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Streets for co-presence?

Mapping potentials

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Abstract

In times of increasing residential segregation in cities the potential for interplay between local inhabitants and non-locals in urban public space becomes increasingly important. By sharing space we gain information and knowledge from our fellow citizens (Granovetter, 1983), and are enabled to participate in processes that negotiate social structures, attitudes, norms and acceptable behaviours (Giddens, 1984; Zukin, 2005). From this point of departure streets as well as local squares and centres appear to have a key role providing an arena for interplay between different social groups and an arena for exchanging information and are seen as crucial for providing access to opportunities and various urban resources (Young, 1996). Many neighbourhoods, however, have proved to fail in this respect and in areas that today face problems related to social exclusion in Sweden the streets are often characterized by co-absence rather than co-presence and there is an evident ruptured interface between locals and non-locals (Legeby, 2013). We argue that patterns of co-presence to a large extent are influenced by urban form and by the morphological properties that also is related to what kind of non-residential activities are likely to emerge locally. This paper aims to highlight the critical role of public space and demonstrate how configurational properties may be analysed and described so that it becomes clear if and where urban design interventions can be used in order to create more favourable conditions and improve access to both various urban resources and to an urban life with a mix of locals and non-locals. In a project conducted in collaboration with the city of Gothenburg seven neighbourhoods are analysed according to the potential for co-presence in public urban space, and according to access to urban resources; two aspects identified as highly relevant from an urban segregation perspective. This paper uses a three pronged approach that combines configurational analysis, accessibility analysis and observations, and various diagrammatical representations of the results are presented. The findings establish that several of the neighbourhoods prove to hold unfavourable conditions as a result of their spatial configuration. Nevertheless, the study illustrates a way forward whereby public planning can be supported by socio-spatial analysis and more accurately operate by using urban design to reach more equal living conditions and overcome social exclusion.

Keywords

Co-presence, public space, share space, social exclusion, urban segregation.
1. Introduction: equal living conditions in relation to segregation

As a counteraction to social segregation and exclusion, the local government in Gothenburg, Sweden, has declared that the unequal life chances found in the city need to be levelled out. In particular, the relatively poorer conditions found in districts that today are disadvantaged from a socio-economic perspective are of great concern. In spite of far-reaching efforts and anti-segregation initiatives during four decades within these suburbs the situation remains highly problematic. Strategies including architecture and urban design have mostly been confined to what has been described as a problematic homogeneity of housing types and a problematic homogeneity in letting and ownership. We suggest that anti-segregation initiatives would benefit from interventions that include changes of urban form and its configuration, since research confirms that this has importance for street life and for what kind of non-residential activities are likely to emerge. This in turn influences what resources will be available locally that define the living conditions and whether various resources are equally distributed across the city or not. There is no unanimous understanding today of the role of architecture in relation to social segregation and it is debated to what extent urban design interventions can make a difference. However, in recent urban design research the importance of the everyday urban spaces is emphasised since it is here various social processes decisive for integration processes take place. With whom we potentially share the street and what is within easy access as we go about our day-to-day routines is crucial for matters related to social exclusion. Thus, the street stands out as an important arena for interplay between citizens including processes of recognition of ‘the other’ and information exchange.

This study is part of an initiative implemented in the city of Gothenburg where academic and local expertise is brought together to counteract barriers to understanding patterns of space use. It builds on research where urban form is found to play a critical role for both social processes as well as for how resources are distributed across the urban landscape. This research project identifies and describes affordances that are relevant from a social perspective in a comparative manner. The overall aim is to transform research knowledge into operational tools for urban planning and design practice that include the identification and development of typical descriptions, measurements, and indexes that can be useful in various planning situations or in the process of evaluating new proposals. The collaborative setup of the project between practice and research has led to intense discussions both within academia and within the planning organization of Gothenburg, where new ideas have emerged about handling its different data sets and how results from urban analysis can be integrated within the municipal planning administration and into participation processes. In this sense, the project has found a genuine interest in the kind of support that knowledge from research can offer when addressing issues related to social sustainability in urban design and planning.

The method applied for this purpose and presented in this paper is a three-pronged approach that combines 1) configurational analysis, 2) urban resource analysis, and 3) observations of co-presence. This three-pronged approach we argue improves the understanding of the potentials of public space. The paper demonstrates, firstly, how such a combined analysis brings a richer understanding to the interplay between spatial configuration and co-presence situations in public space that also can contribute to planning practice. Secondly, how such an approach can be summarised into diagrammatical representations useful in both professional practice and public communication. Finally, the study shows how these approaches can be introduced in current planning processes in Gothenburg with rather simple adjustments of databases and GIS-technology but we will also discuss the difficulties in implementing methods and approaches developed within research into practice. In a long-term and city-wide perspective, we believe that this kind of socio-spatial approach exemplifies how public planning more accurately can help to reach more equal living conditions with the aim to decrease social exclusion and segregation.

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1 The research project is part of Mistra Urban Future and is financed by the National Board of Housing and
2. The role of spatial configuration in social segregation

The massive post-war housing expansion in Sweden produced housing schemes clearly characterized by principles of enclosures, repetition and hierarchy; typical attributes found in many neighbourhoods designed according to neighbourhood unit planning principles and in areas being part of the Million Homes Program\(^2\). Such spatial form was believed to foster and encourage social solidarity and was largely based on community ideals and group-territory thinking (Hanson & Hillier, 1987). However, according to Hillier, such enclosures are not the answer to the urban problem, but to a large extent the problem itself and he argues that these urban environments provide unintelligible and largely under-used spaces (Hillier 1988, p. 64). It is found that the design of many housing estates prone to poverty and exclusion poses an obstacle to integration processes in itself (Vaughan, 2005). More specifically, the design has been found to have an impact on behaviour that is disadvantageous for social life and solidarity processes: there is a ruptured interface between locals and non-locals, and public space does not offer the potential for ‘bumping into people’, ‘dropping in’, or ‘popping round’ (Hansson, 2000; Hanson & Zako, 2007). Casual and informal social arrangements are not supported but need instead be replaced by pre-planned and formal arrangements. Further, the information field of public space is changed, implying that personal experiences of different parts of the city become limited (Hanson, 2000: 114–115). It has been argued that the configuration of urban space can create either closeness or distance between citizens and between resources in a city. Streets as well as local squares thus appear to have a key role for providing opportunities and access to urban resources that is crucial for people’s life chances. Young (1996) for example argues that the separateness between privileged and underprivileged groups per se is not the main problem for segregation, rather, that the living conditions are different and that the awareness of such differences is ignored. Public space is therefore seen to play a key role in the matter of segregation because it can be designed either to optimize processes that bring people together, supporting movement and co-presence as well as co-awareness, or to inhibit such processes (Legeby, 2013; Legeby & Marcus, 2011). Accordingly, public space is argued to provide a crucial arena facilitating certain social processes that may overcome social exclusion, however, to what extent it may perform in such direction is depending on its particular spatial form and its subsequent influence on the distribution of movement flows (Hiller et al., 1993; Hillier, 1996).

Much empirical space syntax research highlights the particular correlation between integration and movement, but movement may be seen as a mediator for co-presence, emphasising its importance for social processes rather than aiming at movement in itself (Marcus & Legeby, 2012). This aligns closely with the ideas originally set out in space syntax theory about the relation between spatial form and social processes (Hillier & Hanson, 1984). Within space syntax theory space is not seen as a neutral background for social and cultural processes, rather, space is assumed to have an inherent social logic (Hillier & Hanson, 1984). Beside theories about the social logic of space, our argumentation in this paper rely on theories by Giddens (1984) and Goffman (1963) emphasising the importance of co-presence. A potential for social interaction is created as a result of the routines of day-to-day life as individuals encounter each other in situated contexts. Giddens emphasises the importance of those different situations that may emerge as people share space (Giddens, 1984, p. 65-67). This is a reason to investigate the correspondence between urban form on the one hand and a potential co-presence situation on the other hand at different locations in a city. In The Culture of Cities, public spaces are seen as representations, producers and sites of negotiation, for society as well as for public culture (Zukin, 1995). The public culture that may develop in certain places, including certain views and norms, is according to Zukin affected by those who share public space and therefore she argues that ‘being in the city’ in fact means ‘being in society’. Arguably, it becomes relevant to question who has access to public space in different neighbourhoods? Where in the city do citizens with different backgrounds have a possibility to share space? The kind of information and knowledge that non-locals potentially may bring to a certain area is according to Granovetter (1973; 1983) different from ‘provincial news and view’ and is crucial for getting a job. An inflow of non-

\(^2\) The Million Homes Program was an initiative constructing one million housing units between 1965–1974 to meet housing shortage as a result from rapid urbanization.
locals is also important for local business, non-residential activities and services. Neighbourhoods that do not afford such inflow may be left in the shadow of information and knowledge that potentially can contribute overcoming social exclusion. Hence, to create urban spaces that give access for non-locals should make for greater diversity of groups in society to share space that opens for experiencing and recognising ‘the other’ that can trigger processes of solidarity (Franzén 2009). Such urban processes we argue can be fostered through various architectural design components, more specifically increased spatial integration, increased constitution, better match between global and local integration, a densification along strategic public paths with a potential to integrate neighbourhoods in terms of activities and entrances (Hanson 2000; Legeby 2013).

The approach used in this study is believed to clarify to what extent configurational properties are favourable or not and can accurately identifies gaps, interrupted interfaces or missing links in the urban fabric. The four neighbourhoods in focus in this study in Gothenburg have many morphological similarities; the layouts are designed as inward-oriented enclaves with very weak spatial (and social) relations to their surroundings. Nevertheless, there are fundamental differences that are important when discussing to what extent urban design interventions potentially can make a difference; the situation is rather complex since some suburbs suffer poorer spatial conditions than others.

Figure 1: Local squares in the studied neighbourhoods.
3. Analysing living conditions: model and database

The neighbourhoods in focus in this study are identified as especially disfavoured and highlighted in a National anti-segregation initiative; Norra Biskopsgården built 1956-1963, Bergsjön 1965-1972, Hjällbo 1967-1969, and Gården 1969-1972, the three latter were part of the Million Homes Program. The design of these areas is strongly influenced by a Swedish interpretation of the neighbourhood-unit planning ideal (Legeby, 2010) and are generally organized as spatially demarcated enclaves dominated by housing. The traffic system is strongly differentiated, i.e. walking and biking routes are largely separated from those travelled by cars. Urban streets that unite the function of both circulation and public space and include built frontages with direct access to buildings are typically absent (Marshall 2005, p. 6). In order to understand their particularity three reference areas are included in the study; Högsbotorp, Kyrkbyn and Björkekärr with morphological similarities but having a population with a stronger socio-economic position.

Necessary data has been collected and organised to enable comparative socio-spatial analysis. First, an axial line model of the city was constructed so that urban form is taken into consideration. Based on an existing axial map an expansion was made including the city and parts of neighbouring municipalities. Second, relevant data including urban amenities, was identified and organised in a data base (including geographical information), e.g. schools, libraries, playgrounds, bus/tram stops, health care and sport facilities as well as commercial services; e.g. grocery stores, restaurants, cafés. Fortunately, one department within the city agreed to assist in setting up the database which was organised according to their GIS-standard and data was provided at an address point level. However, data about residents and working population was not made available on a correspondingly detailed level (neither for this project, nor for the officials at the planning department). Instead, data was aggregated into squares of 100×100 metres and these units have been used in lieu of more detailed information, not as detailed as in earlier research (Marcus, 2010; Legeby, 2010; 2013), implying that analysis of shorter radii may become unreliable. Third, an observation study was made to get a detailed picture of the mix of people in public space. The square/centre was identified as an important place for gatherings with high potential for exchange between locals and non-locals. In all, nine squares were observed and city officials participated together with researchers in the observations. Fourth, as an elaborative exercise a number of urban design interventions were proposed for Bergsjön and follow-up analyses were made to increase the understanding of the consequences and to demonstrate how such changes may be represented in diagrams.

Software used for configurational and accessibility analyses is the Place Syntax Tool (Ståhle et al., 2005) together with MapInfo 11.0. Results of the spatial analysis are presented through polar diagrams, thematic maps, combined thematic maps as well as what we call a line analysis.

4. Results: What’s found ‘just around the corner’?

The results will be presented from four different perspectives: 1) accessibility to urban amenities, 2) configurational deficits, 3) accessibility to workplaces, and 4) the intensity and the constitution of co-presence in public space. These are aspects that we argue are important for defining what living conditions may be provided locally and that is of crucial importance for potentially overcoming social exclusion. Moreover, in the theoretical preliminaries we have emphasised the correspondence between configurational properties and movement patterns, favourable locations for services and non-residential activities as well as inflow of non-locals, and thus we argue that these specific aspects are influenced by urban form.

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2 A map made by the consulting firm SpaceScape (2013) was used as a starting point.
Figure 2. Minimum distance to urban amenities.
5. Accessibility to urban amenities

As the analysed neighbourhoods are compared it is established that addresses within these areas in general have decent distances to the most important daily services. Hence, a kind of minimal level of service is provided: at least one school and one grocery store are found in relative proximity. The
analysis includes minimum distance along walkable streets and paths both as metric distance (right side of the polar diagram) as well as the number of turns (left side) to a certain urban resource. In the minimum distance analysis these two measurements correspond rather well. However, the neighbourhoods show considerable differences in terms of accessibility to a diversified set of urban amenities, i.e. measuring how many restaurants, cultural institutions or sport facilities that are accessible within a certain distance. First, in general the neighbourhoods are found to provide rather poor conditions (Hjällbo being the exception), and second, there is larger discrepancy between metric distance and number of turns in the accessibility analysis compared with the minimum distance analysis. Highest accessibility to urban resources is found in Hjällbo, Kyrkbyn and Högsbotorp, the two latter are reference areas.

6. Configurational deficits: a ruptured interface

The spatial analysis reveals that two neighbourhoods are integrated city wide, Kyrkbyn and Högsbotorp (reference areas). Looking at the neighbourhood squares/centres it is found that most squares are integrated to a similar degree as their local context, thus, the location is not more favourable configuratively than their surroundings, only Hjällbo square prove to be more integrated than the neighbourhood that it acts as retail and service centre for.

Figure 4: Network integration at city scale (radius 50).
At the local level, six squares are found to be similarly integrated as their context while three are more integrated than their surroundings: Gårdsten centre, Hjällbo torg and Rymdtorget. Comparing the integration core at a local and a global level we see that three squares are located where these integration concentrations overlap: Axel Dahlströms torg, Hjällbo torg and Rymdtorget, while the integration cores do not overlap where the other squares are located.

An in-depth study was conducted in Bergsjön in order to better understand ruptured spatial interfaces and to what extent urban design interventions can better support social processes. The sequence of (street) segments was analysed that connects east and west of Bergsjön, a connection with high potential to become a main link, yet orientation and constitution was poor. Using a so called line analysis ‘gaps’ along this sequence of street segments are identified and a large variation from segment to segment in all four variables considered is revealed: variations in terrain (height), centrality (betweenness), constitution (entrances), and the mix between night and day populations. In a proposal, new connections and buildings in strategic locations were added to improve the continuity of the link and heal gaps with the intention to improve orientation and provide better potentials for social interaction.

The proposed modifications along the sequence were added to the model and the follow up analysis showed a much stronger public axis connecting the eastern and the western part of Bergsjön with increased potential to function as a main street/path. Spatial centrality and constitution increased, as did the potential for co-presence and social interaction.
7. Accessibility to workplaces

According to analysis of the conditions important for chances in the labour market based on fourteen variables reveal large differences between neighbourhoods. Variables are grouped according to social aspects, configurational properties as well as accessibility to workplaces and job-finding-institutions. Accessibility to workplaces is found to be highly important for chances in labour market (Åslund et al. 2010), important for exchanging information (Granovetter, 1973; 1983) and local workplaces also has an impact on the intensity of urban life (Legeby 2010). The conditions prove to be poorest in Bergsjön, exemplified by low accessibility to workplaces both locally and at longer distances, proportionally poor access to the city centre using public transportation, and high unemployment rates locally. It is of great concern that the poorest conditions are found where the residents are socio-economically most disfavoured. The situation in the three reference neighbourhoods is essentially more favourable in this respect.

The urban design interventions proposed for Bergsjön proved to have an effect on accessibility to workplaces: from Rymdtorget it increased with as much as 24% and from Gärdsås torg it increased with 17% while from Komettorget it only increased with 5% (within 3 km). Noteworthy, we must

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Figure 6. Line analysis: current situation and situation according to proposed interventions.

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^No new workplaces/inhabitants have been added in the model so it is describing a change in access to the existing ones.
conclude that, in comparison with the reference neighbourhoods, these improvements represent only moderate advances if comparing absolute numbers: Axel Dahlströms torg has more than three times as many workplaces within one kilometre than the western part of Bergsjön. Hence, in spite of improvements as a result of urban design interventions, the situation is still unfavourable.

Figure 7. Accessibility to amenities important for opportunities in the labour market.
8. Inflow of non-locals

Empirical data of co-presence is collected through observations\(^5\): intensity was established by counting co-present people at certain intervals and the constitution was established by asking for peoples’ residential addresses using a questionnaire. These two straightforward approaches gave a distinct image of the character of co-presence in public space. The assumption here is that depending on the mix of locals and non-locals different potentials are created in respect of what kind of social processes that are encouraged in the different spaces that potentially may overcome social exclusion.

The questionnaires tell us that the share living within a radius of thousand metres from each square range between 44-72%. The lowest share of locals is found at Hjällbo torg where 44% live within one kilometre, a square that have higher integration in relation to its context. A high share of locals is found at Komettorget, where 71% live within thousand metres of walking distance, a square segregated from its context. The 50-percentile distance to co-present peoples’ home addresses is less than thousand metres at eight out of nine squares. When the metrical distance is compared with number of (axial) turns, three squares distinguish that are all located in Bergsjön. The results show that in proximity of these three squares the axial lines are much shorter than around the other squares, meaning that they are configuratively deeper positioned in their context than other squares (decreasing their access).

\(^5\) Observations were made in April (ca 10°C), intensity counted as ‘snapshots’ 19-21 times/day.
Table 1. Co-presence study: interview and observation.

<table>
<thead>
<tr>
<th>Place/Square</th>
<th>Distance from the square to home address</th>
<th>Intensity</th>
<th>Share (%) living within</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50 percentile</td>
<td>75 percentile</td>
<td>median value</td>
</tr>
<tr>
<td></td>
<td>metres</td>
<td>turns</td>
<td>metres</td>
</tr>
<tr>
<td>Gårdsten C</td>
<td>770</td>
<td>5</td>
<td>7834</td>
</tr>
<tr>
<td>Hjällbo torg</td>
<td>1343</td>
<td>10</td>
<td>5805</td>
</tr>
<tr>
<td>Rymdتورget</td>
<td>953</td>
<td>11</td>
<td>2753</td>
</tr>
<tr>
<td>Kometتورget</td>
<td>345</td>
<td>5</td>
<td>2201</td>
</tr>
<tr>
<td>Gärdsås torg</td>
<td>516</td>
<td>7</td>
<td>1695</td>
</tr>
<tr>
<td>Friskväderstorget</td>
<td>531</td>
<td>5</td>
<td>1136</td>
</tr>
<tr>
<td>Axel Dahlströms torg</td>
<td>768</td>
<td>7</td>
<td>1584</td>
</tr>
<tr>
<td>Kyrkbytorget</td>
<td>676</td>
<td>5</td>
<td>1592</td>
</tr>
<tr>
<td>Stabbetorget</td>
<td>457</td>
<td>4</td>
<td>1181</td>
</tr>
</tbody>
</table>

Figure 9: Distance to home addresses of co-present people: metric distance and number of turns.

Observations of intensity show that there are not many people on the move in public space close to most of the squares, Hjällbo torg being the exception. However, this is a very large square so even if it achieved highest number of people the square still may be perceived as desolate and rather still characterised by co-absence. Knowing that the squares generally belong to the more populated spaces within these neighbourhoods, illustrating how extensive public space is used which effects urban life, exchange between people, but also the level of service that can be maintained.
A complementary analysis was made of the accessibility to residential and working population within one kilometre from each square/centre as density and land-uses are very unevenly distributed which is believed to have an impact on movement flows. Axel Dahlströms torg and Friskväderstorget are found to have the highest access to population in its immediate catchment area while Stabbetorget has less than half of that amount. The other areas are rather similar in this respect.

<table>
<thead>
<tr>
<th>Place/Square (R=reference area)</th>
<th>Integration of neighbourhood at city level, (R50)</th>
<th>Integration (RS0): context vs. neighbourhood</th>
<th>Local integration of place/Square</th>
<th>Integratio n interface</th>
<th>Access to people &lt;1000 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gårdsten C</td>
<td>Low Integrated as context</td>
<td>High integration. Stronger than context</td>
<td>Strong mismatch</td>
<td>8 884</td>
<td></td>
</tr>
<tr>
<td>Hjällbo torg</td>
<td>Medium More integrated than context</td>
<td>High integration. Stronger than context</td>
<td>Mismatch</td>
<td>8 437</td>
<td></td>
</tr>
<tr>
<td>Rymdtorget</td>
<td>Medium More integrated than context</td>
<td>High integration. Stronger than context</td>
<td>Match</td>
<td>9 848</td>
<td></td>
</tr>
<tr>
<td>Komettorget</td>
<td>Low Segregated from context</td>
<td>Medium integration Similar to context</td>
<td>-</td>
<td>7 717</td>
<td></td>
</tr>
<tr>
<td>Gårdsås torg</td>
<td>Medium Integrated as context</td>
<td>High integration. Similar to context</td>
<td>Match</td>
<td>8 693</td>
<td></td>
</tr>
<tr>
<td>Friskväderstorget</td>
<td>Medium Integrated as context</td>
<td>High integration. Similar to context</td>
<td>Strong mismatch</td>
<td>12 833</td>
<td></td>
</tr>
<tr>
<td>A Dahlströms torg (R)</td>
<td>High Integrated as context</td>
<td>High integration. Stronger than context</td>
<td>Match</td>
<td>13 766</td>
<td></td>
</tr>
<tr>
<td>Kyrkbytorget (R)</td>
<td>High Integrated as context</td>
<td>High integration. Similar to context</td>
<td>Strong mismatch</td>
<td>8 054</td>
<td></td>
</tr>
<tr>
<td>Stabbetorget (R)</td>
<td>Low Segregated from context</td>
<td>Medium integration Similar to context</td>
<td>Match</td>
<td>5 993</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Configurative properties and accessibility to people.

In order to understand who contributes to the local everyday life at the squares, the visitors’ home addresses are marked on a map (red dots in Figure 10). We find large variations in the patterns, indicating rather different catchment areas for the squares. The river Göta älv seems to constitute a barrier in at least three cases: Gårdsten, Axel Dahlströms torg, and Kyrkbytorget; few of the visitors report that they live on the opposite side of the river. Noteworthy, the social catchment areas of the three squares in Bergsjön prove to be different: not only has Rymdtorget a larger share of non-locals, it’s visitors also live more spread out in the city compared to the social catchment area of the other two squares. This may be explained both by the configurative properties and by the fact that it is appointed to serve Bergsjön as a whole and therefore, public and commercial services have been directed here. Such attractors also have an impact on inflow of non-locals (Legeby 2013). Taken together, urban life at Komettorget and Gårdsås torg has a more local character than Rymdtorget, meaning that the potential for getting in contact with citizens from other parts of Gothenburg is higher at Rymdtorget. The three reference neighbourhoods prove to have rather limited catchment areas as well which however was expected as these too are designed according to urban design principles favouring the local community on behalf of an openness to ‘strangers’. 
9. Discussion and conclusions

The results of this study are many-faceted and concern a variety of issues; however, below we discuss firstly the difficulties related to implementation of socio-spatial analysis in planning practice, and secondly, the conclusions from an architectural perspective based on what the analyses have identified as the main challenges for improving the living conditions in the studied neighbourhoods.
To build a database involves many different actors, an organizational challenge that in spite of a collaborative attitude proved rather complicated. There were difficulties in collecting data and a lack of relevant data, e.g. building heights, floor area, and apartment sizes at property level. We met a weak understanding about aggregation of data and had difficulties in making data available for key persons due to security concerns. We conclude that statistics/data generally is not organized in a way that facilitates either their direct use in detailed spatial analyses or, more specifically, their use in a spatial model (e.g. integrated with GIS and the axial map model). Not only municipal administrations need to collaborate to a greater extent, also neighbouring municipalities need to be involved, given that administrative boundaries do not match functional regions. For more comprehensive mapping of Gothenburg (following this pilot), it is highly recommended that data of higher resolution is used, preferable on a property level that can be distributed to address point level (see e.g. Legeby 2013). It needs to be emphasized that the process of building a model and a relevant database is time consuming and calls for high precision, but as this is done the start-up costs for new projects decrease tremendously.

Throughout the process an urgent need has been identified for more accessible, informative, and operative geometric representations in order to better support the planning process. Also, methods and tools need to be more available outside research; for example, representations of the results need to be more communicative and readable for a wider category of users. This project has both suggested new procedures and forms of data management and proposed new and hopefully more informative and communicative maps/representations, i.e. geometric representations in the form of maps that can help better identify problems and support an informed political and not least the public debate on what to do, and finally drawings that actually capture the operative dimension of politically determined interventions. To ease implementation in practice we identify a need for particular educations to develop a deeper understanding of the applicability as well as the limitations of the methods.

From an architectural perspective, we identify public space as a key variable for facilitating important social processes in cities that in the long run can support social inclusion. We conclude that it is especially important to investigate the configurational properties of urban space due to its proven ability to distribute movement and in extension to create a variety of situations of co-presence, which, according to extensive sociological theory, is critical in the development and sustainment of social inclusion and cohesion, and, is critical in achieving more equal living conditions in the city. We understand the Gothenburg study to contribute to earlier research here concerning the relation between spatial configuration and the intensity of co-presence. More originally, it continues earlier research in Stockholm also concerning the relation between spatial configuration and what has been called the constitution of co-presence, the mix of locals and non-locals. The study contributes to a better understanding of how spatial configuration distributes urban amenities and resources by creating varying degrees of accessibility to these. The location of amenities is of course important but this study has demonstrated that accessibility also depends on the spatial configuration, the distribution of space. More specifically, we conclude that what is missing in many of these neighbourhoods is a dense network, or web, of high-centrality spaces that have the ability to distribute amenities through space in an efficient way and to connect each neighbourhood to its surrounding areas and to the city as a whole.

To sum up, the study has proved that it is possible to establish unequal living conditions in a way that is argued to be highly informative for urban design and architecture. It is found that the neighbourhoods provide decent access to basic key service but fail in providing access to a diversity of services. These identified inequalities are highly problematic, especially when people having fewer resources are affected. A conclusion is that urban form plays a critical role for what living conditions are created locally and a neighbourhood that do not encourage or support an exchange with the surrounding city, where non-locals are inhibited by urban form to enter and use the streets, fail in providing an arena that foster and support social processes that potentially can overcome social exclusion, and foster so called secondary benefits (Koch et al. 2012). This is an urgent challenge for urban design practice to respond to, and the socio-spatial approach presented in this study we argue illustrate a way forward for a more efficient and accurate urban design practice, however, with certain adjustment and developments needed to ease implementation in the official planning process.
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