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Polycentricity



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Polycentricity refers to spatial structures on various scales that feature a number of spatially separated centres related to one another through mutual exchange processes. The term is used both in an empirical/analytical sense and in a political/normative sense, but a uniform understanding has yet to emerge.

1 Definition

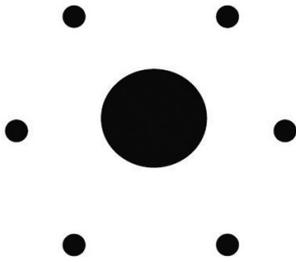
In recent years, polycentricity has established itself as a specialist scientific term, but without a uniform understanding of the term having emerged in the \triangleright *Spatial sciences* (cf. Davoudi 2003; Hall/Pain 2006; Green 2007; Danielzyk/Münter/Wiechmann 2015). Neither is there a consensus as to how polycentricity is to be empirically understood (cf. Kloosterman/Lambregts 2001; Kloosterman/Musterd 2001). This is compounded by the fact that polycentricity is addressed on different scales and that the concept can be understood in an empirical/analytical sense and/or in a political/normative sense. Both contexts have expanded the bandwidth of the term and created considerable uncertainty surrounding the concept of polycentricity.

What is undisputed is that polycentricity as a descriptive term refers to a spatial configuration of objects and the relationship between those objects. Polycentric spatial structures are characterised by the distribution of residents, companies, workplaces, infrastructure facilities, structural artefacts or – more abstractly – productive and reproductive functions across several centres that are spatially separated but among which there are mutual, exchange-based functional relationships. Centres in this context are understood to be both larger cities and towns with their respective spatial/administrative boundaries as well as less clearly definable spatial agglomerations with specific functions. The latter are often referred to as subcentres.

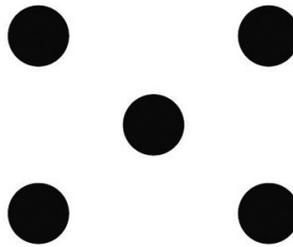
2 Morphological and functional polycentricity

A distinction is commonly made between the morphological and the functional dimension of polycentricity (cf. Meijers/Burger 2010; Green 2007). Morphological polycentricity is based solely on the distribution of structures or functions in \triangleright *Space*. In this regard, relevant characteristics of a settlement system include the number, size and \triangleright *Density* of centres and the characteristics of their spatial location. When it comes to functional polycentricity (or even relational polycentricity), on the other hand, the focus is on the exchange processes between individual centres (see Fig. 1). Functional polycentricity only exists when adjacent centres exhibit a minimum level of connectivity (cf. Meijers/Burger 2010). Examples of this include economic structures that are organised spatially based on specialised functions, as well as internal and external company networks, the flow of purchasing power and the movement of commuters.

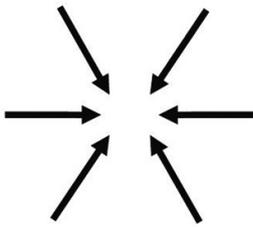
Figure 1: Morphological versus functional polycentricity



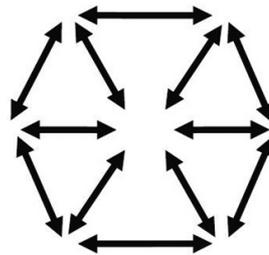
Morphologically Monocentric



Morphologically Polycentric



Functionally Monocentric



Functionally Polycentric

Source: Burger/Meijers 2012: 1134

3 The question of scale

Spatial structures are identified as polycentric on very different scales. They range from urban centre systems to interregional forms of polycentricity at the national and transnational level. A distinction has been established between inter- and intra-urban polycentricity (cf. Kloosterman/Musterd 2001). Inter-urban refers to regions (\triangleright *Region*) made up of cities that are adjacent but administratively independent and which have often developed historically. With the regionalisation of economic activities and lifestyles as well as decreasing spatial barriers, these regions have developed into large-scale interconnected economic and living environments. The Ruhr area in Germany and the Randstad in the Netherlands are well-known examples. Intra-urban polycentricity, on the other hand, denotes a pattern of centres on a tighter urban or urban-regional scale. With the \triangleright *Suburbanisation* of the population and of jobs, suburban centres have emerged around all of the larger core cities; they exist partially in competitive and partially in complementary relationships with the established higher-order centres. Intra-urban polycentricity can thus now be found in all urban regions (\triangleright *Urban region*), even in traditionally monocentric urban regions like Munich and Paris. Finally, on an even higher scale, interregional

forms of polycentricity are also being addressed, including recent debates on a further leap in the dimensions of ▷ *Urbanisation*, as manifested in the formation of ‘mega-urban’ regions (cf. Ross 2009; Florida/Gulden/Mellander 2008).

4 The origin of polycentric spatial structures

Common explanations for the emergence of polycentric spatial structures point to external economies of scale due to the spatial concentration of population and economic activity, which, in combination with negative externalities in the densely populated core cities, allow for the emergence of new centres in suburban areas. Due to the fact that the benefits of agglomeration spread beyond the core cities, suburban centres benefit from spatial proximity to them without being affected by the typical disadvantages of agglomeration such as high property prices, land shortages or traffic congestions in comparable degrees (▷ *Agglomeration, agglomeration area*). Polycentric spatial structures are thus created by simultaneous deconcentration and centralisation (cf. Meijers/Burger 2010).

They can also be the result of ▷ *Spatial planning*. Examples of this include the ▷ *Planning* of metropolitan centres to relieve development pressure elsewhere (such as the Frankfurt-Niederrad and Paris La Défense office agglomerations), which in many European metropolises since the 1960s (▷ *Metropolis/Global City*) has led to peripheral centres for services as well as to regional development strategies like that of decentralised concentration (▷ *Settlement/settlement structure; ▷ Concepts of spatial planning (Raumordnung)*). In addition, the fragmentation of the political power below the level of the nation state is also seen as providing favourable circumstances for the formation of (inter-urban) polycentric spatial structures. In the wake of changed perceptions of the state’s role and changing administrative principles, large – frequently polycentrically organised – regions have become more politically important. This can be seen in the various forms of municipalisation and regionalisation of government roles as well as in competitively-oriented regional development policies and new governance arrangements (▷ *Governance*).

5 The effect of polycentric spatial structures

In addition to describing and analysing the development of spatial structures, research has also long focused on the different effects of spatio-structural configurations. For example, economics research is examining the specific properties of monocentric and polycentric spatial structures with respect to the emergence of agglomeration effects that promote growth. One question is whether agglomeration-related economies of scale develop to the same or an even greater extent than in monocentric settlement systems (cf. Cowell 2010; Meijers/Burger 2010). Another important question is whether the regional centres co-exist in a complementary way whereby each focuses on certain bundles of goods/service provision, or rather in competition with one another. In this context, reference is made to the advantages arising from the spatial proximity of companies at functionally specialised locations, a more extensive range of high-quality ▷ *Services* owing to size, a ▷ *Transport infrastructure* less prone to congestion as well as a differentiated labour and housing market (▷ *Labour market; ▷ Housing market*). The argument that polycentric regions wherein each

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centre focuses on certain types of goods/service provision enjoy competitive economic advantages is, however, controversial as there is still no empirical proof of 'regionalised' agglomeration advantages due to polycentric spatial structures (cf. Meijers/Burger 2010).

The degree to which the transition from monocentric to polycentric spatial structures has resulted in changes in the volume and spatial structure of commuter traffic has been a topic of discussion in transportation studies since the 1990s. Individual studies have shown polycentric regions to have lower commuting costs.

With a view to the ▷ *Provision of public services* by the government and local authorities, the relative efficiency advantages of ▷ *Infrastructure* locally bundled in centres (▷ *Central place*; cf. Blotevogel 2002) is repeatedly emphasised. In addition to social infrastructures (▷ *Social infrastructure*), technical utility services (▷ *Utility services*) are provided in a more cost-effective way in larger, more densely populated settlement units (cf. Siedentop/Schiller/Gutsche et al. 2006). However, on the whole, the empirical findings in this regard are not sufficient to speak of clear evidence of any environmental and/or economic efficiency advantage associated with polycentric spatial structures (cf. Watts 2009; Siedentop 2007).

6 Polycentricity as a normative planning strategy

Despite its ambiguity, polycentricity has established itself in ▷ *Spatial development* as a normative concept. Corresponding concepts can build on the planning principles of decentralised concentration recognised since the 1960s and sometimes detach themselves from the existing morphological spatial structures and functional interdependencies by declaring polycentric spatial structures to be the objective. The most prominent example is probably the European Spatial Development Perspective (ESDP) adopted in 1999, which defines polycentricity both as a strategy to promote balanced territorial development within the European Union (EU; ▷ *European Union*) and as a suitable means to mitigate regional disparities (▷ *Disparities, spatial*) using locally-organised growth poles (cf. Davoudi 2003). The differing focus on certain types of goods/service provision resulting in various centres complementing rather than competing with each other and the spatial structures associated with this are expected to enhance competitiveness. The Territorial Agenda of the EU from 2007 and 2011 also affirmed this idea.

On the national scale, the discussion surrounding the concept of European metropolitan regions (▷ *Metropolitan region*) in Germany was led by the idea of a polycentric network of large-scale cooperation between cities and surrounding regions (▷ *Relations between cities and surrounding regions*). In the context of the sustainability debate (▷ *Sustainability*), there are also concepts in ▷ *Urban planning* that propagate the idea of polycentricity, in particular in the concept of the compact city, in which a polycentric centre structure in the urban fabric reduces the spatial distances between housing, work, local services, leisure and educational facilities and should thus indirectly reduce traffic volume, landscape fragmentation and urban sprawl.

However, since there has only been limited success in empirically proving the claimed efficiency advantages of polycentric spatial structures, the politico-normative and empirical/analytical dimensions of the debate surrounding polycentricity in spatial development have yet to be convincingly integrated.

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