To what extent is the superconcept of ‘system’ applicable to the study of urban geography?
To what extent is the superconcept of ‘system’ applicable to the study of urban geography?

Whilst we continue to group our thoughts and ideas into disciplinary categories that satisfy our understanding of the world, it may be hard to appreciate the effectiveness of a shared domain, in which concepts and ideas may float freely across disciplines. This idea that a concept, arising in one discipline, can be effectively applied in other disciplinary contexts is called a ‘superconcept’ (Wilson, 2010). Not to be mistaken for malleable abstract concepts such as ‘love’ or ‘pain’, a superconcept has very distinct disciplinary roots. In Wilson’s book “Knowledge Power”, it is argued that a ‘system’ can be embraced as a “principal superconcept” (2010, p. 40). In the 1920s, biologists recognized a need to understand the interrelations of organismic parts and processes, rather than the continuous study of individual biological components (Bertalanffy, 1972). Such disciplinary development also fostered the systems-thinking approach in engineering. Whilst traditional biologists defined a system to have physical boundaries with the ability to exchange material with its environment, modern engineers expanded this definition to include abstract boundaries and interrelations (Kiparissides, 2017). Consequently, we now understand a “system” as a set of interdependent components forming a unified whole. However, such a definition has also brought about engineering principles that need to be fulfilled in order to properly classify systems. Namely: (1) A system must achieve a predetermined objective; (2) Interrelationships must exist among the components within the system; (3) The objective of the whole system is of higher precedence than the objective of its subsystems. In the context of urban geography, the study of human settlements, this concept of a system can have a variety of applications. Whether it be the study of cartography, geopolitics, or even urban informal economies, the transfer of a systems-thinking approach from a scientific discipline, such as engineering, to geography not only allows for a more interdisciplinary assessment of geographic issues but also allows geographers to apply new methods of research.

Understanding systems-thinking from engineering allows us to conceptualize urban geographical affairs in a new light. Specifically, cartography can be analysed using systems-thinking in geography. Whether it be a map of the London tube network or an Imperial Federation map showcasing the extent of British colonialism, maps are not only products of technical geographical craftsmanship, but also a compound of a “complex series of interaction” (Harley, 1987). Grounded in their ability to visualize systems at any scale, maps are fundamental to a human’s method of making sense of the world. For example, the Imperial Federation map (Figure 1), published in The Graphic in 1886, is a prime example of how cartography uses systems-thinking to visually represent metaphysical conceptions (Biltcliffe, 2005). By highlighting specific territories in pink, the interrelated depiction of British territorial acquisitions becomes seemingly obvious. This already satisfies the systems principle that interrelationships must exist among individual components. Additionally, by connecting the various territories with a series of trade routes, the map also satisfies the principle that a system is designed to achieve a predetermined objective, namely trade between British territories. Lastly, the surrounding presentation of flora and fauna under banners that read ‘freedom’, ‘fraternity’, and ‘federation’, help underpin the moral sentiment of the system. Thus, the illustrations as well as banners strengthen the idea that the British Empire is grounded on morals and
relationships that reach far beyond the simple trade of goods and services. Resultantly, the final principle of a system is satisfied; the objective of the whole system outweighs the objective of its subsystems. However, one example simply cannot suggest that if something is mappable in a cartographic sense, that it automatically constitutes as a system. The principles of a system, defined in the context of engineering should still be considered. For example, at first glance, cities could be assumed to be systems. Nonetheless, once faced by the system principles, one would need to question whether a city can have a singular objective that overrides the objectives of its subsystems. In cartography, it is vital that every map has an objective in order for the map to have meaning, whether it be to show trade routes, spatial change over time, or even global inequalities. Hence, cartographers would argue that cities cannot be understood as systems because their entirety cannot be simplified down to a singular map (Rodrique, 2013). However, once broken down into its subsystems, a map then can have meaning, which in turn validates it as a system.

Even though it can be argued that the scientific concept of a system in urban geography is mostly applicable to cartography, rather than broader concepts such as cities, some may argue that the systems superconcept does have applications beyond its conventional use. For example, Barentsburg, a city on the Norwegian island of Svalbard, could fit the above criteria for a system. Unlike many settlements, Barentsburg exists purely out of geopolitical reasons (Vox, 2017). As the thickness of the Arctic sea ice decreases, the newly open waters offer new possibilities for extracting natural resources, such as oil and gas reserves. As a result, Polar nations such as Russia, have advanced their strategic geopolitical agenda to take advantage of this future opportunity for resource exploitation (Figure 2). Whether it be planting a Russian flag on the seafloor of the North Pole on July 28, 2007, or funding the failed coal mining industry of Barentsburg in Svalbard, continuous attempts have been made to establish exclusive rights to natural resources in the Arctic continental shelf (Avango, 2010). This is to say that, despite Barentsburg being an isolated, tundric, economic burden for Russia, it is still being funded and maintained in order to obtain a larger objective, namely geopolitical strategy. Additionally, as a settlement, interdependence between people, infrastructure and industry already exists in order for production to take place. With all of these sub-components working towards a larger common goal, it becomes clear that there are instances in which the systems superconcept can also be applied to fields such as geopolitics in the context of urban geography. Recognizing this not only highlights the incentives behind geopolitical strategy, but also strengthens the systems-thinking approach as a tool that can be applied to urban geographical subfields.

However, to use one specific example of a specialized-function city as a model for all other scenarios would be inaccurate. Since urban geography is defined by its layered characteristics, it would be ineffective to use simple criteria for a system to assess all aspects of urban geographical study. Informal economy is a topic of study that can be seen to filter itself into the structure of many urban settlements. Defined by its network of enterprises, trade, and economic activity that is not regulated by the state, one could reason that such an informalized network can also be seen as its own subsystem. With a variety of interrelated components that work alongside each other in a manner that is hazed by its lack of legal
structure, there are many possible greater objectives that should be considered. There are four main reasonings: (1) the Dualist school understands informal economy as an economic safety net for the poor in times of need; (2) the Structuralist school understands informal economy as an opportunity for micro-entrepreneurs to reduce input and labour costs; (3) Legalist schools understands informal economy as a network of brave micro-enterprises; (4) the Voluntarist school understands informal economy to allow individuals to break free from high taxation and regulation (Chen, 2012). To deduce these argumentations to one universal objective would not only be an inaccurate depiction of the informal economy but also limit the application of the systems superconcept in urban geography. Instead, all four argumentations need to be taken into consideration. Seeing as urban geography is vastly different from engineering, it would be reasonable to expect that the principles of a system should be altered to reflect the discipline in which it is applied. Wilson, for example, has outlined characteristics of systems in urban studies to include representation, location, interaction, accounts, scale, and hierarchy, rather than the standard criteria of systems found in engineering (2013, p.41). Such altered principles of systems not only allows the concept of systems-thinking to integrate itself more smoothly into the study of urban geography, but also broadens the definition of a system from an empirical, to a more theoretical one.

It is important to recognize that even though the systems-thinking approach stems from a discipline stereotyped for its stringent assessment of issues, urban geography cannot be studied in this same manner. Thus, the systems superconcept cannot be applied uniformly. This is not to say that systems cannot be applied at all. In fact, the systems superconcept can be seen to have effective applications in the study of urban subsystems which constitute human settlements. In particular cases, human settlements as a whole, such as Barentsburg, can also be accepted as systems. The overarching point is that the study of geography is multifaceted and therefore we must apply systems-thinking to individual issues given their unique circumstances, so that a more appropriate worldview of geography is achieved.

Word Count: 1498
Bibliography


Durham University. (no date) *IBRU: Centre for Borders Research : Arctic maps*. Available at: https://www.dur.ac.uk/ibru/resources/arctic/. [Accessed 2nd December 2017].


Vox. (2017) *It's time to draw borders on the Arctic Ocean*, *YouTube*. YouTube. Available at: https://www.youtube.com/watch?v=Wx_2SVm9Jgo&list=PLJ8cMiYb3G5dRe4rC7m8jDaqodjZeLzCZ&index=2. [Accessed 30th November 2017].
Appendix

Figure 1. Imperial Federation Map. (Biltcliffe, 2005).
Figure 2. Maritime Jurisdiction and Boundaries in the Arctic Region - Russian Claims. (Durham University).