualisation in qualitative research

Qualitative geographical research approaches, while generally growing in popularity, have immensely diversified over the recent past. Some contemporary approaches have moved beyond studying discursive representations and increasingly include the analysis of visuality and lived experiences, assemblages, affective, emotional, and embodied aspects – a development that Crang described already in 2003 with the words "touchy, feely, look-see" (Crang, 2003; Schurr and Strüver, 2016; Rose, 2016). While text (and audio turned

into text, respectively) remains the prevalent mode of communicating qualitative research, it however has ceased to be the only mode. Furthermore, the material of analysis and results also changes. Questions arise on how to include relevant video footage within scientific papers, how to document emotions and embodiments of both research participants and researchers themselves, and how to grasp and visualise experiences and implicit knowledge in adequate ways (Meyer et al., 2018). Bearing such trends in mind, we consider three favourable conditions for the future potential of qualitative research visualisation.

The growing role of art-based research: with geographers increasingly being able to partake in conference sessions or workshops on visual and interactive field methods, an increasing number of scholars elaborate on the potential of artistic contributions for spatial research (e.g. Nöthen, 2017). With this emerging field of artistic research, the potential of art in negotiations of social and spatial arrangements, and of its power to give impulses and to integrate a variety of actors seems promising (Hawkins, 2013; Van der Vaart et al., 2018) to bridge the gap between societal groups, generations, and cultures (see e.g. Askins and Pain, 2011) – which makes art especially valuable for exploring new forms of communicating research. And with the performative turn having suggested to prefer dance and enactment over interviews and group discussions already a decade ago (e.g. Dirksmeier and Helbrecht, 2008), theatre plays and dances have indeed entered the scientific community as a way of communicating ideas (e.g. conference of New Cultural Geography in Freiburg 2018, a play on the ideas of Donna Haraway; or the annual "Dance your PhD" contest held by the American Association for the Advancement of Science; https://www.sciencemag.org/projects/dance-your-phd, last access: 25 August 2022).

An inspiring potpourri of experiences from other disciplines: qualitative research in other disciplines (e.g. anthropology, sociology, visual culture studies) already provides insightful findings that can be combined with approaches of visual communication (e.g. graphic design, infographics). In these fields, we may discover examples of debates on epistemological and methodological questions of visual representation that could help us tackle e.g. questions of perception and cognition (e.g. in emerging fields such as visual sociology, see Chandler et al., 2015). In the international geographical debate, such engagements, while sporadic, have occasionally been related with geographic aspects (see e.g. Crang, 2003; Rogoff, 2000; Vich et al., 2017; Dodge et al., 2009).

A new critical debate on geographic communication with maps: specifically, the relevance and underdevelopment of maps for qualitative research has begun to be discussed in critical and qualitative GIS (Schuurman, 2012; Mennis et al., 2013; Kwan, 2002a; Bittner and Michel, 2018; Cope and Elwood, 2009). Here, as Kwan argues: "the representational possibilities of GIS can be used for enacting creative discursive tactics that disrupt the dualist understand-

ing of geographical methods where visual images, words, and numbers are used together to compose contextualised cartographic narratives in geographical discourse" (Kwan, 2002a:272). Taking advantage of GIS' abilities to "take into account certain complexities of an urban environment" (Kwan, 2002b:654) and combining it with a critical social scientific approach, critical GIS can be used to literally draw our attention to societal conditions inscribed into the spatial environment. Prominent examples can be seen in established participatory mapping approaches that engage with marginalised communities (e.g. counter-mapping with indigenous groups), and mapping as a tool to gain a different sort of knowledge and data. These developments have raised questions about new materialities and socio-technical pre-structuration of knowledge production (Caquard, 2015; Gerlach, 2015).

While these three conditions may inspire developments of representations of qualitative geographical research, we also have to pay attention to the epistemological and methodological challenges involved (see Elwood and Mitchell, 2013):

– How can we translate the complexity and spatiality of qualitative research (data) into concrete visualisations?

– How straightforward or complex is the integration of visualisations within presentations of qualitative research?

– Which audiences require certain forms of visualisation?

– For which purpose are they made and what advantages and challenges do they entail?

While the three favourable conditions may suggest that qualitative visualisation is on the brink of a breakthrough, attempts to answer these methodological and epistemological questions have remained scattered, surfacing time and again, yet not being tackled cohesively. We argue that based on this diagnosis, a lack of systematic theoretical and methodological debates in qualitative research in general, and geography in particular, has to be concluded, calling for systematic experiments and exchange that can inform an intense transdisciplinary academic debate on key epistemological questions, on different approaches to visualisation, and on new tools and techniques to visualise. With a general increase and spread of such knowledge and creative discussions of its bespoke application in subfields of geography, visualisations can be a fertile ground for innovative ways to overcome the quantitative bias in population geography and beyond.

4   Perspectives on the future of qualitative research visualisation for population geography

Based on the aforementioned lacks and conditions, we concluded the need for an engagement with the visualisation of qualitative research processes and findings that tackle the questions of how to visualise qualitative research and data. Population geographers have begun to address paradigmatic, epistemological, and methodological aspects, and engage the following fields in a systematic manner – as shown in chapter two. Yet, a more thorough theoretical and methodological debate on the visualisations of qualitative geographical research has to be established with regard to their possibilities versus their epistemological challenges. This should consider the many roles of visualisations in population geography, interdisciplinary inputs, and experiences as inspirations.

For instance, a systematic debate of examples and approaches of visualising qualitative research in the context of hybrid methodology developments (e.g. Finney, 2021) would serve the consolidation of what is currently used and innovated. *More examples have to be collected* and brought into the discursive development of the field. At the same time, *specific approaches should be assessed* in regard to the concepts and methods used, their challenges and benefits, and the complex amalgamation of epistemological and methodological issues that support analysis and enhance communication of results. Given the complexity of qualitative research data, *methodological transdisciplinary experiments* need to be conducted that seek to adapt prevalent approaches of visualising quantitative data and that also dare to appropriate new accounts of approaching political and culturally sensitive topics. Here, *experiences from artistic work should be considered*, which have been extremely rich in its evocative representation of changing societies and culture. Current engagements with science and technology studies, new materialism, emotional geographies, or methods of embodiment could help to advance the networks engagement in visualising qualitative geographic research.

These steps need coordinated spaces to discuss, experiment, and bring experiences together. Next to opportunities as scientific working groups (e.g. the AK Qualitative Methoden in der Geographie und raumsensiblen Sozial- und Kulturforschung) or places as the mLAB in Bern (Thieme et al., 2019), we have established the network "Visualising qualitative geographies" with the goal to discuss and experiment with novel ways of visualising qualitative research processes and findings. Through such an endeavour, new ways could be found to not only answer to an urge to better present, represent, and empower qualitative research for future research and publications within geography and the spatially related scientific community, but also to answer the growing call for intensified communication with wider societal groups. Therefore, the continuation of this exchange will bring forward ideas for more diverse, adaptive, and vivid research visualisation for qualitative researchers. Population geography will not just profit from this process; instead, with its long-lasting tradition in being a very visible and visualising subfield of geography, it also has the potential to be a driver in the process, enhancing its ways in developing theories and methods for diverse matters such as population development, demographic transitions and its societal conditions, or a fair

and socially bearable way of migration management – matters that need attention and visualisation around the world.

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