

Scale and anti-scale

John Paul Jones III

University of Arizona, USA

The measurement of scale is central to understanding how maps represent the Earth's surface and in popular usage is still the most common meaning attached to the term. Beginning in the 1980s, however, the term "scale," especially as it was used by human geographers, was dramatically broadened from its traditional definition as a measure of cartographic transformation. During this period, scale became one of the pillars of social theoretic reflection in geography, and for many geographers it became perhaps the central contribution of the spatial perspective to the social sciences more generally. The arguments were simple and appealing. If, as was being widely acknowledged at the time, the operations of social processes are to a great extent dependent upon the larger sociocultural, historical, and geographical contexts in which they are found, then might not these processes function differently, or even be sorted according to, various scalar contexts, such as the local, regional, national, and global levels? If yes, then geographers could argue that scale is foundational to social explanation more generally. What is more, if scalar contexts are the result of social processes, rather than being simply given as set categories of analysis, then social and spatial explanation would need to go hand-in-hand. This pairing offers compelling reasons why "geography matters," or should matter, to the broader social sciences. Not only were many human geographers attracted to theories of scale in geography,

so too were many theoretically-inclined social scientists outside the discipline.

Scale theory arose in the wake of, and is sometimes viewed as a component of, the sociospatial dialectic, an influential theory that maintains that social processes simultaneously produce and are produced by space, including all aspects of geography, from the forms and organization of our natural and built environments, the material, symbolic, and ideological aspects of place, and the everyday geographies forged through human lived experience. Scale is one concept within such dialectical thinking. Yet, at the same time that scale was being developed as part of spatial dialectics, the critical wing of the discipline was undergoing other shifts; in particular, away from what was perceived to be a strict materialist, economistic, and structural Marxism towards a more avowedly poststructuralist (née postmodern) body of theory. The ideas geographers brought to the concept of scale were affected by these transitions. Whereas initially theorists viewed scale as the product of capitalist social relations, later, under the sway of poststructuralism's less centralized and more discursively-inflected forms of power, the boundaries and operations of scale became more uncertain. Indeed, under poststructuralism's "crisis of representation," questions arose as to whether scale is, in fact, an ontological bedrock of social space or merely an epistemological framework that we impute to space to help provide order and meaning. The local-to-global scaffolding upon which scale was initially theorized was challenged by such nonhierarchical theories as found in Gilles Deleuze's and Félix Guattari's philosophy and Bruno Latour's actor-network theory. These issues are at the

center of a series of works that have made scalar and anti-scalar theories a much debated area in the 2000s.

Scale as cartographic measure

In its traditional, cartographic meaning, scale is defined as the ratio of the distance on a map relative to that same distance on the Earth's surface. By convention, the first number in the ratio is the map's unit (=1) distance, whereas the second number is the corresponding (i.e., same metric) distance on the Earth's surface. So, for example, a map ratio of 1:100 000 indicates that every, say, inch of map distance shows 100 000 inches of surface distance, or roughly 1.6 miles (100 000 inches/5280 feet/12 inches = 1.578 miles). This is a common ratio used by the United States Geological Survey for topographic mapping at an intermediate scale.

Map scales are distinguished as large or small based on the size of the ratio of the two numbers. A common USGS map at 1:24 000 is said to be relatively large scale, owing to the size of the resulting number, relative to a map with a scale of 1:250 000, which has a much lower value and is, therefore, referred to as smaller in scale. A point of common confusion is that since larger scale maps reduce the Earth's surface to a lesser extent, they therefore show less surface area, while small scale maps are needed to show large areas. A 1:24 000 map enables viewers to identify urban or rural features such as streams, roadways, and land use patterns, while maps at smaller ratios, such as the commonly used 1:100 000 or 1:250 000 maps, are used to discern the shapes of river basins and state political boundaries. The zoom function in digital mapping has made these fixed scales much less relevant. Seasoned map enthusiasts can tell you what scale a USGS map is by simply glancing at it, but we now commonly

select our scales in a continuous fashion based on our needs by simply scrolling a mouse.

Theorizing scale

It was Peter Taylor who first offered a social theory of scale. In his 1982 article he makes two arguments. First, he maintains that political economy should be the theoretical basis for the subdiscipline of political geography. Second, he argues that scale should be the grounds for spatializing this body of theory. (Taken together, it is not surprising that, after Taylor, theories of scale have seen most of their influence in political and economic geography.) Inter alia, Taylor critiques several treatments of scale then extant in political geography, finding them to be drawn from commonsense understandings instead of rigorous theorizing. His avowedly materialist theory of scale derives from Immanuel Wallerstein's world-systems approach, which Taylor affirms but identifies as deficient in its implicit horizontal approach to space (i.e., as areal extension rather than in terms of spatial levels). In its place, he proposes a "political economy of scale" with three vertically conceived levels: "the scale of reality (global), the scale of ideology (state) and the scale of experience (urban)" (Taylor 1982, 24). Here reality refers to the facts of capitalist accumulation at the global scale, while ideology implies a view of the state as an institutional apparatus "whose purpose is to simply separate experience [the urban scale] from reality" (Taylor 1982, 24). Crucially for Taylor, the global political economy is foundational, yet every scale is relational:

Hence we do not propose three processes operating at three scales but simply a single manifestation of capitalist accumulation within which the arrangement of three scales is functionally important. For instance, the needs of accumulation will be experienced

locally (e.g. closure of a hospital) and justified nationally (e.g. to promote national solvency) for the ultimate benefits organized globally (e.g. by multi-national corporations paying less tax). (Taylor 1982, 24)

The second important contribution to scale comes from Neil Smith in his 1984 book, *Uneven Development*. Throughout, Smith delivers an impressive presentation and unpacking of a wide range of concepts related to the “dialectic of [spatial] differentiation and equalization” (Smith 1984, 135) under capitalism. By the time we get to his chapter on scale and the “see-saw” of capital (Smith 1984, 131–154), we know that scales do not simply exist as given levels, but are at the heart of uneven development under capitalism: “Capital inherits a geographical world that is already differentiated into complex spatial patterns. As the landscape falls under the sway of capital (and becomes increasingly functional for it ...), these patterns are grouped into an increasingly systematic hierarchy of spatial scales” (Smith 1984, 135). One of Smith’s advances over Taylor’s, it could be argued, lies in his departure from what he calls Wallerstein’s “perspective of exchange space” (Smith 1984, 176, footnote 7). For Smith, scale is produced by capital, while capital itself becomes bound to that spatial configuration:

I think it is possible to use the dialectic of differentiation and equalization to derive the actual spatial scales produced by capital, and to show that the result of uneven development is simultaneously more complex and [simpler] than a mosaic. There is little doubt about the impossibility of a spatial fix for the internal contradictions of capital, but in the doomed attempt to realize this spatial fix, capital achieves a degree of spatial fixity organized into identifiably separate scales of social activity. (Smith 1984, 135)

Smith agrees with Taylor that scales exist at the urban, nation-state, and global levels, but he

is reluctant to assign to these levels a specific and allied social process (e.g., ideology to the nation-state, experience to the urban). Rather, as he shows in subsections devoted to each level, capitalism produces scales as part-and-parcel of its endless shifting between equilibrium and disequilibrium. It does so through the “spatial fixes” – that is, centralization, expansion, and jumping into new spaces altogether – that are inherent in solving capitalism’s fundamental contradictions. But

however fixed these scales are made, they are subject to change, and it is through the continual determination and internal differentiation of spatial scale that the uneven development of capitalism is organized. The vital point here is not simply to take these spatial scales as given, no matter how self-evident they appear, but to understand the origins, determination and inner coherence and differentiation of each scale as already contained within the structure of capital. (Smith 1984, 136)

In the two decades following these two important works, the discipline saw many extensions and refinements to the concept of scale. These took several interrelated lines of analysis. The first was a focus on the “politics of scale” – a result of the recognition that, while capital might attempt to produce space in its own image, scales could also be strategized and fought over. Among those who made important contributions in this area was John Agnew, who demonstrated that Italian political parties organize around spatial categories of the local, regional, and national so as to “define the geographical scales that channel and limit their political horizons” (Agnew 1997, 118). Similarly, Byron Miller showed how social movements, such as peace activists in Massachusetts, deploy different scalar strategies as political opportunities suggest themselves (Miller 1994). More generally, as Erik Swyngedouw puts it:

Geographical configurations as a set of interacting and nested scales (the “gestalt of scale”) become produced as temporary stand-offs in a perpetual transformative, and on occasion transgressive, social-spatial power struggle. These struggles change the importance and role of certain geographical scales, reassert the importance of others, and sometimes create entirely new significant scales, but – most importantly – these scale redefinitions alter and express changes in the geometry of social power by strengthening power and control by some while disempowering others. (Swyngedouw 1997, 169)

Swyngedouw’s distributed notion of power is consistent with a second line of analysis that developed in the scale literature, namely the loosening of strict scalar boundaries (e.g., urban, nation state, global) and the broader integration of vertical scalar productions with horizontally conceived social networks. Neil Smith, for example, continued his elaboration of malleable scales, coining the terms “scale jumping” to describe how political power established at one scale can be expanded to another, and “scale bending,” the process by which “entrenched assumptions about what kinds of social activities fit properly at which scales are being systematically challenged and upset” (Smith 2004, 193). Less rigid forms of scalar thinking also emerged as geographers came to see that scales and networks together might provide a more potent descriptive and explanatory framework. For example, Kevin Cox (1998) proposed that scales are contingent on the “networks of association” upon which different capitals and local states depend. As networks become more global in reach, they begin to stretch across scales. The necessity of relaxing otherwise rigid understandings of scale was, for Neil Brenner, a result of globalization, which he defined in terms of scale: “a reconfiguration and re-territorialization of superimposed spatial scales, and not as a mono-directional implosion

of global forces into sub-global realms” (Brenner 1997, 159). He explicitly links scales and networks, offering that:

Scales evolve relationally within tangled hierarchies and dispersed interscalar networks. The meaning, function, history and dynamics of any one geographical scale can only be grasped relationally, in terms of upwards, downwards and sideways links to other geographical scales situated within tangled scalar hierarchies and dispersed interscalar networks. ... Each geographical scale is constituted through its historically evolving positionality within a larger relations grid of vertically “stretched” and horizontally “dispersed” sociospatial processes, relations and interdependencies. (Brenner 2001, 605–606, emphasis in original)

Helga Leitner is another theorist of scale who responds to globalization – particularly of the political variety – by integrating vertical scales with horizontal networks. She writes:

transnational networks represent new modes of coordination and governance, a new politics of horizontal relations that also has a distinct spatiality. Whereas the spatiality of a politics of scale is associated with vertical relations among nested territorially defined political entities, by contrast, networks span space rather than covering it, transgressing the boundaries that separate and define these political entities. (Leitner 2004, 237)

A third development in the scale literature comes from glances downward – downward even from the urban scale – to the scale of the home, the street, and the body. In what remains the most cited paper on scale, Sallie Marston (2000) deploys the concept of social reproduction to illustrate how most scale theory has been: “largely unresponsive to questions of difference in human agents and how power relations outside the relations of capital and labor might also influence scale-making” (Marston 2000, 238). In response, she situates the home as the scale at which the

everyday relations of patriarchy, racism, and citizenship connect to wider scales. Marston demonstrates her argument through a description of the expanding consciousness and political roles of US women in the nineteenth and early twentieth centuries:

greater political empowerment proceeded from the reconstitution and reclamation of the social geography of daily life. A discourse about women as “female citizens” operated among and between scales from the household out to the globe and provided these subjects with a consciousness that enabled a particular negotiation of patriarchal subordination and began a gender transformation of the public sphere through a reconstitution of the private sphere of the home. In short, the home was utilized as a scale of social and political identity formation that eventually enabled American middle-class urban women to extend their influence beyond the home to other scales of social life. (Marston 2000, 235)

In what might be said to be geography’s first skirmish over scale, Neil Brenner reacted to Marston’s expansive theorization. His aim in responding was to:

contribute to the development of an approach to sociospatial theory in which the specifically scalar dimensions of social spatiality – in contradistinction to its many other dimensions, such as localization, place-making, territorialization, spatial distancing, the formation of spatial networks, the production of environment/nature and so forth – may be adequately recognized and theorized. (Brenner 2001, 593)

In arguing for “a more precise and hence analytically narrower conception of geographical scale” (Brenner 2001, 593), Brenner’s reply – which includes eleven methodological hypotheses – was only strategically directed at Marston, for, as elaborated above, since its initial tracing by Taylor and Smith, the concept of scale

has been progressively widened through a series of theoretical interventions. These have made the concept of scale both more processually inclusive (e.g., through a focus on the politics of scale and the inclusion of social reproduction and environmental processes in scale theory) and, relatedly, more spatially complex (e.g., by including horizontal networks and households). In offering that scale should be tied to “an explicit causal argument linking the substantive social content of the spatial unit in question to its *embeddedness* or *positionality* within a broader scalar hierarchy” (Brenner 2001, 600, emphasis in original), Brenner sought to limit scale to “relations of hierarchization and rehierarchization among vertically differentiated spatial units”, such that they can be distinguished “from other forms of sociospatial structuration” (Brenner 2001, 603).

Marston’s reply to Brenner, co-authored with Smith (Marston and Smith 2001), concedes the importance of more analytic precision around scale, but concludes that Brenner will not find the tools for it by maintaining boundaries between scalar production and the wider social production of space (à la Lefebvre):

scale is a produced societal metric that differentiates space; it is not space per se. Yet “geographical scale” is not simply a “hierarchically ordered system” placed over pre-existing space, however much that hierarchical ordering may itself be fluid. Rather the production of scale is integral to the production of space, all the way down. Scaled social processes pupate specific productions of space while the production of space generates distinct structures of geographical scale. The process is highly fluid and dynamic, its social authorship broad-based, and the scale of the household (or the home) is integral to this process. So too, we contend, is the scale of the body. (Marston and Smith 2001, 615–616)

In addition to their theoretical response – which is centrally pointed to the question of what kind

SCALE AND ANTI-SCALE

of space scale is – Marston and Smith also criticize Brenner for an “inability to see the theoretical relevance of the social reproduction argument” (Marston and Smith 2001, 617); they maintain that it is “arbitrary that the home is relegated to a ‘place’ or ‘arena,’ while the state gets to be a multifaceted ‘scale’” (Marston and Smith 2001, 618). “Future historical research may yet reveal the household to be a ‘stable background structure’ in all of this,” they reply, “but the smart money will be wagered elsewhere” (Marston and Smith 2001, 618).

Anti-scale theorizing

As suggested above, scale might not merit a simplistic oppositional trope – “anti-scale” – for it has long proved to be a multifaceted, evolving, and contested concept, even among its proponents. Nonetheless, it is clear that some time near the end of the century geographers began to reflect more critically on the analytics of scale – as witnessed in the debate between Brenner and Marston and Smith – but also, and more fundamentally, on the very question of whether scale adds value to the geographic lexicon. For example, in addition to her questioning of the primacy of capital, labor, and the state in the social construction of scale, Marston’s seminal intervention presaged her and others’ later work under the anti-scale label when she openly entertained the “the rejection of scale as an ontologically given category” (Marston 2000, 220). This point echoes an earlier but less widely-known essay by Katherine Jones (1998, 28), who may have been the first to sharpen the ontological and epistemological distinctions of scale when she wrote: “[W]e may be best served by approaching scale not as an ontological structure which ‘exists’, but as an epistemological one – a way of knowing or apprehending.” Writing in response

Table 1 Spatial associations of the horizontal and vertical.

Horizontal geographies	Vertical geographies
Network	Scaffold
Extensive	Layered
Horizon	Summit
Distance	Elevation
Milieu	Dominion
Dispersed	Stacked

Source: From Marston, Jones, and Woodward (2005, 420).

to Kevin Cox (1998), who, like Brenner (2001), was concerned to distinguish between scales and areas, such as localities, Jones suggested that the politics of scale may be little more than a special case of the politics of representation:

If scale is a representational practice deployed by participants in struggles, a practice situated within a community of producers and readers who actively negotiate and construct it, then what is its ontological status? Does scale exist beyond that community as a fundamental structure of the world, or is it a mode for apprehending the world that is tied to a particular historical/geographical context? Furthermore, does it make any difference whether we see scale as a fundamental ontological category, or as an epistemology, and if it does make a difference, then what is that difference? I would argue that scale is an epistemological category, rather than an ontological one, and that the difference is an important one. (Jones 1998, 27)

The most extensive critique of scale to date came in a 2005 article by Sallie Marston, John Paul Jones III, and Keith Woodward (2005). Unlike Brenner (2001), Marston and her colleagues saw no possibility of achieving analytic specificity in the concept, which they claimed was ontologically and, hence, causally deficient. They illustrated their point by claiming that the primary difference between the horizontal

geographies of networks and the vertical geographies of scales is the reflexive position (i.e., epistemology) of researchers' spatial imaginaries (Table 1), and not scale's ontological – and therefore casually grounded – foundation. The resulting confusion leads, they argue, to conceptual gymnastics that are increasingly detached from the concrete social spaces of everyday practice: “[O]ne encounters ... ‘structures’ not at some level once removed, ‘up there’ in a vertical imaginary, but on the ground, in practice, the result of marking territories horizontally through boundaries and enclosures, documents and rules, enforcing agents and their authoritative resources” (Marston, Jones, and Woodward 2005, 420). Scale theorizing, they continue, has so infiltrated – and been affected by – discourses of globalization that “over the past twenty years, political and economic geographers have tended toward macro pronouncements that assigned the global more causal force, assumed it to be more orderly ... and, by implication, relegated [the local] to the status of the case study” (Marston, Jones, and Woodward 2005, 421). Such “globe talk” cordons off, if not eviscerates, agency and resistance relative to detached, but somehow powerful forces such as “global capitalism,” “national social formations,” and the like. These conceptual apparatuses diminish the epistemological, methodological, and political insights of feminists and other theorists of the everyday (Gibson-Graham 2002). Critically for them, these problems will not be solved by replacing one transcendent account of spatiality (scale) with another (networks):

Network-based horizontality does avoid some of the problems [of scale], but in reviewing this literature we see significant evidence of ‘flowsterism’: the idea that people, phenomena and processes somehow fly above the stickiness of space in an atmosphere of frictionless fluidity. We find, moreover, the same tendency to spatial abstraction in the horizontal view that we also

criticize in the vertical one, with scattering lines of flows now standing as transcendental counterparts to layers of nested territories. (Jones, Woodward, and Marston 2007, 265)

In their 2005 and later articles, these anti-scale critics draw on various conceptual resources, including Deleuze and Guattari, Latour, Spinoza, and philosopher Theodore Schatzki, to construct a spatial ontology that replaces both scalar and network theorizing with a “flat,” or “site,” ontology, which they propose to consist of:

immanent (self-organizing) event-spaces dynamically composed of bodies, doings and sayings. Sites are differentiated and differentiating, unfolding singularities that are not only dynamic, but also “hang together” through the congealments and blockages of force relations. The “actuality” of any site is always poised for compositional variation – subject to reorganizations and disorganizations—as its inexhaustible “virtuality” or potential continually rearticulates itself. (Jones, Woodward, and Marston 2007, 265)

Site ontology thus stands as an alternative to the structural imperatives of scalar spatiality, avoiding the latter's transcendent logics, predetermined spatial frames, and axiomatic strategies that, Marston and her colleagues maintain, identify research problems such that they can be “solved for scale” (Marston, Jones, and Woodward 2005, 426).

Conclusion

In 2006 and 2007 the journal *Transactions of the Institute of British Geographers* published a handful of replies – some spiritedly critical, others sympathetic – to “Human Geography without Scale” (Marston, Jones, and Woodward 2005), and the authors penned a lengthy rejoinder (Jones, Woodward, and Marston 2007).

The exchange has become known as the discipline's "scale debates." Since then, a number of other commentators have offered additional perspectives, leaving the current thinking on scale falling into two camps: (i) those who have reaffirmed scale's ontological status (sometimes in combination with network theories), and as part of this view, continue to champion it as a foundational component of social space (Jessop, Brenner, and Jones 2008; Leitner, Sheppard, and Sziarto 2008); and (ii) those in geography and elsewhere who have criticized not only structuralist approaches to social relations, but also the attendant and conformant structuralisms of hierarchical spatiality, and who are thus supportive of developing ontological alternatives to scalar thought (Escobar 2007; Isin 2007).

Regardless of their position with respect to scale's ontological status, both groups are generally united in their agreement on a third position, namely, that the scalar imaginary – that is, scale as epistemology – plays a significant role in social determination (Moore 2008; Kaiser and Nikiforova 2008). Perhaps here it bears emphasizing that no scale critic ever discounted the fact that people's geographic imaginaries are often socially constructed in scalar terms. This is especially so in the Western tradition, where spatial order remains a powerful legacy of Cartesian thought. Likewise, no scale critic ever dismissed the fact that scale talk – that is, scale deployed as a discourse – is political, and thus regularly fought over by social actors. In this sense, anti-scale theorists continue the project of elaborating the "politics of scale," even while they resolve to replace the concept with others more consistent with a poststructuralist ontology, such as the assemblage or the site. And so it might be said that the singularly important and as yet unanswered question about scale is a larger, disciplinary one: What is this thing we call "space," and what

added value does scale provide in our efforts to define it?

SEE ALSO: Critical geography; Globalization; Glocalization; Marxist geography; Ontology: theoretical perspectives; Scale; Social constructionism; Uneven regional development

References

- Agnew, John. 1997. "The Dramaturgy of Horizons: Geographical Scale in the 'reconstruction of Italy' by the New Italian Political Parties, 1992–95." *Political Geography*, 16: 99–122. DOI:10.1016/S0962-6298(96)00046-7.
- Brenner, Neil. 1997. "Global, Fragmented, Hierarchical: Henri Lefebvre's Geographies of Globalization." *Public Culture*, 24: 135–167. DOI:10.1215/08992363-10-1-135.
- Brenner, Neil. 2001. "The Limits to Scale? Methodological Reflections on Scalar Structuration." *Progress in Human Geography*, 25: 591–614. DOI:10.1191/030913201682688959.
- Cox, Kevin. 1998. "Spaces of Dependence, Spaces of Engagement, and the Politics of Scale, Or: Looking for Local Politics." *Political Geography*, 17: 1–24. DOI:10.1016/S0962-6298(97)00048-6.
- Escobar, Arturo. 2007. "The 'Ontological Turn' in Social Theory: A Commentary on 'Human Geography without Scale' by Sallie Marston, John Paul Jones II and Keith Woodward." *Transactions of the Institute of British Geographers*, 32: 106–111. DOI:10.1111/j.1475-5661.2007.00243.x.
- Gibson-Graham, J.K. 2002. "Beyond the Local vs. Global: Economic Politics outside the Binary Frame." In *Geographies of Power: Placing Scale*, edited by Andrew Herod and Melissa Wright, 25–60. Oxford: Blackwell.
- Isin, Engin F. 2007. "City State: Critique of Scalar Thought." *Citizenship Studies*, 11: 211–228. DOI:10.1080/13621020701262644.
- Jessop, Bob, Neil Brenner, and Martin Jones. 2008. "Theorizing Sociospatial Relations." *Environment*

- and *Planning D: Society and Space*, 26: 398–401. DOI:10.1068/d9107.
- Jones, John Paul, III, Keith Woodward, and Sallie A. Marston. 2007. “Situating Flatness.” *Transactions of the Institute of British Geographers*, 34: 264–276. DOI:10.1111/j.1475-5661.2007.00254.x.
- Jones, Katherine. 1998. “Scale as Epistemology.” *Political Geography*, 17: 25–28. DOI:10.1016/S0962-6298(97)00049-8.
- Kaiser, Robert, and Elena Nikiforova. 2008. “The Performativity of Scale: The Social Construction of Scale Effects in Narva, Estonia.” *Environment and Planning D: Society and Space*, 26: 537–562. DOI:10.1068/d3307.
- Leitner, Helga. 2004. “The Politics of Scale and Networks of Social Connectivity: Transnational Urban Networks and the Rescaling of Political Governance in Europe.” In *Scale and Geographic Inquiry: Nature, Society and Method*, edited by Eric Sheppard and Robert B. McMaster, 236–255. Oxford: Blackwell.
- Leitner, Helga, Eric Sheppard, and Kristin M. Sziarto. 2008. “The Spatialities of Contentious Politics.” *Transactions of the Institute of British Geographers*, 33: 157–172. DOI:10.1111/j.1475-5661.2008.00293.x.
- Marston, Sallie A. 2000. “The Social Construction of Scale.” *Progress in Human Geography*, 24: 219–242. DOI:10.1191/030913200674086272.
- Marston, Sallie A., and Neil Smith. 2001. “States, Scales and Households: Limits to Scale Thinking? A Response to Brenner.” *Progress in Human Geography*, 25: 615–619. DOI:10.1191/030913201682688968.
- Marston, Sallie A., John Paul Jones III, and Keith Woodward. 2005. “Human Geography without Scale.” *Transactions of the Institute of British Geographers*, 30: 416–432. DOI:10.1111/j.1475-5661.2005.00180.x.
- Miller, Byron. 1994. “Political Empowerment, Local–Central State Relations, and Geographically Shifting Political Opportunity Structures.” *Political Geography*, 13: 393–406. DOI:10.1016/0962-6298(94)90047-7.
- Moore, Adam. 2008. “Rethinking Scale as a Geographical Category: From Analysis to Practice.” *Progress in Human Geography*, 32: 203–225. DOI:10.1177/0309132507087647.
- Smith, Neil. 1984. *Uneven Development*. Oxford: Blackwell.
- Smith, Neil. 2004. “Scale Bending and the Fate of the National.” In *Scale and Geographic Inquiry: Nature, Society and Method*, edited by Eric Sheppard and Robert B. McMaster, 192–212. Oxford: Blackwell.
- Swyngedouw, Erik. 1997. “Excluding the Other: The Production of Scale and Scaled Politics.” In *Geographies of Economies*, edited by Roger Lee and Jane Wills, 167–176. London: Arnold.
- Taylor, Peter J. 1982. “A Materialist Framework for Political Geography.” *Transactions of the Institute of British Geographers*, 7: 15–34. DOI:10.2307/621909.

Further reading

- Herod, Andrew. 2011. *Scale*. London: Routledge.
- Sheppard, Eric, and Robert B. McMaster, eds. 2004. *Scale and Geographic Inquiry*. Oxford: Blackwell.
- “The Scale Debates” in *Transactions of the Institute of British Geographers*, 2005–2007, vol. 30–32.