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The dialogic city:

Towards a synthesis of physical and conceptual artefacts in urban community configurations

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Abstract

This paper addresses a question in urban research relating to definitions of the physical and conceptual artefacts that comprise local urban communities. These artefacts are, we suggest, products of complex relationships between discursive and non-discursive agencies in urban contexts.

We focus on the problems of defining conceptual artefacts by considering how urban communities' social meanings are embedded in their spatial configurations, conceptualizations and practices. Considering the relational nature of the built environment, we describe the interplays of space, society and meaning as being 'dialogic'. By this we mean that the urban environment's discursive and non-discursive agencies inform and transform each other through processes of their complex inter-dependencies. These dialogic processes also occur where professional and community practitioners seek to transform the built environment by exchanging their conceptualizations and definitions.

Towards a refocusing upon conceptual artefacts in the built environment, we review a selection of diverse research from the fields of space syntax, actor-network theory in architecture, and urban sociologies of crime and deprivation. We sample from specific studies of urban spatial effects upon local community behaviours. We observe that processes of conceptualization are revealed in professionals' definitions of urban environments. Moreover, we draw attention to the lack of community-membership definitions in many urban interventions. We argue that this lack persists because community conceptualizations, based upon 'mental models', tend to be reflected in quotidian or sub-conscious practices, which do not enter the standard professional discourse.

We reflect critically on the urban research studies sampled, considering in particular their treatment of the role of conceptualizations in shaping the urban environment. Building on this critique, we argue that the notion of 'mental models' is overlooked in the urban research literature and warrants further investigation. Working towards a synthesis of physical and conceptual artefacts, we attempt an outline of the significance of inter-dependencies in urban formations. Hence we consider the role played by local conceptualizations in phenomena such as neighbourhood boundaries, community foci, stereotypes of others and place-specific community values. Finally, we outline the requirements for a method to examine these conceptualizations.

Keywords

Urban configurations, conceptual artefacts, mental models, dialogue, urban research methodology.

1. Urban community configurations

Urban practitioners have acknowledged that society cannot be reduced to space (cf. Gans, 2002; 2006). Urban communities involve subtle and irresolvable interplays of social meanings and spatial structures, forming their physical and symbolic boundaries (Logan, 2012). Community spaces also include effects from within the broader urban network (Sampson et al, 2002; Hillier and Vaughan, 2007), positioned in one space with multiple layers of spatial, social and effective properties (Grannis, 2009). In this way, urban community spaces have social meanings embedded in their configurations, conceptualizations and practices. Understanding this 'super-positionality' (*ibid*., p.17-18) of urban community configurations, such as those found in neighbourhoods, warrants a methodology that draws upon distinctive and complementary perspectives.

This paper reviews a selection of relevant analyses of interplays between space and society. The authors sample from work in space syntax, which accounts for configurational properties of space in relation to empirical data of human activity. We also consider actor-network theory in architecture, which is based upon the complex human and material interactions that comprise urban developments in a state of flux. Finally, we select two distinctive strands of sociologies of urban deprivations: one based on statistical analyses across geographic units, and another on qualitative surveys of communities.

Considering these diverse studies together, they tell variously of what we call the *dialogic city*: an urban environment formed of inter-dependent spatial configurations, conceptualized realities and situated practices. Moreover, these components possess the capabilities to inform and transform each other. For this reason, we have argued that the notion of agency in the built environment helps us to study the relational complexities of community spatial configurations, such as those of the neighbourhood. Future work will seek to encapsulate the combinations that underpin community spatial formations.

In the following sections, we offer a brief introduction to current work in this field. We offer an overview of disciplinary perspectives upon the key theoretical themes relating to this work. Subsequently we provide a selective review relating to urban configurations, conceptualizations and practices. A discussion of this review attempts a methodological synthesis of physical and conceptual artefacts.

Current work

The theoretical perspectives outlined in this paper relate to a current socio-spatial analysis research project, "Visualizing Community Inequalities"[1]. The project aims to develop a new method for mapping urban communities in areas of high multiple deprivations, also including community-specific definitions of local spaces. The initial phase involves a study of local community spaces in Liverpool, UK (see Figures 1 & 2), which feature pockets of extreme poverty and multiple deprivations but also community vitality (cf. Sykes et al, 2013). For example, the neighbourhoods of the inner suburb of Toxteth are divided structurally along several main roads and its street networks are separated by arrays of bollards[2]. Given these internal separations within the city and its community spaces, we endeavour to understand how local spatial and mental models affect their communities in accessing resources, producing social meanings, and forming local identities. Hence a review of material and immaterial factors in the definitions of communities is essential for this purpose.

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[1] Bartlett School of Architecture & Computer Science, UCL. PI: Dr Andy Hudson-Smith (BSA); co-Is: Dr Sophia
[2] Installed in two waves: 1969/1973 to prevent kerb crawlers, and after the 1981 riots to 'settle' local areas. We are very grateful to Ronnie Hughes for providing this background information:
https://asenseofplaceblog.wordpress.com/2015/04/26/now-with-added-bollards [accessed 28th April 2015]
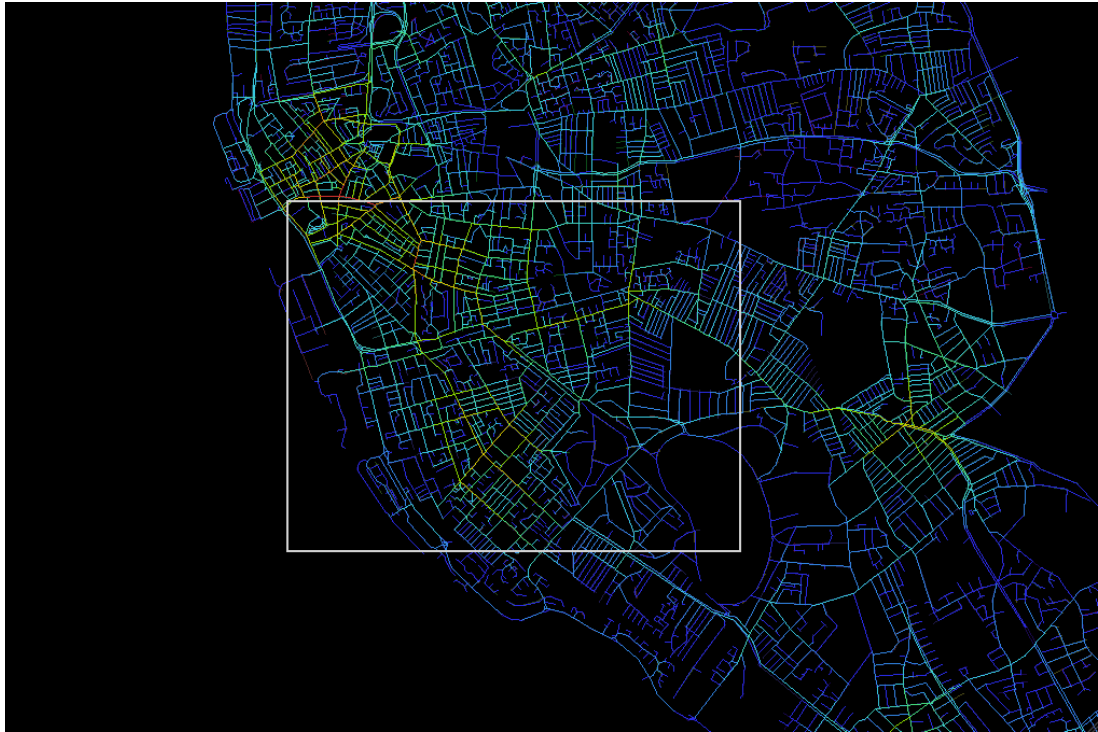
Figure 1: The current research project 'Visualizing Community Inequalities' studies community spaces in Merseyside, UK. Here an axial map (R=800) of central Liverpool reveals local centralities at the urban centre and inner southern suburbs (outlined).
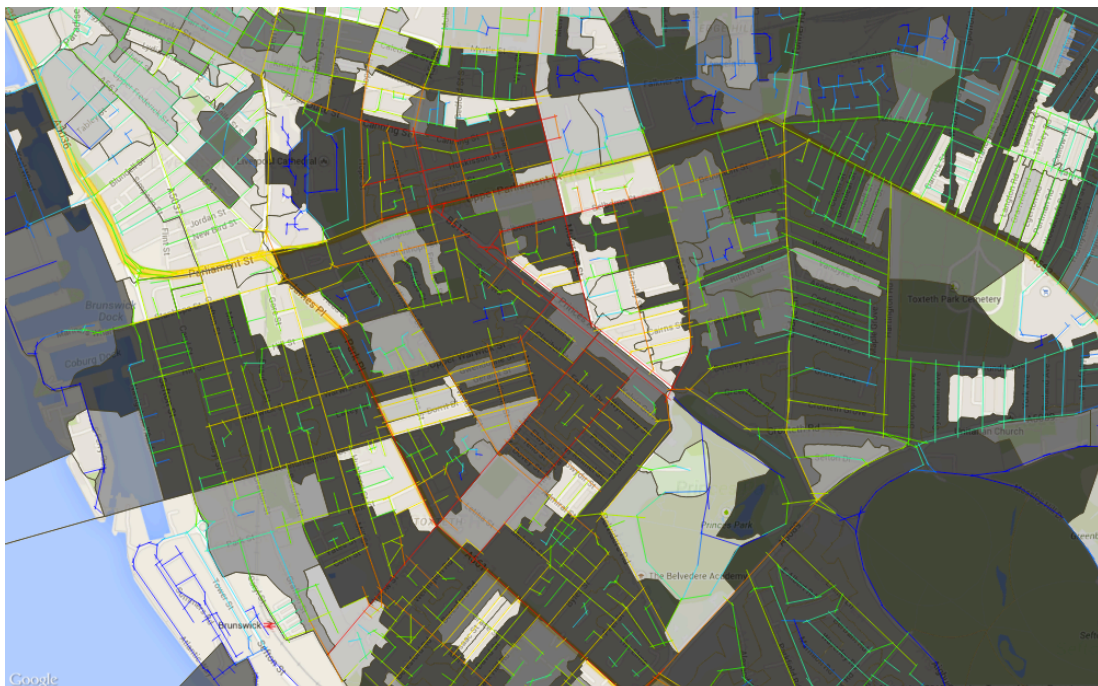

Figure 2 The study samples the Liverpool's southern inner suburb of Toxteth. A segment map (R=1000) reveals distinctive patterns of connectivity in relation to the urban centre, associated with specific local features and identities, such as pockets of low car ownership shown here in light greys.

2. Introduction: perspectives on community spaces

Agencies and effects

Community spaces are special features of the urban environment, formed through the socio-spatial configurations by which people achieve 'nearness' at many levels of the home, street and public space. Community spaces comprise relational complexes of object and abstract artefacts (Hillier, 2007, p.67-68), which we term physical and conceptual artefacts respectively. By extension to this argument, people and places have agency: their quasi-autonomous abilities to shape their environments. Spatial agencies are any components of the urban community space which actively change the relationships, forms of flows of that environment.

Interventions in the community space, whether designed, planned or quotidian, involve networks of citizen and professional practitioners, who (together or apart) influence the trajectories of their urban projects. These practice-based agencies are discursive, in the sense that they are based upon verbal communications, and they may be talked about directly. For example, in the context of architecture, Adrian Forty has outlined the relationships between the architect's professional vocabulary and the production of meanings of space for design practice (Forty, 2004). In contrast to this view, Hillier defines space and social relations as being fundamentally non-discursive (cf. Hillier, 2007).

Non-discursive agencies are not verbal and are not talked about directly; they form conceptual intermediaries of community life. Such agencies may not be recognized consciously by professional and citizen practitioners, and necessitate analytical methods to reveal their significance and meanings within the urban environment (Hillier, 2007; Psarra, 2009; cf. Rappaport, 1990). For example, certain network configurations can underpin everyday pathways and routes, yet the configurations' basic structures are subsumed within the urban environment. So, too, geographic, political or even administrative features (such as postcodes) may tacitly demarcate significant community spaces.

One such non-discursive agency may relate to 'neighbourhood effect' – being a causal property of the local environment with a predictable impact upon community behaviours. Research that seeks to determine these effects has been criticized for reductively defining 'neighbourhoods' based upon administrative units (cf. Lupton, 2003). Yet, in spite of these criticisms, there appear to be correlations between concentrations of poverty and frequent disorders and disadvantages in local urban community areas (Sampson et al, 2012). The specific dynamics of these kinds of effects in socio-spatial contexts warrant further investigation.

Similarly, in the area of social network research it has been suggested that community spaces may produce predictable positive outcomes. For example, social factors that mitigate disorders affecting children and adolescents[3] seem (perhaps counter-intuitively) to be based upon *weak* social ties within and across culturally homophilous communities (Grannis, 2009, p.25-26). Such weak ties mean that adults may know each other indirectly through their children, as well as through interactions at local community facilities, such as schools or health centres. Weak ties mean that adults are more likely to intervene in each other's children's behaviours in the street, and also to reproduce positive behavioural and social norms (*ibid*.). Hence, we can, for example, observe that a neighbourhood 'effect' is embedded within the hierarchical interactions of the complex community network. The research we sample into neighbourhood and social effects has incorporated socio-spatial complexity in their analyses.

Space syntax and relational complexity

Space syntax as a theory and method accounts for spatial configurations in relation to patterns of socio-economic activity and cultural meaning (Hillier and Hanson, 1984; Hillier 2007). Its methods

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[3] Including issues such as drug and alcohol abuse, poor mental or physical health or teenage pregnancy.

allow researchers to test conjectures about urban spatial movements, relationships and meanings based upon 'non-intuitive' actions such as reasoning, induction and analysis (Karimi, 2012). Here we focus on a selection of theories from space syntax literature that lie at the heart of our synthesis: the notion of relational complexes, the structures of network centralities, and of foreground and background networks, and the possibility of non-discursive methods.

Hillier has described how the built environment comprises 'relational complexes' that constitute its buildings and cities (Hillier, 2007, p.74), built out of object and abstract artefacts (*ibid*., p.67-68). As object artefacts, such as streets and buildings, are subject to natural and physical laws, so abstract artefacts include the realizations of 'socially meaningful configurational entities' that are subject to spatial functions or significant rules (*ibid*., p74). Here we may suggest an example of a neighbourhood boundary, which may be shaped around a set of streets (object artefact), where the rules for what is inside and outside that boundary are based on the local population's sub-conscious or tacit delimitation of its community space (abstract artefact).

Space syntax has not to date considered how abstract artefacts also relate to conceptualizations of space by community members. Hence we introduce a novel term, 'conceptual artefacts' to encapsulate the spatial products of non-discursive agencies or sub-conscious exercises in urban use patterns. These may be revealed in sets of tacit assumptions and meanings that are subsumed in quotidian activities, influenced by community members' 'mental models' of that space. Analysis of mental models that underpin the formations of these artefacts would require an empirical method, which interconnects urban configurations with spatially and socially embedded meanings. A possible method may be drawn from actor-network theory, which we introduce briefly in the following section.

Actor networks of urban practices and materialities

The sociological field of actor-network theory has considered the so-called mutual constitution of practices and materialities. These include human and non-human actors in the process: the activities that people do, and what they do these activities with. For example, Farías and Bender (2010) have described how cities include 'non-human ecologies', which generate urban spaces through the mass interactions of their machine components. Elsewhere, urban geographers influenced by actor-network approaches have described the 'symbiosphere' of cities, comprising the inextricable networks of people and tools to produce the urban ecosystem (Amin and Thrift, 2002). Some ANT theorists have argued that much urban research has 'hidden' cities behind disciplinary concepts such as structure, system and scale (cf. Smith, 2010).

The 'actor network' of spatial analysis is represented in multi-layered GIS integrations. These show manifold inter-relationships of populations, their neighbourhoods, the trajectories of their movements, the conditions of their socio-economic behaviours and cultural and political experiences. Yet, like all tools of visualization and mapping, they also impose artificial conceptualizations upon practitioners' thinking about the urban landscape. For example, the notion of convex space in an urban area discretizes an open space into units, while in empirical and conceptual terms these areas are perceived differently, so that no matter how divisible into constituent parts, they retain an identity as 'wholes'. Therefore an outstanding challenge in the analysis of conceptual artefacts is to distinguish community concepts from professional concepts.

Urban practitioners must, as a consequence, reflect on how their professional tools affect their analysis and descriptions of space. Reflexivity in practice may be achieved by examining how professional tools become agents in shaping the urban landscape. Professional tools may be physical or conceptual but, either way, they have 'obdurate' properties: they impose, for example, technological standards or the preconceptions of mental models onto urban developments (Hommels, 2010). In the following section, we build upon this observation to consider how the built environment as a whole is formed through agencies and intermediaries, including concepts, definitions and dialogues. Throughout, we relate these themes to the formation of community spaces.

We noted above how we are focusing our current research on areas that present deprivations and poverty. This is because differences in conceptualization and definition appear to be particularly wide between community and professional practitioners. In the following sections, we review a selection of recent work in urban research relevant to this theme.

3. Urban configurations: non-discursive agencies and intermediaries

We noted in the sections above that distinctive spatial patterns form in urban contexts due to network effects, socio-economic distributions and cultural identifications. However, these approaches have contextualized communities in urban spaces, but have not accounted for their 'configurations' of these urban spaces. Urban configuration – a paradigm that underpins space syntax – is reflected in social uses of space as part of a relational, conceptual and physical complex (cf. Hillier, 2007). Configurations are captured through topological measurements of the urban network such as choice ('betweeness centrality') and integration ('closeness centrality'), (Hillier and Iida, 2005; Hillier et al, 2010). Centralities in this way relate to distributions of land uses that influence accessibility to infrastructural networks, services and social resources. As such they have an effective socio-spatial function in urban community contexts.

However, network centralities may be settings for impoverishment and deprivation, especially in areas that are socially or economically homogenized. Vaughan and Geddes (2009) analyzed the famous Booth maps of urban poverty in the 1890s to demonstrate how local integrations of impoverished neighbourhoods relate to the broader urban landscape. The spatial analytic graph shows street segments based on the intersections of axial lines, relating also to the angle of incidence of the street junction. Their analysis of London's Soho and Whitechapel neighbourhoods suggests a pattern of economically dominant streets that affected movement in the neighbourhood, resulting in low connectivity and centrality. This brought about a pattern of segregated streets within the spatial interstices, which contrasted markedly with their immediate, more affluent surroundings.

This kind of pattern, featuring pockets of urban deprivation, may reflect a paradox of opportunity in impoverished areas. Centralities may be crucial for recent migrants into slums for securing opportunities. Yet these centralities may also contribute to homogenous 'minority clustering', often based on complex economic, social and family connections within neighbourhood contexts (Vaughan and Arabaci, 2011). Hence spatial effects are interdependent with social and cultural factors.

Beyond the space syntax literature, significant relationships between spatial networks and other urban-context factors have been demonstrated using geo-computation, which have shed new light on the effect of distance, access and exposure in socio-spatial configurations. For example, as proximity to employment opportunities demonstrably affects employability, so travel-distances to work have a decay function, whereby less weight is given to employment in relation to distance required to travel (cf. Logan, 2012).

Significant work in geo-statistical analysis of urban networks has been undertaken by Rick Grannis (1998, 2005, 2009). Grannis focused his research upon tertiary street layouts, being sets of streets where houses face each other, have no through-traffic between them, and are bounded by through-traffic streets. Tertiary (or pedestrian) streets support so-called *T-communities* based on frequent social interactions without the impediments of through traffic and busy roads. T-communities also tend to form chains between through-traffic streets, and Grannis has shown how homophilous racial distributions in several large American cities are based upon these street-network chains. Significantly, Grannis has shown that greater racial disparity exists *between* large T-communities than *among* them (2005), thus revealing how community networks based upon race form chains for as long as possible within the pedestrian street network. For this reason, Grannis (1998) has also highlighted the importance of 'trivial' streets that inter-connect blocks of tertiary streets, thus providing a path for novel community links to form.

In the field of urban sociology, Anne Power has described the significance of the urban environment for social exclusion. Examining spatially diverse communities within the patchwork of urban spatial inequalities (so-called 'jigsaw cities'), Power has described how cycles of socio-economic, material

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and community decline have brought about an urban pattern of discrete zones of deprivation and impoverishment (cf. Power and Houghton, 2005). The economically challenging circumstances of these zones may engender socio-cultural segregation and inter-community conflicts within their neighbourhoods (*ibid*., p.195). Centralized bureaucracies may also disempower community citizens from managing their own dwellings and neighbourhoods, which perpetuates the material neglect of these places. Yet among and alongside spaces of deprivation, Power has identified spaces of community connectivity and urban innovation, which are not always visible to the outside observer (*ibid*., p.158-159).

Power's findings have been based upon a longitudinal study involving interviews with 200 families living in disadvantaged neighbourhoods. Power recorded in detail the experience of the so-called 'city survivors' who depend fundamentally upon their family and community urban networks (Power, 2007, p.45-46). Power found how the interactions of family members within their neighbourhood's 'inner layer' 'recreate the social vitality' of cities (*ibid*., p.177). In these centralized contexts, Power has also shown how certain deprivations have stemmed from conflicts of interest among community members and urban professionals. We discuss this observation below as it relates to the theme of conceptualization.

Weisburd et al (2012) have presented their extensive findings of crime patterns in Seattle, based on multivariate analyses of crime and social disorder patters within geographic micro-units. The authors recognized that most crime in the city has occurred within a highly limited number of street segments, or 'hot spots', distributed across the city. These 'hot spots' are surrounded by crime-free areas, producing a pattern of 'bad streets' in 'good areas' (*ibid*., p.186-187). Many hot spots are associated with a range of social and physical disorders, or have high mixed land-use, such as those areas situated between industrial and commercial complexes (*ibid*., p.127-128).

Their findings showed how crime hot spots were associated with socio-economic indicators such as high levels of welfare benefits, school truancy, physical disorder (such as illegal dumping and substandard housing) and racial heterogeneity (which has been associated with weak community engagement). Furthermore, hot spots are associated with 'attractors' for crime, including low guardianship (*ibid*., p.110-112), unsupervised teenagers and low voter registrations, which indicate weak social controls and low intervention in social disorders (*ibid*., p.137-143). The authors also highlight the high significance of street network types in the incidence of crime. For example, many of the city's crimes occur around infrastructural assets, such as bus stops, situated on arterial roads, which inter-connect the far higher proportion of residential streets (*ibid*., p.105-110).

Considered together, the studies outlined in this section describe non-discursive agencies in the urban configurations. These relate to street networks and intersections, distance functions, homophilous aggregations, and attractors for disorders such as adjacent zones within economically disparate areas. However, while each study has outlined structural or socio-cultural factors in community formations, none has considered what we term 'conceptual artefacts'. Hence, in the following section, we draw on another sample of work in urban research that attends variously to the processes of conceptualization in urban contexts

4. Urban conceptualizations: conflicts in definitions

The configurations of community spaces may relate to socio-cultural identities such as ethnicity, religion, labour divisions or social class (Marcuse, 2002, p.11-34). Considering the separations of urban communities, the geographer David Sibley (1995) has pointed to spatially defined distinctions in the urban landscape. These, he maintains, are revealed in stereotypes of 'others' and the separate places in which 'they' live. Sibley has argued that stereotypes may provide community members with a means of coping with the instabilities of urban landscapes (*ibid.*, 1995, p.15). Sibley's notion of stereotypes is, we argue, one example of community members' conceptualizations of others and their significance for their local community identifications. In this way, people's descriptors of otherness in the urban environment, such as areas that are 'poor', 'rough' or 'transient' and so on, play a part in separating sets of people into discrete community areas. Albeit these separations might be based upon preconceptions or even prejudices.

Community spaces that are conceptualized and defined as neighbourhoods afford the benefits of family life, social experiences and economic opportunities (Kearns and Parkinson, 2001). Yet neighbourhood identities are not spatially or temporally fixed. Community members' concepts of their neighbourhood vary according to, for example, their age, gender, level of ability, socio-economic standing or stage in life (Lupton, 2003). Furthermore, neighbourhoods may also bring negative consequences for its community members, as in the example of young people from a particular area becoming drawn to crime; albeit the causal relationships between neighbourhood urban spaces and susceptibilities to social disorders are not well understood (Ellen and Turner, 1997).

Neighbourhoods also change their characters in different places and times. For example, the main streets and public spaces of informal settlements, ('slums', 'favelas'), have economic and social attractors forming community focal points, yet these become highly unsafe in specific periods of the week and times of day due to traffic and conflicts among drug gangs (cf. Perlman, 2010, p.38-39).

Neighbourhoods may also be disrupted by differences in definition among community members and professionals. For example, Power and Houghton (2005) have described how policy-based interventions have served to rehouse community members in ostensibly 'better areas', leaving them with the disadvantage of separation from social cores such as family homes (*ibid*., p.55). So, too, major infrastructural projects have undermined or replaced 'community anchors', such as places for stopping and chatting or for children's play (Power, 2007, p.58-59). Furthermore, neighbourhood relationships can be undermined by rapid social changes, not least where long-standing communities encounter 'incomers' without opportunities for inter-cultural brokering (*ibid*., p.151-152).

Considering the significance of conceptualizations in urban community formations, we may consider some methodological limitations in the notion of 'neighbourhood effects', which have focused exclusively on socio-spatial patterns (cf. Sampson et al, 2002). Lupton (2003) has argued that analysis in this regard results from a persistent separation among relevant research fields, which tend to be orientated to either individual-level surveys, or to area-level modelling of possible correlations. In order to overcome these limitations, research into neighbourhoods must accurately reflect their 'complex conceptualization', focusing on the many ways in which people and places interact, as well as the inter-relations of particular neighbourhoods within the wider urban landscape (ibid., p. 4).

Such complex conceptualizations of local community spaces have been revealed in Lynsey Hanley's authored description of growing up on a large, peripheral council estate. There she experienced a persistent phenomenon of the so-called 'wall in the head' (Hanley, 2008, p.148-149). This coinage refers to a mental barrier to access and opportunity, based upon conceptually internalized experiences of growing up within a spatially separated urban enclave. Moreover this separateness includes a place-specific set of values and norms, security and self-worth (cf. McKenzie, 2015, p.206-207). We observe how salient aspects of the urban community space become internalized in the individual community member, transformed into values, norms and behaviours.

Conceptualizations of community spaces are formed out of actors' place-specific practices, identities and values. As such they strongly influence spatial and social behaviours. Hence a model layer of community members' definitions of their localities would help urban practitioners to understand the interplay of local topo-geometries, such as centralities, with the conditions of community life, relating to 'anchors' or 'cores'. We note that none of the studies we sampled have reflected directly upon the processes of conceptualization and definition within areas. We argue that there is a need for greater reflexivity in professional urban practice, specifically in relation to modes of discourse in conceptualization. We develop this theme in the following section.

5. Urban practices: dialogue and reflexivity

The intermediaries of community spaces, their topo-geometric and topographic properties, provide the means by which urban actors both *think of* and *think with* their environments (Hillier, 2007, p.27-30). For example, space syntax has shown how cities are arranged topo-geometrically into foregrounds of economic movement and backgrounds of controlled, residential zones. In these

contexts the observer sees the 'other' city (whether background or foreground) relative to his or her situation (Hillier and Vaughan, 2007). We *think of* these networks in terms of theoretical and professional discourse; we *think with* them in terms of quotidian actions based upon spatially embedded meanings.

We maintain a position here that *thinking of* and *thinking with* urban spaces each requires dialogue-based interactions between actors and their environments. *Thinking of* involves contrasting definitions of urban spaces, which are exchanged discursively among actors, and which compel iterative refinements and calibrations in practitioners' designs and models. *Thinking with* urban spaces are communicated non-discursively through sub-conscious exercises, yet compels dialogic exchanges of spatially embedded meanings among actors.

This dual (discursive/non-discursive) nature of 'dialogue' is reflected in principle in the work of Jack Mezirow (2000), a sociologist of education. Mezirow observed how dialogue among adult learners deals with contingencies in 'consensus-building' towards an embedded *community of practice*. Here community building necessitates freedom from coercion and distortion, so as to contextualize and weigh arguments objectively, and to regard diverse disciplinary perspectives on their own terms. Mezirow has shown how learning as an adult may achieve transformation through challenging and reconstructing the given or dominant frame of reference. Hence dialogue is a means to 'try on' the other's perspective (*ibid*., p.21), to experiment using imagination and to reflect critically upon the assumptions one brings to the learning environment.

Another 'dialogic' approach to urban developments may be drawn from the notion of *urban controversies* (cf. Yaneva, 2012), which result from conflicts in description and meaning among professional and citizen practitioners. Controversies can lead to misapprehended definitions of urban phenomena, or their misapplied meanings that (as we have seen) can lead to negative effects within urban developments (Power, 2007, p.45-46). Attending to the need for reflexivity in practice, actor-network sociologists Yaneva and Latour have demonstrated a method for mapping professional interactions, which dynamically shape an architectural project (Latour and Yaneva, 2008, p.87). Their approach views urban forms as generative constituencies of material and practice-based configurations. For example, the architect's drawing of a proposed development steers the thinking and discussion of clients and design professionals. Their dialogues in turn affect the architect's iterations.

Yaneva has extended a social method in urban analysis, arguing that a goal of architectural theory is to achieve an 'understanding of the building as a plethora of material and subjective considerations (2012, p.80). Yaneva argues against a set of architectural theories that uphold a 'regime of causation' (*ibid*., p.33). These supposedly seek to explain those historical and cultural meanings that are reflected in, yet lie outside of, urban forms. We noted from the outset that practitioners avoid the reduction of society to space. Yaneva justifiably argues that space (architecture) cannot be reduced to sets of meanings, symbols and myths. Instead she argues for a pragmatic and non-reductive approach to the emergence of spatial forms from actor-network interactions. As such, Yaneva argues against any regard for descriptive correspondences of social meanings and spatial forms.

Yaneva criticizes architectural theorists who have borrowed from notions of 'social reality' in the social sciences (*ibid*., p42). Yet Yaneva samples from a body of urban theoretical literature with parallel selectivity; focusing exclusively upon 'oppositional' architectural theories that relate space to, 'society/architecture, nature/culture, reality/rationality' (*ibid*., p.39). Here Yaneva has omitted any reference to space syntax as a theory of urban configuration, which has focused upon the elaboration of spaces into 'socially workable patterns [...] through which cultural or aesthetic identities are expressed' (Hillier, 2007, p.16). We argue that Yaneva (2012) has dealt only with how actors *think of* urban configurations in terms of applying theory discursively to physical artefacts. Her model has excluded how they *think with* these configurations, including their applying mental models non-discursively to conceptual artefacts.

6. Discussion: towards a synthesis

In this paper we have attempted to set out the terms for a synthesis of physical and conceptual artefacts in urban community formations. We outlined some ways in which research in space syntax, actor-network theory in architecture and urban sociologies of deprivation have defined spatial and social inter-dependencies, addressing these to matters of urban configurations, conceptualizations and practices. We noted how community formations relate to physical artefacts such as pedestrian street patterns. We also outlined an actor-network theory of urban developments, which describes the social construction of the built environment, yet (in this specific example) the approach overlooks the contribution of space syntax theory in describing the embeddedness of social meanings in spatial forms.

Our sampled review has reflected upon the inter-relationships of spatial and social networks in urban communities, and how these depend upon specific conditions and externalities. We observed that spatial centralities and social cores may not locally converge (cf. Hillier, 1999; Power and Houghton, 2005). However where spatial centralities do converge with social cores, as in the example of socially effective 'weak ties' in T-communities (Grannis, 2009, p.26-26), the interplay of social and spatial relationships appears to be dependent on other factors within the environment, such as cultural or racial homophily. Moreover urban community relationships may have paradoxical effects, such as providing opportunities for in-comers, and limiting their scope for mobility beyond their local areas (Vaughan and Arbaci, 2009).

We noted how homogeneity and separateness in the urban environment can enforce stereotypes of 'self' and 'other' (Sibley, 1995), which is perhaps a factor in the stabilization of mental models. These models may be reflected in socio-spatial structures and behaviours, including neighbourhood boundaries and place-bound identities or values (McKenzie, 2015). We maintain that community-relational dependencies also include 'conceptual artefacts', revealed in tacit definitions and sub-conscious exercises, which stem from actors' mental models. However, the nature of the relationship between a community's conceptual artefacts and a community member's set of mental models is far from clear.

We argue that the question of this relationship relates directly to the notion of a 'dialogic' synthesis of relational artefacts. An outstanding challenge for further research in this field is to integrate configurational urban models by systematically capturing non-discursive conceptual artefacts from urban-community contexts. We anticipate that this systematic capture may be achieved by extending socio-spatial analysis of an urban community to incorporate the semantic network of its inter-relationships.

7. Conclusion

Urban communities produce conceptual artefacts based on their members' mental models, which stem from internalizations of localized norms and values. Professional practitioners apply concepts to the urban community setting, revealed in theoretical discourses that, in general contrast to community-membership concepts, tend to be portable to other contexts. The community-membership concepts may not be revealed by the standard professional analysis and this is, we argue, to the detriment of community developments. The next phase of our research will enhance space syntax analysis with a qualitative survey and systematic processing of non-discursive community-membership concepts. This research will help to advance our understanding of how mental models shape relational complexities, serving to synthesize physical and conceptual artefacts into urban community forms.

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