



## Competition, contingency, and destabilization in urban assemblages and actor-networks

Dragos Simandan

To cite this article: Dragos Simandan (2017): Competition, contingency, and destabilization in urban assemblages and actor-networks, Urban Geography, DOI: [10.1080/02723638.2017.1382307](https://doi.org/10.1080/02723638.2017.1382307)

To link to this article: <http://dx.doi.org/10.1080/02723638.2017.1382307>



Published online: 27 Sep 2017.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



# Competition, contingency, and destabilization in urban assemblages and actor-networks

Dragos Simandan

Geography Department, Brock University, St. Catharines, Canada

## ABSTRACT

This intervention contributes to recent work in urban geography that integrates the conceptual frameworks of assemblages and actor-network theory by highlighting two additional directions that require a more rigorous and detailed theorization. The first direction concerns the relationship between contingency and necessity in urban assemblages and actor-networks and this paper delineates four specific propositions as a starting point for further reflection. The second direction suggests that urban assemblages and actor-networks require a more explicit vocabulary for thinking about competition and cooperation within and between cities. To this end, the paper introduces a new concept – delayed asymmetric counterforces – that can foster a better understanding of competition-induced urban change and destabilization. The novel concept is developed in conjunction with a typology of delays in competitive urban dynamics, which helps illuminate how delayed asymmetric counterforces are both a cause and an effect of the complexity inherent in the urban realm.

## ARTICLE HISTORY

Received 24 May 2017  
Accepted 9 September 2017

## KEYWORDS

Competition; delays; uncertainty; urban assemblages; urban actor-networks

## Introduction

In the last few decades, urban geography and urban studies have considerably enriched their theoretical toolbox, adding to their prior thinking in terms of “urban systems” a number of complex theoretical frameworks such as Deleuze and Guattari’s *agencement* (assemblage; Deleuze & Guattari, 1976) and Actor-Network Theory (Latour, 2005). The new frameworks go beyond social constructionism (cf. Sveinsdóttir, 2015; Zerubavel, 2016) and topographical understandings of urban space (Malpas, 2015), to articulate an ontology that acknowledges the importance of the “more-than-human” (Braun & Whatmore, 2010), the metaphysical priority of relations (Connolly, 2011), the role of emergent phenomena (Bennett, 2009), the pervasiveness of radical contingency (cf. Simandan, 2010; Wilson, 2004), as well as a topological account of urban spatiality (Martin & Secor, 2014; Secor, 2013; Simandan, 2016).

The ontological affinity of the two frameworks has recently become the avowed focus for Müller and Schurr’s effort (Müller & Schurr, 2016) to systematically integrate the conceptual universes of actor-network theory and assemblage theory. They proposed three points of cross-fertilization: a spatial, ANT-inspired, account of how urban assemblages can be stabilized (pp. 220–222); an explicit awareness that

ANT is better suited for describing fluid, incremental change, whereas assemblage thinking works best for describing abrupt, sudden, urban change (pp. 222–224); and a transfer and sharing of the idea that desire<sup>1</sup> is productive of socio-material relations from assemblage thinking into Actor-Network Theory (pp. 224–226). However meritorious, this and other similar theoretical efforts<sup>2</sup> in geography and urban studies run the risk of overlooking ontological blind spots that beset both assemblage thinking and actor-networks.

In the remainder of this intervention, instead of working out how the differential pattern of strengths and weaknesses in ANT and assemblage thinking can be used to strengthen both theories, I focus on two areas of conceptual weakness that currently undermine the efficacious application of both assemblage thinking and ANT to urban analysis: the first area concerns the problematic of contingency, the second, that of urban competition. Both of them have already been identified in a recent comprehensive critique of assemblage- and ANT-based approaches to urban studies (Storper & Scott, 2016). The two authors have not minced words to express their reservations about assemblage theoretic approaches: thus, they have criticized them for being jargon-prone, naively descriptive, anecdotal, indiscriminate, apolitical, and eclectic (Storper & Scott, 2016, pp. 1125–1128). To understand the spirit of this critique, it is important to recall that in an earlier paper (Scott & Storper, 2015), the two scholars have advanced their own distinct approach to urban studies centered on the notion of the urban land nexus. Their 2016 paper contrasts favorably their own aforementioned approach with postcolonial urban theory (e.g. Robinson, 2006, 2011; Roy, 2009, 2011), assemblage thinking (e.g. Bender, 2010; Dovey, 2012; Farias, 2010, 2011; McFarlane, 2011a, 2011b, 2011c; Simone, 2014), and planetary urbanism (e.g. Brenner & Schmid, 2014, 2015), in an attempt to prove that their own framework is best suited for urban research. My contribution is in a very different spirit. I do not see assemblage and actor-network approaches as fatally flawed, but instead as imperfect theoretical projects that require ongoing work of conceptual development. The intent is not to look for flaws to justify discarding these theories, but to mend those flaws and thereby improve these frameworks.

### Contingency and necessity in urban assemblages and actor-networks

Contingency and necessity are fundamental ontological categories that require careful conceptual analysis not only because they constitute a key dimension of any metaphysical project, but also because they directly articulate with urban politics (Ben-Menahem, 2009; Wilson, 2004). In describing what is wrong with assemblage and actor-network thinking, Storper and Scott (2016, p. 1126; my emphasis) deplored:

... a largely indeterminate concept of the city as a complex, variegated, multifarious, open-ended, fluid, unique, hybrid, unruly, nonlinear, etc., etc. aggregate of disparate phenomena tied together in a haphazard mix of causal and *contingent relationships*. This concept... is at one level of observation certainly correct, but at another level *interposes mere empirical convolution as a substitute for a deeper and more systematic level of (theoretical) comprehension*.

However harsh, I agree with their assessment, but want to specify it and respond to it with a constructive critique, as follows. ANT and assemblage thinking depict a cityscape ruled by contingency, but this depiction obscures four crucial insights about the conceptual pair contingency *versus* necessity that should be attended to in future work in this vein. To

prevent misunderstandings, I define contingency and necessity as attributes of events and processes. To say that an event or process was necessary means that it was inevitable, inexorable, or “bound to happen”: nothing could have been done to prevent its occurrence. Conversely, an event or process can be labeled “contingent” if it resulted from an improbable, chancy alignment of events, such that in a theoretical re-run of history its occurrence would happen only in a small minority of alternative possible worlds (Simandan, 2010, 2012, 2017). In natural language, telltale indicators for this conceptual pair are the use of the semi-factual “even if” for necessary events (e.g. “Even if we had tried the other two strategies, the tragedy would still have happened. Nobody could possibly have done anything about it.”) and of the close counterfactual “if only” for contingent events (e.g. “If only they had looked the other way, the tragedy could have easily been prevented”; Byrne, 2016). The latter example also helps bring out the fact that in everyday life contingent events are often categorized subjectively, from the standpoint of how they affect us. Thus, we speak of lucky events (beneficial contingency, such as winning the lottery or being in the right place at the right time), unlucky events (detrimental contingency, such as an accident or being in the wrong place at the wrong time), and irrelevant contingencies (chance, unpredictable, happenings in one’s environment without direct bearing on one’s wellbeing or interests). The foregoing definition of contingency and necessity should not be confused with the usage of these terms in critical realism (Sayer, 1995, 2000, 2010). Critical realists deploy the notions of contingency and necessity for two related purposes: firstly, as attributes of relationships, in the context of discussions of the process of rational abstraction, and secondly, as factors to be considered in the analysis of generative causality. To begin with the first context, two objects are necessarily related if they each require the other for them to be what they are (e.g. landlord-tenant). A contingent relationship, on the other hand, is inessential, or structurally unimportant (e.g. the “slots” of the necessary landlord-tenant relationship may happen to be occupied by particular people at particular times, without direct bearing on the importance of analyzing the underlying, “structural”, landlord-tenant relationship). According to critical realists, the process of rational abstraction consists precisely in separating necessary from contingent relationships in order to be able to study the underlying structures constituted by necessary relationships (see also Simandan, 2002, 2005a, 2005b, 2011a). The second context in which notions of necessity and contingency are used by critical realists pertains to the analysis of generative causality. This understanding of causality stems from critical realists’ dissatisfaction with empiricist notions of causality (“If A, then B”). As Andy Pratt has put it (Pratt, 2009, pp. 379):

The realist strategy is to substitute instead the notion of generative causality, where real objects interact and under particular conditions react together to produce, or generate, an effect. Realists refer to ‘necessary’ conditions (to make a reaction work) and ‘contingent’ factors (that may or may not be present: enabling factors). Thus, cause is identifiable and a result of particular mechanisms: ‘real’ mechanisms. However, the simple presence of mechanisms alone does not generate action. This is where context (or space and time) resonates with geographers.

Returning to the theories of focal interest to my argument, it is worth recalling that in both assemblage theory and actor-network theory, contingency is a fundamental feature of social processes and events, reflecting an indeterminate ontology that keeps the future open (to multiple possible materializations) and, therefore, unpredictable. Bearing in mind these definitional clarifications, we can now delineate the four insights

one needs to appreciate before making judgments as to whether an event or process is contingent or necessary (see also, Simandan, 2010).

- (1) The same urban event can be made to appear more contingent or more necessary by varying the level of detail of its description (Ben-Menahem, 2009; Tucker, 2004): events depicted in more detail (“A terrorist attack carried by Al-Qaeda will occur in Berlin in January 2019”) are by mathematical necessity more contingent than less specified depictions (“A terrorist attack will occur in a major European city in the next three years”). This description-sensitivity of events to ascriptions of contingency or necessity renders apparent the blurred lines between urban epistemology (knowing the city) and ontology (the city itself) as well as the politics of representation entailed by that onto-epistemic blurring.
- (2) Contingency and necessity do not constitute dichotomous categories, but instead are best conceptualized on a continuum, with varying degrees of contingency and necessity (Byrne, 2016; Kosko, 1993). This means that ANT and assemblage thinking require going beyond broad brush statements that the city is contingent, in order to analyse and map the varying degrees of contingency encountered in urban socio-material formations.
- (3) Even though contingent ontologies are favoured in both ANT and assemblage thinking in order to support the ethical-political belief in the malleability and changeability of the urban landscape, attention must be paid to the fact that the direction of this change cannot be controlled if the urban assemblage is taken to be *radically* contingent (Bunge, 2006; Cohen & Stewart, 1994, ch. 8). The ability of actors to control their lives and shape the course of events in a desired direction depends on the city being only *moderately* contingent.
- (4) Theorists of both urban assemblages and urban actor-networks need to be aware of the following epistemological predicament: there is no sure, epistemically legitimate way, to prove beyond doubt that an event was necessary or contingent (Bunge, 2006; Dawid, 2000). If this predicament is scaled up to the level of urban politics, it highlights the humble reality that beliefs in a contingent or necessary world constitute ethical and political choices,<sup>3</sup> and not positions that can be empirically verified.

These observations on contingency and necessity provide a useful frame through which to analyse and interpret urban dynamics. Indeed, as the next section will show, the perceived contingency of urban life is in no small measure due to the element of surprise and unpredictability triggered by widespread processes of competition among urban actors.

### **Competition, delays, and destabilization in urban assemblages and actor-networks**

Neither assemblage thinking nor ANT offer a rich vocabulary for conceptualizing the dynamics of competition and cooperation within and between cities. This observation is a more specified variant of the foregoing analysis by Storper and Scott (2016). Thus, they criticized assemblage and actor-network approaches for their “undertheorised presentations of social connectivity” (p. 1127), and for “the absence of concepts of human action” (p. 1127), which make these approaches “unable to detect urban

dynamics, movement, change, and causality in meaningful ways” (p. 1128). If this weakness is left unaddressed, the exciting research programs in the social sciences that focus on the dynamics of competition and cooperation (Axelrod, 2006; Jordan, Jordan, & Rand, 2017; Miller & Page, 2009; Rand, 2016) will not be able to articulate their agendas with those of urban-focused ANT and assemblage thinking. Competition and cooperation are fundamental features of social and ecological processes at all scales of analysis, from neighbourhood dynamics, to networks of global-city regions (Jonas & Moisis, 2016; Scott, 2002; While, Gibbs, & Jonas, 2013). In any given urban field, actors usually compete to maximize an established fitness function (central location; market share; brand recognition; money; fame; quality of mates; number of descendants; political power; cultural influence, etc.) and occasionally to even redefine the fitness function itself (Gerrits & Marks, 2015; Kauffman & Johnsen, 1991; Richter, 2014; Wohl, 2016). Attempts at fitness maximization sometimes occur in zero-sum game urban contexts, whereby the success of one actor entails a loss of fitness for its competitors. Naturally, competitors will respond to one another’s moves in order to prevent a loss of fitness (McNamara, 2013). When actor A takes action X to improve their fitness at the expense of actor B, actor A needs to plan action X with the assumption that actor B will try to counteract it somehow at some point in the future. In other words, the dynamic of urban assemblages or urban actor-networks can be described at its most basic level of analysis in the form of (X; Y) pairs, where Y represents the counterforce actor B is going to use in order to nullify or undo the initial action X, undertaken by rival actor A. Counterforces vary in kind, but almost always they have two attributes that generate fundamental uncertainty: they tend to be asymmetric, and they become apparent and yield results with some unknown delay. “Delayed asymmetric counterforces” is a concept I developed to efficiently encapsulate this information and make it explicit, memorable, and easy to insert into the conceptual apparatus of urban assemblages and urban actor-networks. It thereby helps the planning of strategy by laying bare the known unknown of the situation: just as actor A takes action X to outsmart their competitor, she should expect that competitor to respond with a delayed asymmetric counterforce, that is, with a reaction that is very different from its trigger and that will occur at some unknown point in the future.

Asymmetry of response is a well-documented strategy of urban actors (Freedman, 2015) and its frequency is explained by its success (Thornton, 2007). Competitors respond with moves that play on their own strengths and that contain an element of surprise. Given that their moves tend to play to their strengths, and that any given urban actor has a finite universe of strengths, the element of surprise is thereby bounded by rivals’ selective awareness of one another’s strengths. The idea of asymmetry has already been captured in the theoretical development of strategic studies, as evidenced by the concept of “asymmetric warfare” (Thornton, 2007; for an ethical-political critique, see Winter, 2011) and its often effective instantiation in the form of “urban guerrillas” (Kilcullen, 2015). Asymmetric warfare entails a large scope of analysis or a geographical scale that can exceed the urban realm to encompass whole regions, nations, or ethnic groups (Lloyd, 2014). “Delayed asymmetric counterforces” has a double advantage for urban studies. Firstly, it can be used to study intra-urban competitive dynamics at the micro-scale of the individual actor or small group (specific “counterforces” as opposed to generic “warfare”), therefore opening up a rich universe of information neglected by the

macro-scale concept of asymmetric warfare. Any urban competitive situation, however small, can therefore be analytically reconstructed with the help of this concept (e.g. power dynamic within a family, a neighbourhood, an urban social movement, or an industrial district, etc.). Secondly, the concept of delayed asymmetric counterforces brings to the foreground delays as a source of uncertainty in urban competitive dynamics just as important as the likely asymmetry of the rival's response (Luoma, Ruutu, King, & Tikkanen, 2017). Several types of delays are logically and ontologically entailed by a rival's preparation of a given response. A most basic typology of delays in urban competitive dynamics would emerge by decomposing the four steps of Boyd's OODA loop (OODA stands for observe, orient, decide, and act; see Osinga, 2007):

*Observation delays* are unavoidable and they describe the temporal gap between actor B's undertaking of a given fitness countermove and its perception by affected rival actor A. Strategic use of denial and deception tactics (Godson & Wirtz, 2011) can stretch the length of these type of delays significantly.

*Orientation delays* occur whenever the nature of actor B's countermove is not immediately obvious to actor A. It takes time to monitor the situation, collect the data, connect it with one's prior knowledge, and figure out what it all means in an ever-evolving, shape-shifting, urban assemblage (Hill, Datta, & Acar, 2015).

*Decision delays* happen for a variety of reasons. In McCormack and Schwanen's felicitous words, "the decision is less a discrete moment than it is a space-time of variable duration and intensity through which multiple temporalities fold together" (McCormack & Schwanen, 2011, p. 2808). At the individual level, an urban actor may be "of two minds", unsure how to react to actor's A initial move. This decision paralysis ensures delays in responding. At the urban governance level, decision delays often happen because of the rules of decision-making specific to that institutional ecology. It takes time to organize a meeting of the decision-makers, to go through deliberations at that actual meeting, and to obtain any further approvals from the chain of command (Capoccia, 2015; Olsen, 2008).

*Action delays* take place because of the temporality of causal chains undergirding a given response. Once a decision for a given response has been taken, it takes time to implement that response in an urban assemblage, and it takes time for a set of linked causes to culminate in a given desired effect (Abbott, 2001, 2016; Bunge, 2006). Some of the most effective asymmetric counterforces are precisely those that have already been started but have a long causal gestation time, thereby generating fear, uncertainty, and doubt in rival actor-networks (this is another way to think of the productive role of affect and emotion in urban behavior; cf. Pain, 2009).

To the extent that actor B's countermove is meant to restore the power equilibrium upset by rival actor A's initial move (Allen, 2003; Rose & Miller, 2010), we can conceptualize delayed asymmetric counterforces as negative (balancing) feedback loops operating at the level of the urban assemblage that includes both actors A and B. Simulations in the field of urban dynamics have shown, interestingly, that socio-ecological processes dominated by delayed negative feedback loops very often display oscillatory behaviors (Sterman, 2000). This happens because the unavoidable but poorly anticipated delays in obtaining a desired effect from a course of action trick urban actors into overcompensating and taking more restorative action than necessary (Rahmandad, Repenning, & Sterman, 2009). The pervasiveness of these well-

documented oscillatory urban dynamics needs to inform discussions of the stabilization of assemblages (e.g. Anderson, 2010; Müller & Schurr, 2016). Indeed, wild oscillations such as the real estate cycles of boom and bust destabilize a given urban assemblage even as they occur as unintended and unanticipated consequences of actions taken, ironically, in order to stabilize it (Castree, 2009; Rosa, Dörre, & Lessenich, 2017; Zwart, 2015).

Delays are just as, if not more, important in generating uncertainty as the asymmetric nature of the opponent's counterforce. In undertaking action X, urban actor A does not know either *how* actor B will respond or *when* she will respond (Kluttz & Fligstein, 2016; Miller, 2016). This game of anticipation often leads urban actors to commit one of two adaptive errors (Elster, 2007): “younger brother syndrome” is the error of underestimating one's rival by planning an insufficient or naïve response; conversely, “older brother syndrome” is the error of overestimating one's rival knowledge and resources and therefore planning a response that is excessive and wasteful. Navigating between the Scylla and Charybdis of these twin errors requires ongoing monitoring of rivals and fine-tuning of one's mental models of them.

## Conclusions

Delayed asymmetric counterforces are both a cause and an effect of the complexity and contingency of urban assemblages and actor-networks because they generate “wicked environments” (Hogarth, Lejarraaga, & Soyer, 2015; Simandan, 2011b, 2011c, 2013a, 2013b), that is, contexts in which learning from the effects of one's actions is very difficult because the feedback is delayed, distorted, diluted, confounded, or otherwise compromised (Anand, Mulotte, & Ren, 2016; March, 2010; Rahmandad et al., 2009).

The concept of delayed asymmetric counterforces contributes to the never-ending debate on whether the future of cities is predictable or not (Derickson, 2015, 2017a, 2017b; Piirainen & Gonzalez, 2015; Taleb, 2007) by highlighting the implication that urban assemblages where competitive forces dominate are especially difficult to predict. Urban competition places a strategic premium on surprise and surprise by definition means a violation of expectations (see also Shapiro & Bedi, 2007). Actors in urban assemblages must decide and act under conditions of uncertainty (Grzymala-Busse, 2011; Milliken, 1987; Thietart, 2016) because they rarely know *how* their opponents will react (*asymmetry*) and *when* they will react (*delays* of unknown length). Urban competition, in other words, fosters and thrives on, contingencies of chance, chaos, and (especially) choice (Rescher, 1998).

More philosophically, the idea of “delayed asymmetric counterforces” provides an ontological infrastructure, or a collection of useful presuppositions about how urban competitive dynamics take place, conveniently embedded in a concept that we can begin to routinely use whenever we deploy actor-network theory or assemblage thinking for researching the city. Given that both the depth of our understanding and the effectiveness of our actions depend on the quality of our mental models (Csaszar & Levinthal, 2016; Martignoni, Menon, & Siggelkow, 2016; Stieglitz, Knudsen, & Becker, 2016), the newly proposed concept can act as a building block in the ongoing theoretical scaffolding of urban assemblages and actor-networks.



## Notes

1. Their third cross-fertilization brings to mind a similar early attempt by Nigel Thrift to bring the productive roles of emotion and affect into ANT by means of the concept of dwelling (see Thrift, 1999).
2. A selection of the more recent significant contributions includes Alliez (2015); Anderson, Kearnes, McFarlane, and Swanton (2012); Brenner, Madden, and Wachsmuth (2012); Buchanan (2015); Grossmann and Haase (2016); Hämäläinen and Lehtonen (2016); Marcus and Saka (2006); and Pierides and Woodman (2012).
3. For related discussions, see (Mikkola, 2015) in feminist meta-metaphysics and (Joronen & Häkli, 2016), on politicizing ontology in geography and critical urban theory.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Funding

This work was supported by the Social Sciences and Humanities Research Council of Canada [435-2013-0161].

## References

- Abbott, Andrew. (2001). *Time matters: On theory and method*. Chicago, IL: University of Chicago Press.
- Abbott, Andrew. (2016). *Processual sociology*. Chicago, IL: University of Chicago Press.
- Allen, John. (2003). *Lost geographies of power*. Oxford: Blackwell.
- Alliez, Éric. (2015). Structuralism's afters: Tracing transdisciplinarity through Guattari and Latour. *Theory, Culture & Society*, 32(5–6), 139–158.
- Anand, Jaideep, Mulotte, Louis, & Ren, Charlotte. (2016). Does experience imply learning? *Strategic Management Journal*, 37, 1395–1412.
- Anderson, Ben. (2010). Preemption, precaution, preparedness: Anticipatory action and future geographies. *Progress in Human Geography*, 34, 777–798.
- Anderson, Ben, Kearnes, Matthew, McFarlane, Colin, & Swanton, Dan. (2012). On assemblages and geography. *Dialogues in Human Geography*, 2, 171–189.
- Axelrod, Robert. (2006). *The evolution of cooperation*. New York: Basic Books.
- Bender, Thomas. (2010). Postscript: reassembling the city: Networks and urban imaginaries. In Ignacio Farias & Thomas Bender (Eds.), *Urban assemblages: How actor-network theory changes urban theory* (pp. 303–323). London: Routledge.
- Ben-Menahem, Yemima. (2009). Historical necessity and contingency. In Aviezer Tucker (Ed.), *A companion to the philosophy of history and historiography* (pp. 120–130). Oxford: Wiley-Blackwell.
- Bennett, Jane. (2009). *Vibrant matter: A political ecology of things*. Durham, NC: Duke University Press.
- Braun, Bruce, & Whatmore, Sarah (Eds.). (2010). *Political matter: Technoscience, democracy, and public life*. Minneapolis, MN: U of Minnesota Press.
- Brenner, Neil, Madden, David, & Wachsmuth, David. (2012). Assemblages, actor-networks, and the challenges of critical urban theory. In Neil Brenner, Peter Marcuse, & Margit Mayer (Eds.), *Cities for people, not for profit. Critical urban theory and the right to the city* (pp. 117–137). New York: Routledge.
- Brenner, Neil, & Schmid, Christian. (2014). The 'urban age' in question. *International Journal of Urban and Regional Research*, 38(3), 731–755.

- Brenner, Neil, & Schmid, Christian. (2015). Towards a new epistemology of the urban? *City*, 19 (2–3), 151–182.
- Buchanan, Ian. (2015). Assemblage theory and its discontents. *Deleuze Studies*, 9(3), 382–392.
- Bunge, Mario. (2006). *Chasing reality: Strife over realism*. Toronto: University of Toronto Press.
- Byrne, Ruth M.J. (2016). Counterfactual thought. *Annual Review of Psychology*, 67, 135–157.
- Capoccia, Giovanni. (2015). Critical junctures and institutional change. In James Mahoney & Kathleen Thelen (Eds.), *Advances in comparative historical analysis* (pp. 147–179). Cambridge: Cambridge University Press.
- Castree, Noel. (2009). The spatio-temporality of capitalism. *Time & Society*, 18(1), 26–61.
- Cohen, Jack, & Stewart, Ian. (1994). *The collapse of chaos*. London: Penguin.
- Connolly, William E. (2011). *A world of becoming*. Durham: Duke University Press.
- Csaszar, Felipe, & Levinthal, David. (2016). Mental representation and the discovery of new strategies. *Strategic Management Journal*, 37(10), 2031–2049.
- Dawid, Philip. (2000). Causal inference without counterfactuals. *Journal of the American Statistical Association*, 95, 407–424.
- Deleuze, Gilles, & Guattari, Felix. (1976). *Rhizome*. Paris: Editions de Minuit.
- Derickson, Kate D. (2015). Urban geography I: Locating urban theory in the ‘urban age’. *Progress in Human Geography*, 39(5), 647–657.
- Derickson, Kate D. (2017a). Urban geography II urban geography in the age of Ferguson. *Progress in Human Geography*, 41(2), 230–244.
- Derickson, Kate D. (2017b). Urban geography III: Anthropocene urbanism. *Progress in Human Geography*. Online First.
- Dovey, Kim. (2012). Informal urbanism and complex adaptive assemblage. *International Development Planning Review*, 34, 349–367.
- Elster, Jon. (2007). *Explaining social behavior: More nuts and bolts for the social sciences* (2nd ed.). Cambridge, MA: Cambridge University Press.
- Farias, Ignacio. (2011). The politics of urban assemblages. *City*, 15, 365–374.
- Farias, Ignacio. (2010). Introduction: Decentering the object of urban studies. In Ignacio Farias & Thomas Bender (Eds.), *Urban assemblages: How actor-network theory changes urban theory* (pp. 1–24). London: Routledge.
- Freedman, Lawrence. (2015). *Strategy: A history*. Oxford: Oxford University Press.
- Gerrits, Lasse, & Marks, Peter. (2015). The evolution of Wright’s (1932) adaptive field to contemporary interpretations and uses of fitness landscapes in the social sciences. *Biology & Philosophy*, 30(4), 459–479.
- Godson, Roy, & Wirtz, James (Eds.). (2011). *Strategic denial and deception: The Twenty-first Century challenge*. London: Transaction Publishers.
- Grossmann, Katrin, & Haase, Annegret. (2016). Neighborhood change beyond clear storylines: What can assemblage and complexity theories contribute to understandings of seemingly paradoxical neighborhood development? *Urban Geography*, 37(5), 727–747.
- Grzymala-Busse, Anna. (2011). Time will tell? Temporality and the analysis of causal mechanisms and processes. *Comparative Political Studies*, 44(9), 1267–1297.
- Hämäläinen, Nora, & Lehtonen, Turro-Kimo. (2016). Latour’s empirical metaphysics. *Distinktion: Journal of Social Theory*, 17(1), 20–37.
- Hill, Geoffrey, Datta, Pratim, & Acar, William. (2015). Shifting perspectives: A process model for sense making under uncertainty. *International Journal of Strategic Decision Sciences (IISDS)*, 6 (1), 33–52.
- Hogarth, Robert, Lejarraga, Tomas, & Soyer, Emre. (2015). The two settings of kind and wicked learning environments. *Current Directions in Psychological Science*, 24(5), 379–385.
- Jonas, Andrew E., & Moisiu, Sami (2016). City regionalism as geopolitical processes. A new framework for analysis. *Progress in Human Geography*. Online First.
- Jordan, Matthew R., Jordan, Jillian, & Rand, David G. (2017). No unique effect of intergroup competition on cooperation: Non-competitive thresholds are as effective as competitions between groups for increasing human cooperative behavior. *Evolution and Human Behavior*, 38(1), 102–108.

- Joronen, Mikko, & Häkli, Jouni (2016). Politicizing ontology. *Progress in Human Geography*. Online First.
- Kauffman, Stuart, & Johnsen, Sonke. (1991). Coevolution to the edge of chaos: Coupled fitness landscapes, poised states, and coevolutionary avalanches. *Journal of Theoretical Biology*, 149(4), 467–505.
- Kilcullen, David. (2015). *Out of the mountains: The coming age of the urban guerrilla*. Oxford: Oxford University Press.
- Kluttz, Daniel N., & Fligstein, Neil. (2016). Varieties of sociological field theory. In Seth Abrutyn, *Handbook of contemporary sociological theory* (pp. 185–204). Berlin: Springer International Publishing.
- Kosko, Brian. (1993). *Fuzzy thinking. The new science of fuzzy logic*. New York: Hyperion.
- Latour, Bruno. (2005). *Reassembling the social*. Oxford: Oxford University Press.
- Lloyd, Chris. (2014). *Exploring spatial scale in geography*. New York: John Wiley & Sons.
- Luoma, Jukka, Ruutu, Sampsa, King, Adelaide, & Tikkanen, Henriikki. (2017). Time delays, competitive interdependence, and firm performance. *Strategic Management Journal*, 38(3), 506–525.
- Malpas, Jon (Ed.). (2015). *The intelligence of place: Topographies and poetics*. London: Bloomsbury Publishing.
- March, James G. (2010). *The ambiguities of experience*. Ithaca: Cornell University Press.
- Marcus, George E., & Saka, Erkan. (2006). Assemblage. *Theory, Culture & Society*, 23(2–3), 101–106.
- Martignoni, Dirk, Menon, Anoop, & Siggelkow, Nicolaj. (2016). Consequences of misspecified mental models: Contrasting effects and the role of cognitive fit. *Strategic Management Journal*, 37(13), 2545–2568.
- Martin, Lauren, & Secor, Anna J. (2014). Towards a post-mathematical topology. *Progress in Human Geography*, 38(3), 420–438.
- McCormack, Derek P., & Schwanen, Tim. (2011). Guest editorial: The space-times of decision making. *Environment and Planning A*, 43(12), 2801–2818.
- McFarlane, Colin. (2011a). *Learning the city: Knowledge and translocal assemblage*. Oxford: Wiley-Blackwell.
- McFarlane, Colin. (2011b). On context: Assemblage, political economy and structure. *City*, 15, 375–388.
- McNamara, John M. (2013). Towards a richer evolutionary game theory. *Journal of the Royal Society Interface*, 10(88), 1–9.
- Mikkola, Mari. (2015). Doing ontology and doing justice: What feminist philosophy can teach us about meta-metaphysics. *Inquiry*, 58(7–8), 780–805.
- Miller, Byron. (2016). Spatialities of mobilization: Building and breaking relationships. In Walter Nicholls, Byron Miller, & Justin Beaumont (Eds.), *Spaces of contention: Spatialities and social movements* (pp. 285–298). London: Routledge.
- Miller, Jonathan, & Page, Scott. (2009). *Complex adaptive systems: An introduction to computational models of social life*. Princeton: Princeton University Press.
- Milliken, Frances. (1987). Three types of perceived uncertainty about the environment: State, effect, and response uncertainty. *Academy of Management Review*, 12(1), 133–143.
- Müller, Martin, & Schurr, Caroline. (2016). Assemblage thinking and actor-network theory: Conjunctions, disjunctions, cross-fertilisations. *Transactions of the Institute of British Geographers*, 41(3), 217–229.
- Olsen, Johan P. (2008). The ups and downs of bureaucratic organization. *Annual Review of Political Science*, 11, 13–37.
- Osinga, Frans. (2007). *Science, strategy and war: The strategic theory of John Boyd*. London: Routledge.
- Pain, Rachel. (2009). Globalized fear? Towards an emotional geopolitics. *Progress in Human Geography*, 33(4), 466–486.
- Pierides, Dean, & Woodman, Dan. (2012). Object-oriented sociology and organizing in the face of emergency: Bruno Latour, Graham Harman and the material turn. *The British Journal of Sociology*, 63(4), 662–679.

- Piirainen, Kalle, & Gonzalez, Rafael. (2015). Theory of and within foresight—"What does a theory of foresight even mean?". *Technological Forecasting and Social Change*, 96, 191–201.
- Pratt, Andy. (2009). Critical Realism/Critical realist geographies. In Nigel Thrift & Rob Kitchin (Eds.), *International encyclopedia of human geography* (pp. 379–384). Oxford: Elsevier.
- Rahmandad, Hazhir, Repenning, Nelson, & Sterman, John. (2009). Effects of feedback delay on learning. *System Dynamics Review*, 25(4), 309–338.
- Rand, David G. (2016). Cooperation, fast and slow: Meta-analytic evidence for a theory of social heuristics and self-interested deliberation. *Psychological Science*, 27(9), 1192–1206.
- Rescher, Nicholas. (1998). *Predicting the future: An introduction to the theory of forecasting*. Pittsburg: SUNY press.
- Richter, Hendrik. (2014). Fitness landscapes that depend on time. In Hendrik Richter & Andries Engelbrecht (Eds.), *Recent advances in the theory and application of fitness landscapes* (pp. 265–299). Berlin: Springer.
- Robinson, Jennifer. (2006). *Ordinary cities: Between modernity and development*. London: Routledge.
- Robinson, Jennifer. (2011). Cities in a world of cities: The comparative gesture. *International Journal of Urban and Regional Research*, 35(1), 1–23.
- Rosa, Hartmut, Dörre, Klaus, & Lessenich, Stephan. (2017). Appropriation, activation and acceleration: The escalatory logics of capitalist modernity and the crises of dynamic stabilization. *Theory, Culture & Society*, 34(1), 53–73.
- Rose, Nicholas, & Miller, Peter. (2010). Political power beyond the state: Problematics of government. *The British Journal of Sociology*, 61(s1), 271–303.
- Roy, Ananya. (2009). The 21st-century metropolis: New geographies of theory. *Regional Studies*, 43(6), 819–830.
- Roy, Ananya. (2011). Slumdog cities: Rethinking subaltern urbanism. *International Journal of Urban and Regional Research*, 35(2), 223–238.
- Sayer, Andrew. (1995). *Radical political economy: Critique and reformulation*. Oxford: Blackwell Publishing.
- Sayer, Andrew. (2000). *Realism and social science*. London: Sage.
- Sayer, Andrew. (2010). *Method in social science* (Revised 2nd ed.). London: Routledge.
- Scott, Allen J. (2002). *Global city-regions: Trends, theory, policy*. Oxford: Oxford University Press.
- Scott, Allen J., & Storper, Michael. (2015). The nature of cities: The scope and limits of urban theory. *International Journal of Urban and Regional Research*, 39(1), 1–15.
- Secor, Anna. (2013). 2012 urban geography plenary lecture topological city. *Urban Geography*, 34(4), 430–444.
- Shapiro, Ian, & Bedi, Sonu (Eds.). (2007). *Political contingency: Studying the unexpected, the accidental, and the unforeseen*. New York: New York University Press.
- Simandan, Dragos. (2002). On what it takes to be a good geographer. *Area*, 34(3), 284–293.
- Simandan, Dragos. (2005a). *Pragmatic scepticism and the possibilities of knowledge*. Timisoara: West University Press. ISBN 973-7608-22-4.
- Simandan, Dragos. (2005b). *New ways in geography*. Timisoara: West University Press. ISBN 973-7608-23-2.
- Simandan, Dragos. (2010). Beware of contingency. *Environment and Planning, D, Society and Space*, 28(3), 388–396.
- Simandan, Dragos. (2011a). Is engaged pluralism the best way ahead for economic geography? Commentary on Barnes and Sheppard (2009). *Progress in Human Geography*, 35(4), 568–572.
- Simandan, Dragos. (2011b). Kinds of environments—A framework for reflecting on the possible contours of a better world. *The Canadian Geographer/Le Géographe Canadien*, 55(3), 383–386.
- Simandan, Dragos. (2011c). The wise stance in human geography. *Transactions of The Institute of British Geographers*, 36(2), 188–192. doi:10.1111/tran.2011.36.issue-2
- Simandan, Dragos. (2012). Options for moving beyond the canonical model of regional path dependence. *International Journal of Urban and Regional Research*, 36(1), 172–178.
- Simandan, Dragos. (2013a). Introduction: Learning as a geographical process. *The Professional Geographer*, 65(3), 363–368.

- Simandan, Dragos. (2013b). Learning wisdom through geographical dislocations. *The Professional Geographer*, 65(3), 390-395. doi:10.1080/00330124.2012.693876
- Simandan, Dragos. (2016). Proximity, subjectivity, and space: Rethinking distance in human geography. *Geoforum*, 75, 249-252.
- Simandan, Dragos. (2017). Demonic geographies. *Area*. Early View. doi: 10.1111/area.12339
- Simone, AbdouMaliq. (2014). Relational infrastructures in postcolonial urban worlds. In Stephen Graham & Colin McFarlane (Eds.), *Infrastructural lives. Urban infrastructure in context* (pp. 17-38). New York: Routledge.
- Sterman, John. (2000). *Business dynamics: Systems thinking and modeling for a complex world*. New York: Irwin McGraw-Hill.
- Stieglitz, Nils, Knudsen, Thorbjørn, & Becker, Markus. (2016). Adaptation and inertia in dynamic environments. *Strategic Management Journal*, 37(9), 1854-1864.
- Storper, Michael, & Scott, Allen J. (2016). Current debates in urban theory: A critical assessment. *Urban Studies*, 53(6), 1114-1136.
- Sveinsdóttir, Ásta. (2015). Social construction. *Philosophy Compass*, 10(12), 884-892.
- Taleb, Nassim N. (2007). *The black swan: The impact of the highly improbable*. New York: Random House.
- Thietart, Raymond-Alain. (2016). Strategy dynamics: Agency, path dependency, and self-organized emergence. *Strategic Management Journal*, 37(4), 774-792.
- Thornton, Rod. (2007). *Asymmetric warfare: Threat and response in the 21st century*. Cambridge: Polity Press.
- Thrift, Nigel. (1999). Steps to an ecology of place. In John Allen, Doreen Massey, & Phillip Sarre (Eds.), *Human geography today* (pp. 295-322). Cambridge: Polity Press.
- Tucker, Aviezer. (2004). Holistic explanations of events. *Philosophy*, 79, 573-589.
- While, Aidan, Gibbs, David, & Jonas, Andrew E.G. (2013). The competition state, city-regions, and the territorial politics of growth facilitation. *Environment and Planning A*, 45(10), 2379-2398.
- Wilson, David. (2004). Toward a contingent urban neoliberalism. *Urban Geography*, 25(8), 771-783.
- Winter, Yves. (2011). The asymmetric war discourse and its moral economies: A critique. *International Theory*, 3(3), 488-514.
- Wohl, Sharon. (2016). Considering how morphological traits of urban fabric create affordances for complex adaptation and emergence. *Progress in Human Geography*, 40(1), 30-47.
- Zerubavel, Eviatar. (2016). The five pillars of essentialism: Reification and the social construction of an objective reality. *Cultural Sociology*, 10(1), 69-76.
- Zwart, Frank. (2015). Unintended but not unanticipated consequences. *Theory and Society*, 44(3), 283-297.