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Factors shaping cartographic representations of inequalities. Maps as products and processes

Javier Martínez [a, *], Karin Pfeffer [b], Isa Baud [b]

[a] University of Twente, Faculty of Geo-Information Science and Earth Observation, Hengelosestraat 99, 7500 AA, Enschede, The Netherlands
[b] University of Amsterdam, Amsterdam Institute for Social Science Research (AISSR), Nieuwe Achtergracht 166, 1018 WV, Amsterdam, The Netherlands

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ABSTRACT

This paper analyses factors shaping cartographic representation of inequalities and discusses new forms of deprivation mapping. A heuristic framework with three dimensions shaping representations of inequalities is built, using examples from cities in the global South and North. Dimensions include the framing of inequalities, sources from which knowledge is produced, and geographic scales to which information and analysis refers. This framework is combined with a discussion on the genealogy of map production and use, in order to assess the extent to which maps can be catalysts for equitable social change. Results show that an approach recognizing the multi-dimensionality of spatial inequalities, combining different knowledge sources and including critical awareness of existing geographic boundaries at different scales and their limitations, is necessary to interpret maps well. We suggest that a hybrid approach integrating the three dimensions which reflect how major choices are made, provide a more holistic understanding of how urban poverty maps are produced. The potential transformative power of maps lies in being catalysts for discussions and stimulating debates.

1. Introduction

Spatial analysis and visualisation of poverty and multiple deprivations in urban areas is receiving increasing attention (Alkire, Roche, Santos, & Seth, 2011; Harris & Longley, 2004; Noble, Wright, Smith, & Dibben, 2006). Such interest relates to a need to better understand and make visible spatially unequal and unjust living conditions and the processes that generate poverty. Such analysis can support civic organisations and policy makers in their struggles against spatial injustices.

These studies emphasize the importance of spatial analysis in describing and representing unequal conditions and spatial (in)justices (Soja, 2010) for several reasons. The first concerns the concentration of deprivations within lived spaces, in which social groups experience varying and multiple dimensions of poverty and inequalities (Du Toit, 2005; Narayan, Chambers, Shah, & Petesch, 2000; Sen, 1999). The second concerns how varying scale levels in spatial representations can influence results and interpretations; the rationales behind choices in mapping need to be recognized. The third concerns the 'transformative power' that the resulting maps can have over space (see e.g. Monmonier, 1991; Scott, 1998); they have the capacity to highlight or ignore existing unequal conditions depending on what information and knowledge they incorporate.

Our assumption is that maps are temporary products in iterative mapping processes, in which the knowledge embedded in maps is relationally constructed, exchanged, contested and utilized for decision-making in various contexts (Du Toit, 2005; Kitchin, Gleeson, & Dodge, 2013). This requires us to deconstruct the decision-making behind maps as products to understand them, and to analyse the ways deprivation and inequality mapping are contested and reworked in mobilisation processes designed to produce less unequal urban environments. Digital technologies and social media supporting collective forms of data production and representation (Elwood, Goodchild, & Sui, 2012; Hoyt, Khosla, & Canepa, 2005) make understanding such *mapping practices* even more imperative to realize their potentials and recognize the pitfalls in shaping representations of inequalities (Patel, Baptist, & D'Cruz, 2012; Wilson, 2011).

In this paper two questions are considered. The first concerns the potential of mapping to represent geographies of deprivations and inequalities in cities. We do this by analysing how the following issues shape the mapping of poverty and deprivations; (1) the framing of the poverty and deprivations visualized; (2) the sources from which knowledge is derived; and (3) the geography, representation and scale levels to which such information and analysis refer. Although each of these factors has been discussed

* Corresponding author.
E-mail addresses: j.martinez@utwente.nl (J. Martínez), k.pfeffer@uva.nl (K. Pfeffer), i.s.a.baud@uva.nl (I. Baud).

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individually in the literature, few attempts exist to analyse them in an integrated manner.

The second question relates to 'mapping processes and practices', specifically (1) the iterative genealogy of map production; and (2) the way maps produced are used, travel, and become contested (cf. Kitchin et al., 2013).

For both questions, we utilize experiences in India, Argentina and the Netherlands where we have been involved in poverty and deprivation mapping research during the last 10 years (Baud, Sridharan, & Pfeffer, 2008; Martínez, 2009; Pfeffer, Deurloo, & Veldhuizen, 2012). In answering the first question, we develop a heuristic framework to consider the three issues concurrently. For answering the second question we analyse the *processes* through which the deprivation maps were constructed, presented, utilized and stimulated discussions in various (international) networks.

We recognize this study of *practices* as an initial approach. This study did not involve in-depth analysis of practices, which would have required an anthropological approach, continuous observations, precise depictions, and narratives of the detailed accounts of the production and uses. It is based on a self-reflective examination of the experiences in which we were involved, acting as an ex-post analysis of the three cases. Hence, we move beyond the mere study and presentation of poverty maps as products. Informed by existing theoretical debates in the field of critical cartography and human geography, we identified, distilled and made explicit within those practices the integration of knowledge, the emerging context, the actors involved, and disseminations.

2. Theoretical backgrounds

Knowledge generation in our perspective is considered a socially embedded process, in which different types of knowledge are incorporated (van Ewijk & Baud, 2009). These range from embedded knowledge based on practice (professional, community-based, experiential) to scientifically generated knowledge (following specific methodological protocols). The implications of starting from a 'social construction of knowledge' perspective are that we acknowledge that the ways issues are framed, the sources of information used, and the geographic scales considered, are choices which reflect current understandings of an issue rather than being absolute truths. Therefore, it is essential to have an understanding of the implications of those choices before accepting and interpreting the resulting visualisations (Monmonier, 1991). This we deal with in section 2.1.

It also implies that maps as products are part of an iterative processes of societal discussion around the ways issues are framed, the information accepted and the boundaries of visualisation. The discussions on the under-estimation of 'urban poverty', the recognition of multi-scalar processes affecting cities (assemblage, configuration, urban metabolism), and the increasing use of community-based mapping of information illustrate how the production of maps is shifted in new directions (Baud, Pfeffer, Scott, Denis, & Sydenstricker-Neto, 2014; Baptist & Bolnick, 2012; Satterthwaite, 2004).

2.1. Mapping poverty and deprivations: framing, sources of information and spatial representation

Issues of poverty and deprivations have been conceptualized historically in varying ways. In our study we concentrate on current discussions of urban poverty and deprivations across the global North–South divide. We unpack poverty and deprivation mapping, focusing on the three issues framed in the first question; specifically, the conceptualization of deprivations, the 'sources' used in the mapping process, and the spatial representation at various scale levels. We conclude by setting out a framework integrating these issues, which allows researchers to recognize where their maps 'figure' along the axes A, B and C of Fig. 1.

A) Framing poverty and deprivations

Discussions on deprivations, poverty, and inequalities range from one-dimensional measures of income and consumption through multi-dimensional measures combining income, life expectancy and education measures (HDI),[1] gender differences (GDI),[2] to discussions on the structural deprivations and degrees of agency within households to deal with structures of constraints, reflecting lack of access to collective resources and denials of respect and autonomy (Baulch, Wood, & Weber, 2006; Sen, 2006). Whereas the former utilize indicators, the latter provide insights into underlying processes of structural constraints and household agency to counter them (cf. Du Toit, 2005; O'Connor, 2001).

One-dimensional approaches (poverty line, headcount index, Gini coefficient) are widely used for comparing and monitoring situations across different administrative, political and geographical areas. Multi-dimensional approaches pull strategic dimensions together at similar scale levels, choosing dimensions informed by well-being models. The recently developed Multidimensional Poverty Index or MPI (Alkire et al., 2011) combines education, health and standard living conditions in one index, computed from household survey data for comparing national situations. Various versions of Indices of Multiple Deprivations (IMD) combine household assets and individual attainments with collective provision in habitat and collective infrastructure to capture geographic disparities at regional and local levels (Baud et al., 2008; Noble et al., 2006). These framings incorporate material and immaterial dimensions, linked to the well-being and capabilities approaches, based on qualitative fieldwork research which recognizes households' livelihood strategies and struggles as well as intra-household inequalities related to gender and generation (Baud et al., 2008; Van Dijk, 2014). Such framings provide measurement criteria based on understandings of structural processes producing poverty. Community mapping approaches combine local framings of deprivation and well-being with participatory methods of data collection (Hoyt et al., 2005; Patel et al., 2012).

What is not yet reflected in such approaches are ways in which institutions structure geographic and social spaces and their effects on inequalities within cities; struggles against such inequalities have been captured under the heading of 'rights to the city' approaches (Baud & Nainan, 2008; Lefebvre, 1991; Nicholls, 2003; Soja, 2010).

In practice, in particular in urban policy and development programmes, sub-standard settlements or slums are often equated with high levels of deprivations (Baud et al., 2008; Davis, 2006; UN-HABITAT, 2003). Such settlements are assumed to have poor living conditions, irregular and dense structures, poor housing structures and lack of basic services. Different definitions are used to delineate 'slums' (as area) and even within the same locality different sets of criteria are used by actors, resulting in multiple representations of what a slum is and where it is located (cf. Richter, 2014).

The *variety of approaches and dimensions* reflects discussions on what constitute deprivations. Whereas economists and national governments prefer to use consumption data converted to prices, anthropologists and sociologists prefer dimensions defined by households themselves (Krishna, Kapila, Porwal, & Singh, 2003;

[1] The Human Development Index (HDI) measures three dimensions: having a decent standard of living, a long and healthy life, and being knowledgeable. http://hdr.undp.org/en/content/human-development-index-hdi.

[2] The Gender Development Index (GDI) measures gender gap in the HDI dimensions.