

Space and Spatiality

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Glossary

Absolute space Space is understood as a geometrical system of organization (usually Euclidean geometry with x , y and z dimensions) within which people and objects are located and move through. Here, space is understood as natural, given, essential, and measurable.

Cognitive space Space as mentally constructed. While space per se is absolute in nature, to be able to operate in the world and undertake complex spatial choices and decisions people rely on their ability to remember and think about spatial relations. We might occupy absolute space, but we live through cognitive space.

Decolonized space A production of space that seeks to recognize the effects of colonial power on spatial relations, address those effects in emancipatory ways, and reassert traditional and Indigenous spatial imaginaries, practices, and relations, and systems of producing, organizing, and managing space.

Idiographic science A form of science that focuses on the individual or the unique and is illustrated in Geography by a case study approach to people and places.

Ontology The branch of philosophy that studies the nature and operation of reality or being. It concerns the set of specific assumptions about the nature of existence underlying a theory or system of ideas; beliefs about what exists and can be observed, and therefore known.

Ontogenesis A form of ontological thinking that focuses not on what something is, but rather how something becomes. In so doing it rejects the notion that objects or concepts are ontologically secure—fixable, definable, knowable—instead arguing that their ontological status is contingent, relational, and unfolding.

Masculinist space Feminists argue that both absolute and relative conceptions of space are highly masculinist in character, underpinned by a masculinist rationality and reason that seeks to be autonomous, context free, and objective. Space in these terms is masculinist in conception, something that can be rationally and scientifically understood and mastered.

Metaphorical space A kind of relational space wherein the production of space is articulated through metaphor.

Nomothetic science A form of science that involves the search for abstract universal principles, in the case of geography, spatial axioms, and laws about the world

Paradoxical space The notion of paradoxical space recognizes that much about the production of space is unrepresentable and unknowable, given that it is diversely produced by multiple actors and actants who are often working in contradictory ways.

Relational space In contrast to absolute space, relational understandings of space conceive space to be contingent and active, as something that is produced or constructed by people through social relations and practices. Space is not an absolute geometric container in which social and economic life takes place, rather it is constitutive of such relations.

Spatialization A process whereby attributes with no spatial qualities are given spatial form. For example, attributes of size or number might be transformed into attributes of distance, or proximity or territory, producing a metaphorical space that can be visualized and analyzed spatially.

Spatiality The mutual constitution of space and social relations, recognizing the codeterminate ways in which space is shaped by human action, and human action is shaped by space.

TimeSpace The dyadic conjoining of time and space that recognizes that they are mutually constituted and it therefore makes little sense to conceive of them separately; however, TimeSpace extends beyond the idea of four-dimensional space–time (a four-dimensional version of absolute space) to recognize a multiplicity of space–times that are relational, contingent, dynamic, and paradoxical.

Virtual space Space within the realm of technologies such as the Internet that are entirely immaterial, consisting entirely of ones and zeros.

Space is a key geographical concept. Along with other core concepts such as place, landscape, scale, mobility, nature, and environment, it helps define the discipline as one that is explicitly spatial in its focus and thinking. Unsurprisingly, then geography is often described as a spatial science. As such, while human geographers are interested in social, political, cultural, economic, and environmental issues and undertake historical analyses, they do so cognizant of the role of space in shaping the world around us and using theories and methods that illustrate why space and spatial processes matter.

How we conceive of space makes a difference to how we approach and make sense of the geographic world and also to how we understand spatiality. Spatiality refers to the codeterminate relationship between space and social relations—the way in which space is shaped by human action, and human action is shaped by space. The concept of space is often confused with the concept of place,

and in some writing, especially outside the discipline of geography, they are often used interchangeably. Place, however, is more localized in focus referring to the scale and experiences of everyday life, a particular area on the Earth's surface that is the locus for individual and group identity, although it is recognized that places are interdependent and embedded in complex chains of connection with each other. This article details how thinking about space has evolved significantly since the 1950s, focusing, in particular, on how theorists have conceptualized the ontology of space. To illustrate the differences between the various ways of thinking about space, an example of how cities are understood within different ontological frameworks is used.

Absolute Conceptions of Space

Implicitly Absolute Space

Interestingly, given the centrality of space to geographical work, prior to 1950s, it is fair to say that beyond the work of theoretical physics (such as Newton, Leibniz, and Einstein) and branches of philosophy little conceptual work had been undertaken concerning the ontology of space. Geographers, who might have been expected to be most interested in such philosophical thinking, were more concerned about spatial processes across and within space, rather than the nature of space itself. Space was simply understood as a container or backdrop against which things happened; space was implicitly absolute in nature having fixed dimensions across which things could be mapped. As such, while not formally recognized as such by those working at the time, conceptually, space was understood as natural, given, and essential, and spatial processes were construed as teleological and measurable. There was no need to think seriously through the ontology of space as it was beyond question—it was simply the spatial dimensions in which life took place. As a consequence, geography as a discipline was highly descriptive, detailing spatial patterns and processes and the interrelationships between places. Underpinning this kind of geographical research was an exceptionalist belief that geography and its method were unique, being an ideographic science (fact gathering), as evangelized by influential geographers such as Richard Hartshorne, rather than a nomothetic (law-producing) science. Epistemologically empiricist, research was then largely analytically naïve consisting of the accumulation of facts as evidence for generalist theories. From this perspective, cities were understood as unique but related entities and analyzed by mapping patterns of different variables such as commerce, transport, and types of residence and by charting the functional relationships between cities and regions.

Absolute Space

From the early 1950s, a number of geographers started to challenge the status quo in geographical research by arguing that the discipline needed to become more scientific in its thinking and method. For example, Frederick Schaefer, in a paper often cited as the key catalyst for the adoption of a scientific method in human geography, argued that geography should be recast as a science that formulates laws concerning the spatial distribution of phenomena across the surface of the Earth. For Schaefer this meant explicitly recasting the implicit ontology of space using the language of science. Here, space was defined and understood in absolute terms as a geometrical system of organization (usually Euclidean geometry with x , y , and z dimensions) within which people and objects are located and move through. Spatial processes operating within this space could be measured objectively and scientifically, then analyzed using quantitative techniques and spatial statistics. Highly essentialist in formulation, space is effectively reduced to the essence of geometry, its properties natural and given. Importantly, however, the focus of attention was not on space per se, as Kobayashi notes, but on spatial relations and processes in and across space and the relative nature of spatial patterns and relationships within space.

For converts to this new way of thinking, Geography became the science of spatial laws wherein spatial relations could be explained through functional equations and could be modeled and simulated. Such thinking led to the quantitative revolution in geography in the 1960s, with geography recast as a spatial science that sought to detail and explain spatial relations and produces spatial models and laws about spatial distributions and behavior. Although few of these converts referred to the philosophy of positivism in their work, it is clear that many of spatial science's central tenets are drawn loosely from this school of thought. This mode of thinking remains the cornerstone of much spatial science and GIScience research today. Indeed, the advent of big data and the growth of data science in recent years, much of it analyzing spatial big data, has led to a new wave of studies that treat space, if not the relations within it, in absolute terms. From this perspective, cities have an absolute system of geometry that directly shapes spatial processes and behavior and are complex systems of interlocking spatial relationships and laws, which can be calculated, modeled, simulated, and predicted.

Cognitive Space

During the 1970s the concept of absolute space was complemented with that of cognitive space. This perspective argued that while the space in which people live is absolute in nature, it is not perceived or cognized as such. Rather, to be able to operate in the world, to undertake complex spatial choices and decisions, people rely on spatial understandings of places, their ability to remember and think about spatial relations. Consequently, human spatial behavior, and therefore, most spatial processes of note are based on cognitive space—space as mentally constructed. Behavioral geographers and environmental psychologists argued that while we might occupy absolute space, we live in cognitive space, and therefore, we should study the interrelationship between the two. For them, cognitive space is ontologically abstract, representational, and intangible; it is a product of the mind. Epistemologically,

there are two dominant schools—analytic and phenomenological. The first takes a classic psychology approach seeking to scientifically measure and analyze the properties of cognitive space—its components and its geometries—and to model how it approximates to, and is mapped onto, the absolute space of the world. The latter is more concerned with the sense of place and peoples' beliefs, values, understandings, and attachments to particular spaces. For behavioral geographers, cities may well consist of absolute spaces, but spatial behavior and many fundamental spatial processes are founded on cognitive space and how people think spatially about the city.

Relational Conceptions of Space

Relational Space

Also developing from the 1970s onward, as a more explicit counter to the ontology of absolute space, were more relational ontologies of space. These ontologies differed markedly to the concept of relational space as defined in physics and were first explicitly articulated within human geography by radical geographers (e.g., Marxist and feminist scholars) who were challenging the ideas and ideology underpinning spatial science. These theorists argued that spatial science was highly reductionist and that absolute notions of space emptied space of its meaning and purpose and failed to recognize the diverse ways in which space is produced. Space, it was argued, was not a given, neutral, and passive geometry, essentialist and teleological in nature. Instead, space was conceived as relational, contingent, and active, as something that is produced or constructed by people through social relations and practices. Here, there is a recognition that space and spatial relations actively shape social lives. As such, space is not an absolute geometric container in which social and economic life takes place; rather, it is constitutive of such relations.

In such thinking it is recognized that the spaces we inhabit—the built environment, transport systems, the countryside—do not simply exist, preformed, and awaiting meaning. Rather they, and the spatial relations they engender, are produced—made, shaped, managed, and given meaning—by people; they are the products of diverse material and discursive practices that in turn actively shape social relations. Conceived of in these terms, an everyday space like a football stadium can be seen to be both a physical form constructed by certain agents and institutions for particular ends as well as a space, given meaning through myth, language and ritual: its use and occupation is shaped both by its material form and the immaterial meanings that coalesce around it. The Earth is divided into territories, jurisdictions, and is full of various types of spaces (state, region, town, neighborhood, home, shop, factory, park, street, forest, and so on) that are created and experienced in various ways. Importantly, the production of space is contested and can unfold in contradictory and paradoxical ways as different forces play out. This creates diverse spatialities, with the same space producing varying experiences and senses of belonging for different people. Cities are thus composed of relative spaces, produced in contingent and relational ways by people. Epistemologically, what this relational conception of space demanded was a shift from seeking spatial laws to focus on how space is produced and managed to create certain sociospatial relations.

This relational understanding of space is perhaps most fully developed by Henri Lefebvre in his book *The Production of Space*. As Merrifield notes, Lefebvre sought to develop a unitary theory of space that would interlink *physical* space (nature), *mental* space (formal abstractions about space), and *social* space (the space of human action and conflict). Lefebvre suggested that these seemingly different types of space are actually of the same substance and force, each produced through the entwining of three elements, which he determined were key in the making space: spatial practices, representations of space, and spaces of representation (or representational space). Spatial practices refer to the processes, flows, movements, and behaviors of people and things that can be perceived in the world. Representations of space refer to the discursive media (e.g., images, books, films, maps, plans, and so on), which serve to represent the world spatially in order to make sense of it and to think through what is and might be possible. These representations work ideologically to legitimate or contest particular spatial practices and as such do not simply represent space but rather produce space. Spaces of representation are the spaces that are produced by the body in everyday practice; the spaces lived and felt by people as they weave their way through everyday life. The relations among these three elements are complex, and analytical priority cannot automatically be given to one element over the others; but in combination, they bind together Lefebvre's three forms of space (physical, mental, and social) to produce space. Crucially, the relationship between the three elements varies over time and with context, as Lefebvre demonstrated by transforming Marx's periodization of capitalism into a history of spatial production, thus showing how different configurations produced different spatial relations across time and place. In so doing, Lefebvre's work implies that the main struggle in society is one of spatial conflict; of contesting the production of space.

Masculinist and Paradoxical Space

From the early 1980s, feminist geographers have been making important interventions into both disciplinary practices and the foci, theorization and praxis of human geography. Geographers such as Doreen Massey, Susan Hanson, Jan Monk, Linda McDowell, and Gillian Rose and others have highlighted that what counts as geographical knowledge and who produces such knowledge is skewed by the fact that the discipline has been highly dominated by men. As such, they argue, geographical theory and praxis are highly masculinist in character, largely underpinned by a masculinist rationality and reason that seeks to be autonomous, context-free, and objective. As a consequence, they suggest that our understanding of space is similarly masculinist—space is something that can be rationally and scientifically understood and mastered.

In contrast, Gillian Rose in *Feminism and Geography* argues that space is never fully knowable as we can never achieve an all-encompassing, exhaustive god's eye view of the world, only views from particular positions that are differentially shaped. She forwards the notion of paradoxical space—an understanding of space that reflects the researchers' viewpoint while at the same time is sensitive to the myriad ways in which space is experienced and produced by others and acknowledges that there is much about the production of space that is unrepresentable. For her, this involves producing relational geographies that recognize the complex, entangled, and often contradictory power geometries that produce space, rather than constructing grand, all-encompassing theories that seek to tell it like it is and in so doing silence different viewpoints (as with, eg, much Marxist analysis). Rose contends that space is multidimensional, shifting, contingent, and paradoxical. That is, it can simultaneously be produced, experienced, and hold varying meanings for different people. Space from this perspective is at once knowable and unknowable, representable and unrepresentable, produced by complex and often contradictory forces. In such a view, city spaces are diversely produced and understood, and their analysis requires the careful uncovering of their paradoxical nature.

Postcolonial and Decolonized Space

Just as feminists have argued that conceptions of space have been masculinist and paradoxical, postcolonial, critical race, and development scholars have contended that space has been conceived and mobilized in ways that serve colonizing and dominant powers. Space is framed by governments and the military as something to conquer, master, and control; its regulation a means of subjugating local populations. It is no coincidence, Gregory notes, that one of the first acts of colonizers was to map—to chart the absolute space—of a captured territory and the distribution of its peoples and resources. This spatial framing and attendant cartographic endeavors work to erase Indigenous geographic knowledge and conceptions of space, place, and nature. Just as the colonized peoples' languages, customs, and culture are suppressed, so too are their spatial imaginaries, practices, and relations, and their systems of producing, organizing, and managing space. Land is mapped, dispossessed, transferred, and reconfigured, and the production of space became a contested terrain through acts of resistance and transgression. The production of space is thus freighted with uneven power dynamics.

The processes of decolonization vary with context, as Burbank and Cooper show. For many colonized places, decolonization is the act of taking back ownership and power from a colonial sovereign and reintroducing domestic rule. Reasserting traditional and Indigenous ways, including the production of space, however, is not straightforward. Given the dominance of colonial power, its institutional, legal, and cultural legacy is difficult to shift, creating a postcolonial condition. Postcolonial space then is entangled and complex, shaped by contest histories and varied processes. For other places, such as Australia and Canada, where the colonial state is so thoroughly embedded, and the majority of the population considers it the legitimate government, decolonization is, on the one hand, a process of officially recognizing the asymmetrical power relations that produced space and created a colonial spatiality, stole land and possessions, subjugated peoples, and erased Indigenous knowledge and culture. On the other hand, decolonization is acting to atone for those acts, repatriating land and ceding territorial control, compensating losses, eradicating celebrations of colonial power (e.g., removing statues, renaming buildings, and streets), revising histories, and recognizing the legitimacy of knowledge, culture, and alternative forms of producing space. In both cases, a truly decolonial space is an aspiration that is largely unachievable given the deep markings of colonial rule, though the production of space can nonetheless be redressed in ways that emancipatory and empowering. Given Geography's role in colonialism, there are now moves by geographers such as Pat Noxolo and Sarah Radcliffe to decolonize the discipline and its spatial thinking and practices. From this perspective, city spaces are contested territories, produced through asymmetrical power relations that are resisted and challenged by those holding and promoting alternative spatial imaginaries and relations.

Metaphorical Space

Metaphorical space is a particular kind of relational space, most often articulated in disciplines beyond geography, especially literary and cultural studies. It became a popular way to conceive of space from the 1990s onwards. Here, space and its production are seen to take metaphorical qualities that are far removed from absolute conceptions of space. So, for example, the production of city space is seen akin to a text that is written and read (city as text), as organic and living entity (city as body), as a massively complex assemblage of nuts and bolts (city as machine), as a network of flows and fluxes (city as network), and so on. Such metaphorical understandings of space seek to detail the diverse nature of space with respect to its constitution, meaning, function, and complexity that is not always easily captured or expressed in other articulations. In other words, metaphor is used to try to articulate the paradoxical nature of space—to provide a shape to explain complex geographies.

Virtual Space

More recently with the development of Internet technologies, spatial theorists have sought to think through the nature *virtual* space. Often considered as aspatial (spaceless and placeless) by many commentators, as many geographers have demonstrated, virtual space is inherently spatial and possesses diverse spatialities. Online spaces consist of a diverse collection of interlinked domains. Some of these domains are explicitly spatial in nature with direct geographic referents (e.g., virtual reality models of a geographic location), some are explicitly spatial in nature without a geographic referent (e.g., virtual game worlds), some have real-world referents but no explicit spatial form/attributes (e.g., a list of names, a Web page), and some have no or little geographic referents or

spatial form/attributes (e.g., computer file allocation tables). While the latter two lack formal spatial qualities, they are often given spatial form through a process of spatialization, that is, a spatial structure is created through the conversion of defined attributes into spatial attributes (e.g., size to distance/proximity or territory) producing a metaphorical space that can be visualized. All forms of virtual space, however, are very different in nature to geographic space being entirely immaterial, consisting only of ones and zeros, produced through code. Such spaces are free to possess geometries and forms impossible to recreate in geographic space. What this means is that virtual spaces can possess very chaotic geometries that lack Cartesian logic being multidimensional and noncontinuous, where “travel” between domains is nonlinear and rhizomic; every location being each other’s next-door neighbor. And spaces can be both territory and map, with space itself also the means of navigation such as with hypertext in Web pages. From this perspective, cities are complemented with virtual spaces of information, interactions, and transactions that can be mapped onto geographical space in diverse ways.

TimeSpace

So far, the discussion has focused exclusively on space. And yet, everyday life occurs in both time and space. For some geographers it therefore makes little sense to think of time and space as two separate categories as the two are inherently mutually constitutive. They suggest we should think not about time or space but of TimeSpace. The interlinking of time and space in contemporary geography has its roots in work of Torsten Hägerstrand and his notion of time geography developed initially as part of his doctoral research completed in the 1950s and continued throughout his lifetime. Hägerstrand was interested in patterns of settlement, migration, and innovation diffusion over time, often at an individual level, and how they could be understood, modeled, and simulated. For him it was important to place spatial changes into a temporal context in order to map how patterns had evolved. This was not an act of simply producing historical geographies, but of producing explicit time–space paths of movement of people, objects, ideas—literally mapping in four dimensions (x, y, z, and time). This approach contrasted with much other quantitative research during that era, which tended to focus purely on analyzing spatial processes and patterns without placing them fully in a temporal context.

Just as thinking about space has evolved, so has thought concerning the interlinking of space and time. For Hägerstrand these were two interlinked but separate variables (hence the hyphen often used to join them—time–space or space–time). For some contemporary thinkers they are two sides of the same coin (hence the lack of a hyphen to denote they are dyadic—mutually constituted). In their book *TimeSpace* Jon May and Nigel Thrift argue that thinking about time and space as separate categories tends to lead to one being prioritized over the other. This has negative consequences because a prioritization of time produces a historicism that reduces space to a neutral backdrop, and a prioritization of space leads to a spatial imperialism that overemphasizes space at the expense of time. And yet, time and space work in conjunction with each other—everything happens at some time in some place—and so time and space need to be conceptualized as conjoined: TimeSpace.

For them this is not simply thinking of things as four-dimensional space–time (a kind of four-dimensional absolute space), but of recognizing a multiplicity of space–times that are relational, contingent, dynamic, and paradoxical; that our experiences and understandings of TimeSpace are shaped by timetables and rhythms, disciplining regimes, instruments and devices, and various discourses. What these produce is a heterogeneous set of TimeSpaces that are complex, sometimes contradictory, and that need to be carefully mapped, as they demonstrate through a discussion of time–space compression. Most analyses of time–space compression argue for a significant speeding up and shrinking of the world postindustrial revolution due to advances in transport and communications. In contrast they highlight how time–space compression was uneven (across the globe, class, and race), contradictory (just as some things speeded up and others slowed down), worked at different rhythms, and how other technologies had significant impacts on TimeSpace such as power, light, cinema, and so on to restructure in multiple ways, rather than accelerate TimeSpace. From this perspective, geographers need to examine the timespaces of cities, tracing out the various heterogeneous rhythms of daily life.

Ontogenetic Conceptions of Space

All of the conceptions of space outlined above are unified through the examination of the ontology of space, wherein they explore *what space is*. More recently, a group of scholars have begun to challenge such an ontological position and develop and forward ontogenetic conceptions of space. In so doing, they change the central question of enquiry from “what space is” to “*how space becomes*.” Space (and everything else in the world), they argue, is not ontologically secure; a fixable, definable, knowable, predetermined entity that is absolute or relational in nature. Rather, space is always in the process of becoming. Space, in these terms, is a practice; a doing; an event; a becoming—a material and social reality forever (re)created in the moment. Here, space gains its form, function, and meaning through *practice*. Space *emerges* as a process of ontogenesis. As Marcus Doel has pointed out, from this perspective space can be seen as a verb rather than a noun, with him suggesting that term “space” might better be replaced by “spacing” to better capture its ceaseless production. These ideas have been extended to other core concepts underpinning spatial thought such as scale, place, nature, and landscape, recasting each within ontogenetic terms (challenging the ontological security of the concept itself, and rethinking each as emergent in nature).

Michel de Certeau in *The Practice of Everyday Life* sought to move beyond theories centered on representation and behavior to consider *practices* that are constitutive of both. In particular, de Certeau (drawing on Foucault) was interested in how people live

within, negotiate, and challenge circuits of power and the “proper” order of space as reproduced by dominant elites such as the state and corporations. Here, space is outcome of the complex interplay between discursive and material strategies that seek to reproduce places that conform to scientific rationality and desired political economy (using tactics of persuasion, seduction, coercion, domination, intimidation, violence, and so on) and resistive tactics (e.g., avoidance, organizing protest, transgressing social norms, and so on) that seek to create a different spatial order. de Certeau understood tactics as performative, as emerging within a context, so that as individuals go about their daily lives they invent and transform space and actualize spatial possibilities. Space then is always in the process of taking place, the outcome of people seeking to produce particular spatial formations and enact spatial lives.

From a related perspective, Gillian Rose draws on Judith Butler’s theory of performativity to argue that space is the product of relational performances, and it does not pre-exist its production. Space is not simply a pre-existing container awaiting filling, spanning, or construction but is rather space is dynamic and iterative, produced by the citational performances of many interacting people. For Space itself, and thus its production, is brought into being through performativity—through the unfolding actions of people. She thus argues that this produces diverse, unstable, and paradoxical spatialities. In other words, she suggests that a performative understanding of space allows for nuanced analysis that appreciates individual differences across place, time and context, and the paradoxical, contradictory, and complex nature of sociospatial relations as lived and expressed by people.

Drawing on the ideas of Butler et al, among others, Nigel Thrift has developed the notion of nonrepresentational theory. Thrift suggests that the world emerges through spatial practices that are often unreflexive and habitual, that are not easily represented and captured because they are unconscious and instinctive; they are performed without cognitive and rational thought. These human practices are complemented by other actants—animals, objects, machines, circuits, networks—that do diverse work in the world. In particular, Thrift is interested in how new sentient technologies automatically produce space; that is bring space into being without human interference.

Dodge and Kitchin have extended this work by considering how software does work in the world—processing information, making decisions, controlling technologies that shape peoples’ lives in a myriad of ways (how software augments, mediates, controls domestic appliances, transport systems, communications technologies, healthcare, work environments, utilities, financial networks, and so on). Software, they suggest does not simply help produce space, it transduces it—transforms it from one state to another. They argue that space is constantly brought into being as an incomplete solution to on-going relational problems—enabling people to meet or work or play, getting from A to B, and so on. For them, this means that software is helping to transduce different formations of space into being. Two such spaces are what they term code/space and coded space. Code/spaces are spaces dependent on code to transduce them into being, wherein the relationship between code and space is *dyadic*—that is, without code the space would not come into being as intended. For example, checking-in areas at airports are now dependent on software systems to function—the old manual way of checking-in has been discontinued for security reasons. If the software crashes there is no other way of checking passengers in, and the space is produced not as a checking-in area but as a waiting room. Coded space on the other hand is where a transduction is mediated by code, but whose relationship is not dyadic—software mediates the solution to a problem, but it is not the only solution. For example, a PowerPoint presentation transduces the space of a lecture theater, but if the computer crashes the space continues to be produced as a lecture theater although the talk might not be as effective as it might have otherwise been.

The ceaseless production of space articulated by these theorists can be illustrated in many ways. With respect to spatial form it is clear that the world around us is not static and fixed. Instead, spatial forms are constantly being altered, updated, and constructed through the interplay of complex socio-spatial relations in ways that alter, in often subtle and banal ways, the spaces we live in. At a macro-scale there are new local, regional and national development schemes that are enacted daily to transform and regenerate built environments, transport infrastructures, and “natural” landscapes. For example, modifications in road layout, new buildings and infrastructure, additional and reorganized public transport provision, new zones of business and housing, land management schemes such as drainage or irrigation, and so on, that alter the physical landscape and time-space relations of places. At a more micro-scale, infrastructure is modified, repaired, redesigned, and so on, so that streets and rooms are always in a process of being refashioned and remodeled and spatial layouts re-jigged. For example, streets are dug for cabling, shop fronts updated, shop interiors redesigned and maintained, trees are planted, buildings painted, grass mowed, litter dropped and cleaned up, and so on. In other words, the material fabric of space is constantly (re)created through spatial practices that vary in their pacing, so some changes are more immediately noticeable than others. As processes of erosion and entropy at abandoned buildings demonstrate, however, all places are in the course of change, slowly mutating to another state. Similarly, the function of spaces is not static but alter with time (e.g., seasonally—tourist destinations; daily—day and nighttime economy) and the use of space is negotiated and contested between individuals and groups. Spaces thus have multiple functions, and through the daily flux of interactions, transactions and mobilities are always in the process of being made differently.

Urban space then is constantly in flux, being created in the moment as a collective manufacture composed of hundreds of recursive, interconnected relationships between people and place. Cities do not simply exist, fully formed; a still landscape. They are endlessly remade and ceaselessly reterritorialized. Likewise, the meanings associated with spaces shift, ever changing with mood, action, memory, events, and so on. Urban space then is something that happens rather than something that is. Cities emerge ceaselessly through multiple, overlapping spatial practices.

Conclusion

Space, far from being simply the unquestionable backdrop to everyday life, is open to various different ontological conceptualizations. Since the 1950s, geographers along with others have developed a number of different ways to think about space with relative and ontogenetic understandings seeking to replace absolute conceptions. This article has outlined a number of these ways, but it should be noted that beyond geography, theorists of cosmology and physics, and of theology and philosophy, have also continued to produce experimental, observational, and theoretical reflections on space and time.

It is fair to say that the conceptions of space outlined, from implicit to ontogenetic, are today all in use by geographers around the world. For example, absolute conceptions of space still predominate in spatial science and GIScience, and relative conceptions of space are popular with radical, feminist, and postcolonial geographers. For others, such as Audrey Kobayashi, geographical thought has developed to the point where space has become a largely redundant concept with little analytical utility. She argues that the focus of attention is not space per se but spatiality, the intersection of spatial and social processes. As such, she argues that human geographers should stop talking about absolute or relative space and should concentrate on relational spatiality instead. Time will tell if Kobayashi's call will be heeded, but one suspects that geographers' fascination and inventiveness with the concept of space will continue.

See Also: Behavioral Geography; Decolonization; Feminism/Feminist Geography; Human Geography; Internet Geographies; Masculinism; Place.

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