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The new mobilities paradigm for a live sociology

Mimi Sheller
Drexel University, USA

Abstract

This article offers an overview of the field of mobilities research, tracing the theoretical antecedents to the study of mobilities both within the classical sociological tradition and at its borders with other disciplines or theoretical schools. It examines how 'the new mobilities paradigm' differs from earlier approaches to globalization, nomadism, and flow, and outlines some of the key themes and research areas within the field, in particular the concepts of mobility systems, mobility capital, mobility justice, and movement-space. In addressing new developments in mobile methodologies and realist ontologies, this review of the field concludes with a call for an emergent vital sociology that is attentive to its own autopoiesis.

Keywords

Immobility, mobile methods, mobility, mobility justice, motility

Over the past decade a new approach to the study of mobilities has been emerging across the social sciences involving research on the combined movements of people, objects, and information in all of their complex relational dynamics. Mobilities research overlaps with some aspects of globalization studies, communications research, migration and border studies, tourism studies, cultural geography, transport geography, and the anthropology of circulation, but it also differs in its scope, foci, and methodologies from each of these. New ways of theorizing mobilities focus attention on embodied and material practices of movement, digital and communicative mobilities, the infrastructures and systems of governance that enable or disable movement, and the representations, ideologies, and meanings attached to both movement and stillness. The so-called mobilities turn also

Corresponding author:
Mimi Sheller, Drexel University, 5011 MacAlister Hall, 3250-60 Chestnut St, Philadelphia, PA 19104, USA.
Email: mimi.sheller@drexel.edu

emphasizes the relation of such mobilities to associated immobilities or moorings, including the political and ethical dimensions of uneven mobility (Hannam et al., 2006). Thus mobilities research is concerned not only with tracing historical and contemporary mobility regimes, technologies, and practices, but also critically addressing normative issues of mobility justice (such as movements for sustainable mobility and mobility rights) and mobility capabilities (such as the demands of social movements for rights of access to the city and transportation justice).

Mobilities research has instigated a creative recombination of existing theoretical traditions, methodological approaches, epistemologies, and even ontologies of a world constituted by relations rather than entities, which is why it is sometimes referred to as a 'new mobilities paradigm' (Sheller and Urry, 2006b) – although this provocative moniker was initially applied with a knowing wink. It combines social, spatial, and critical theory in new ways, and in so doing has provided a transformative nexus for bridging micro-interactional research on the phenomenology of embodiment, the cultural turn and hermeneutics, postcolonial and feminist theory, macro-structural approaches to the state, political-economy and globalization, and elements of science and technology studies (STS), communication, media and software studies. It is neither structuralist nor post-structuralist, but instead advocates for a realist relational ontology for contemporary social science capable of transcending old debates and bridging disciplinary boundaries. It is increasingly recognized as an important addition to the fields of transportation research (Knowles et al., 2008; Shaw and Docherty, 2014), where there has been recognition by transport geographers of the need to 'bridge the quantitative-qualitative divide' (Goetz et al., 2009), migration studies where concerns with 'homing' are as important as moving (Ahmed et al., 2003; Blunt, 2007), tourism studies where places are in motion as much as workers and tourists (Franklin, 2003, 2012; Hannam and Knox, 2010; Sheller and Urry, 2004), and communication and media studies where mobile locative media are increasingly important (De Souza e Silva and Sheller, 2014; Gordon and De Souza e Silva, 2011). It has also influenced more far flung fields including art theory and arts practice (Witzgall et al., 2013), architecture and design (Jensen, 2013, 2014), and new approaches to the archeology of the contemporary world (Graves-Brown et al., 2013).

This article first traces the theoretical antecedents to and influences on the study of mobilities both within the classical sociological tradition and at its borders with other disciplines or theoretical schools. The next section examines how the new mobilities paradigm differs from earlier approaches to globalization, nomadism, and flow, although it is sometimes mistaken for these by critics. The third part outlines some of the key themes and theoretical concepts being developed within the field, in particular the concepts of mobility systems, mobility capital, mobility justice, and performed movement-space. And finally the review addresses the emergence of mobile methodologies, explores their relation to realist ontologies, and concludes with some thoughts on future directions for a 'live' sociology.

Sociology and the mobilities turn

In the sociological canon the term 'mobility' is usually equated with the idea of 'social mobility', referring both to individual movement up or down the hierarchy of

socioeconomic classes and to the collective positional movement of social groups or classes (Sheller, 2014). Unlike the rich tradition of sociological study of social mobility, the new transdisciplinary field of mobilities research encompasses research on the *spatial mobility* of humans, non-humans, and objects; the circulation of information, images, and capital; as well as the study of the physical means for movement such as infrastructures, vehicles, and software systems that enable travel and communication to take place. Thus it brings together some of the more purely 'social' concerns of sociology (inequality, power, hierarchies) with the 'spatial' concerns of geography (territory, borders, scale) and the 'cultural' concerns of anthropology or communication research (discourses, representations, schemas), while inflecting each with a relational ontology of the co-constitution of subjects, spaces, and meanings.

Dating back to the work of Alexis de Tocqueville and Emile Durkheim, sociology has been fundamentally concerned with the relation of social mobility to processes of social change and social stability. Elaborated by Russian sociologist Pitirim Sorokin in his 1927 book *Social Mobility*, this approach to structural sociology and stratification theory became especially influential in the United States. Seymour Martin Lipset and Reinhard Bendix, in their classic *Social Mobility and Industrial Society* (1959) defined social mobility as:

> … the process by which individuals move from one position to another in society – positions which by general consent have been given specific hierarchical values. When we study social mobility we analyze the movement of individuals from positions possessing a certain rank to positions either higher or lower in the social system. (1991 [1959]: 1–2)

This positional understanding of mobility still predominates in US American sociology, and studies of geographical mobility are limited to specific subfields such as migration studies, labor studies, or urban community studies which generally treat mobility as the spatial movement from point A to point B (see Cresswell, 2006). In other words, space is treated as an empty container for social processes, even if geographical movement may effect prospects for social mobility.

Structural approaches to social mobility (and a generally positivist empiricism) still influence the way sociology is taught today and the commonplace assumptions about what the term mobility means. However, there are other sociological traditions that do place more emphasis on the social experience and implications of spatial mobility, especially the Chicago School of urban sociology and some elements of cultural sociology. Sociologists in the 1920s addressed geographical mobility in several respects, including the residential mobility of groups migrating into cities, the daily mobility of urban dwellers and commuters, and the heightened stimuli of fast-paced city life with its new modes of transportation. American sociologists like Robert Park and Ernest Burgess were concerned with the potential negative effects of displacement and social destabilization linked to rapid urban expansion; but they nevertheless valued mobility as a vector for urban growth based on the fundamental capacity for human 'locomotion'. German sociologist Georg Simmel also theorized 'urban metabolism' and the importance of circulation and mobility as crucial aspects of modern urban life, including the mobility not only of people, but also of money. Simmel's 1903 essay 'The metropolis and mental life'

linked the noise, speed, and flow of urban transport to the social shaping of urban experience and the psychological shaping of 'metropolitan individuality' (Simmel, 1997). The work of Erving Goffman has also influenced mobilities scholars working on the micro-interactional coordination of everyday mobility and its performative relation to specific built environments (Jensen, 2013, 2014). Mobilities researchers today are returning to some of these early sociological theorists to begin to rethink the sociology of mobilities.

Yet, as Kaufmann (2011) suggests, the field of urban sociology was early on hived off from specialist subfields such as the study of transportation, migration, or communication. Sociology largely dropped its interest in spatial mobility, while those disciplines interested in spatial mobility developed highly specialized quantitative techniques of measurement and mapping. Mobilities theory was left outside the purview of mainstream US sociology due to the marginalization of early critical theorists and the fragmentation of sociology into policy-oriented subfields (for example, mobility is sometimes understood through the lens of *accessibility* of the built environment both in disability studies and work on transportation justice [Bullard et al., 1997, 2004]). The new transdisciplinary field of mobilities research effectively seeks to reunite some of the specialist subfields that have been evicted from sociological research, including: the spatial mobility of humans, non-humans, and objects; the circulation of information, images, and capital; critical theories of the affective and psychosocial implications of such mobility; as well as the study of the physical means for movement such as infrastructures, vehicles, and software systems that enable travel and communication to take place. But beyond that, it calls on sociology to dispense with the spatial boundaries implied by the term 'society', as suggested by Urry's formative call in *Sociology Beyond Societies*, and to adopt a relational ontology and, as discussed below, mobile methodologies.

Mobilities theory builds on a range of philosophical perspectives to more radically rethink the relation between bodies, movement, and space. First, it draws on phenomenology to reconsider embodied practices and the production of being-in-motion as a relational affordance between the senses, objects, and kinesthetic accomplishments. This is a broad terrain that includes interests in walking, driving, passengering, and other styles or modes of movement, as well as enacted spaces and affordances of the environment. In some cases this is inflected through Goffman's ideas of staging and everyday presentation, or read alongside environmental process philosophy and skilled practice (Ingold, 2011), or in others through Merleau-Ponty's *Phenomenology of Perception* (1962). The recent *Routledge Handbook of Mobilities* (Adey et al., 2014), for example, is organized around the categories of qualities, spaces and systems, materialities, subjects, and events, rather than more traditional topics.

Second, recent work draws on Foucaultian genealogies to unpick the meanings of mobility/immobility as forms of distributed power and subject formation, pointing toward the significance of discourses and visual representations of speed and slowness, the production of normalized mobile subjects and governance through mobilities, and what Bærenholdt (2013) calls 'governmobilities' (cf. Packer, 2008). This strain of mobilities research is more conducive to historical research and archival methods, and also connects to issues of war, violence, surveillance, and visual cultures of mediation (Adey et al., 2013). Mobilities research also draws on anthropological approaches to the

relation between 'routes and roots' (Clifford, 1997), various 'scapes' (Appadurai, 1996), and transnational connections (Hannerz, 1996). These concerns with differential mobilities inform contemporary geographies of mobility that focus on the history of mobility, its modes of regulation, and the power relations associated with it – in short, the politics of mobility (Adey, 2009b; Cresswell, 2006, 2010), if also its poetics (Cresswell, 2011).

Third, and not to be overlooked, some approaches to mobilities draw on postcolonial theory and critical theories of race to rethink the performative politics of racial difference, secured borders, and the governance of mobilities such as migration, sea-space and air-space (Adey, 2010; Sheller, 2004b, 2010). This sensitivity to power differences originates partly out of anthropological studies of migration, diasporas, and transnational citizenship (e.g., Basch et al., 1994; Ong, 1999), and partly out of trenchant postcolonial feminist critiques of the bounded and static categories of race, nation, ethnicity, community, and state within much social science (e.g., Kaplan and Grewal, 1994; Tolia-Kelly, 2010). Indeed the question of intersectional racialized, gendered, classed, and sexual (im)mobilities inscribed into landscapes and imaginaries of belonging are re-emerging as key topics that have been somewhat neglected by the proponents of the mobilities turn.

In sum, mobilities research encompasses not only study of the corporeal travel of people and the physical movement of objects, but also imaginative travel, virtual travel, and communicative travel (Urry, 2007), enabling and coercing (some) people to live more 'mobile lives' (Elliott and Urry, 2010). By bringing together studies of migration, transportation, infrastructure, transnationalism, mobile communications, imaginative travel, and tourism, new approaches to mobility are especially able to highlight the relation between local and global 'power-geometries' (Massey, 1993), bringing into view the political projects inherent in the power relations informing processes of globalization (and thus calling into question associated claims to globality, fluidity, or opening).

Beyond globalization, nomadism, and flow

The current mobilities turn should not be confused with the use of metaphors of flow and liquidity in social theory that have, since the 1990s, captured the attention of social theorists concerned with emergent social processes in a world perceived to be increasingly globally interconnected. Manuel Castells (1996) famously theorized the 'space of flows' as distinct from the 'space of places'. Zygmunt Bauman suggested that there are 'reasons to consider "fluidity" or "liquidity" as fitting metaphors when we wish to grasp the nature of the present, in many ways novel, phase in the history of modernity' (Bauman, 2000: 2). Mobilities theorists share their critique of traditional sociological imagery of the social world as an array of separate 'societies', bounded entities or sedentary containers of geographical propinquity across which separate cultures circulate in a largely face-to-face 'metaphysics of presence' (Urry, 2000, 2007). Yet they do not entirely agree with such 'epochal' claim-making (Savage, 2009) or with currently popular images of a flat world of global connectivity or a smooth world of global 'Empire' (Hardt and Negri, 2000). As Sheller and Urry put it: 'we do not insist on a new "grand narrative" of the global condition as one of mobility, fluidity or liquidity. The new mobilities paradigm suggests a set of questions, theories, and methodologies rather than a totalising

description of the contemporary world' (Sheller and Urry, 2006b: 210). It delineates the context in which both sedentary and nomadic accounts of the social world operate, and it questions how that context is itself mobilized, or performed, through ongoing socio-technical and cultural practices.

It must be acknowledged that many a sociologist, anthropologist, and historian takes immediate offense at the concept of a 'mobilities turn', assuming that it is asserting mobility as a value, as a contemporary state, or as a desired status. We first must dispense with this misapprehension. Early critiques of sedentary metaphors and state territorial forms of power did evoke what some argue was a non-reflexive embrace of deterritorialization, nomadism, and rhizomatic transgression (e.g., in the influential work of Gilles Deleuze and Felix Guattari [1983]). This kind of 'nomadic theory' rests on a 'romantic reading of mobility', and 'certain ways of seeing [arise] as a result of this privileging of cosmopolitan mobility' (Kaplan, 1996; Sheller, 2011). Likewise theorists like Paul Virilio (1977) linked speed to a politics of dromology, but often overlooked friction, slowness, and counter-movements. For mobilities researchers today it is not a question of privileging flows, speed, or a cosmopolitan or nomadic subjectivity, but rather of tracking the power of discourses, practices, and infrastructures of mobility in creating the effects (and affects) of both movement and stasis.

Mobilities are of course the *sine qua non* of globalization; without extensive systems of mobility – and globalist, or neoliberal, claims for opening markets and states to external flows – social processes could not take place at a global scale or be imagined as such. Yet mobilities research is neither a claim that all the world is mobile now, nor a forgetting that the colonial world economy has long entailed extensive global mobilities – e.g., of commodities, printed texts, images, dance forms, music, technologies, capital, and labor both free and enslaved (Rodgers et al., 2014; Sheller, 2003, 2004b) – and, crucially, continues to entail many forms of immobility, both voluntary and forced. While acknowledging and engaging with the macro-level political, economic, cultural, and environmental aspects of globalization, the new mobilities paradigm also differs from theories of globalization in its analytical relation to the multi-scalar, non-human, non-representational, material, and affective dimensions of mobile life. Critical mobilities research interrogates who and what is demobilized and remobilized across many different scales. And it asks in what situations being able to move, to enter, to pass, or to wander versus being able to stay, to dwell, to reside, or to belong might be desired options or coerced, and paradoxically interconnected and co-produced (Adey, 2010; Sheller, 2013). How is (im)mobility produced? How is it performed and performative? How is it repaired and maintained? How is it resisted, remediated, and transduced?

Mobility is historically significant, hence not unique to contemporary times. The claim to a new mobilities paradigm, then, is not simply an assertion of the novelty of mobility in the world today (although the speed, intensity, and technical channeling of various flows are arguably greater than ever before). Research in this field is in fact highly engaged with revealing what is at stake in debates over differentiated mobility, including debates over globalization, cosmopolitanism, postcolonialism or neocolonialism, and emerging forms of urbanism, surveillance, and global governance of various kinds of mobility. If movement and spatial fixity are always co-constituted, then mobilities are a central aspect of both historical and contemporary existence, and are always

being reconfigured in complex ways to support different modes of trade, interaction, and communication. Social mobility and infrastructures of human, technological, and informational mobility were as crucial to the existence of ancient imperial cities, seafaring empires of early modernity, and 19th-century industrializing cities as to the modern mega-cities and mega-regions of today (not to mention non-urban rural and island locations [Vannini, 2011, 2012]). Indeed, a greater theoretical synthesis with traditions of comparative and historical sociology, as well as colonial and postcolonial studies, might help us to better understand the distinctive features of mobility and location in the world today, including the significance of being *locatable* (De Souza e Silva and Sheller, 2014).

The worldwide mobility system is arguably moving people and things differently, in more dynamic, complex, and trackable ways than ever before, while mobile subjects face new challenges of forced mobility, uneven mobility, and disrupted mobility; environmental limits and climate change; and the movement of unpredictable risks. Many parts of the world seem to stand on the cusp of major transformations in existing sociotechnical systems of mobility and communication, despite the apparent 'lock-in' of certain historical structures such as the system of automobility (Dennis and Urry, 2008; Dudley et al., 2011; Urry, 2007). As mobile connectivity begins to occur in new ways across a wide range of mobile devices and 'smart' environments, there is a new convergence between physical movement of people, vehicles, and things; information production, storage, and retrieval; wireless distributed computing and 'smart cities'; and surveillance and tracking technologies. These sociotechnical and cultural transformations in contemporary mobilities not only raise new substantive issues for the social sciences, but are also suggestive of new theoretical and methodological approaches (Sheller and Urry, 2003).

New directions in mobilities theory are also a response to several important feminist critiques of nomadic theory, which pointed out that certain assumptions about mobility were grounded in masculine subjectivities, privileged access to freedom of movement, and ignored the gendered, sexualized, and racialized production of space. Skeggs argued that the (old) mobility paradigm could be linked to a 'bourgeois masculine subjectivity' that describes itself as 'cosmopolitan'; and pointed out that 'mobility and fixity are figured differently depending on national spaces and historical periods' (Skeggs, 2004: 48). Yet recent critical mobilities research also moves on from this kind of disavowal of power, and fundamentally affirms the kind of analysis in which 'Mobility and control over mobility both reflect and reinforce power. Mobility is a resource to which not everyone has an equal relationship' (Skeggs, 2004: 49). It is not a question of privileging a mobile subjectivity, but rather of tracking the power of discourses and practices of mobility in creating effects of both movement and stasis, and uneven distribution of 'network capital' (Elliott and Urry, 2010); thus these critiques have been absorbed into the new mobilities paradigm, which takes the position that power relations are at the heart of the field. Critical mobilities research is crucially concerned with friction, turbulence, immobility, dwelling, pauses, and stillness, as much as speed or flow (Cresswell, 2006, 2010, 2014), and examines how these textured rhythms are co-produced, practiced, and represented in relation to the gendered, raced, classed mobilities and forms of dwelling and 'grounding' of particular others (Ahmed et al., 2003; Tolia-Kelly, 2010; Tsing, 2005).

Mobility systems, mobility capital, and movement-space

Mobilities research has taken seriously 'the material turn' and 'the spatial turn' in the social sciences. At the largest scale, John Urry argues that the complex character of mobility systems stems from the multiple fixities or moorings often on a substantial physical scale that enable other things to be fluid (Urry, 2007). There are interdependent (and intermittent) systems of immobile material worlds and especially some exceptionally immobile platforms (transmitters, roads, stations, satellite dishes, airports, docks, factories) through which mobilizations of locality, labor, and capital are performed – sometime on a global scale – and rearrangements of place and scale materialized and spatially fixed (Hannam et al., 2006). The increase in cross-border transactions and of 'capabilities for enormous geographical dispersal and mobility' go hand in hand with 'pronounced territorial concentrations of resources necessary for the management and servicing of that dispersal and mobility' (Sassen, 2002: 2). Such infrastructures and concentrations of mobile capital – linked to what David Harvey described as 'spatial fixes' and later elaborated as 'spatio-temporal fixes' (Jessop, 2006) – at one and the same time enhance the potential mobility of some, while detracting from the mobility potential (or 'motility') of others by leaving them in a relatively slower or intentionally disconnected position.

Yet other mobilities theorists, influenced by social studies of science and technology, in particular actor-network theory and Bruno Latour's (1987) analyses of 'immutable' and 'mutable mobiles', pay close attention to a whole range of infrastructures, technical objects, prostheses, and embodied practices that assist (or disable) mobility (Büscher et al., 2010; Latour, 1993). Everything from shoes and bikes, mobile phones and motor vehicles, passports and satellites, software code and embedded sensors, laws and zoning codes, are part of the sociotechnical assemblages or human/material hybrids that perform mobility systems (which Cresswell [2014] argues are also always immobility systems, with elements of viscosity, stickiness, coagulation or friction). This is not to say that philosophical approaches are unified, as the field is still open to lively debate. While some writers focus on the relation between mobility and immobility, between movement and infrastructural moorings, and between speed and stillness, others critique these dualistic modes of thinking (Bissell, 2007; Bissell and Fuller, 2009). The work of Gilles Deleuze has also been influential on thinking about assemblages, flows, circulations, and deeper 'media ecologies' which are social and natural, technical and informational, and human and non-human (Fuller, 2005, 2008; Parikka, 2010, 2011).

Drawing on studies of environment and perception, Macnaghten and Urry argued that there are ambivalent and contested 'affordances' that 'stem from the reciprocity between the environment and the organism, deriving from how people are kinaesthetically active within their world' (Macnaghten and Urry, 2000: 169). Like walking, biking, or riding, driving and flying can be included among the active corporeal engagements of human bodies with the sensed world (Ingold, 2011), suggesting many different kinds of affordances between varied bodies, vehicles, and 'movement-space' (Thrift, 2003), including the affects and feelings that these produce. These sensory perceptions and feelings are neither located solely within the person nor produced solely by the car (or bike, or skateboard, or bus, etc.) as a moving object, but occur as a circulation of affects

between different persons, different vehicles, and historically situated mobility cultures and geographies of mobility: 'Motion and emotion' are 'kinaesthetically intertwined and produced together through a conjunction of bodies, technologies, and cultural practices' (Sheller, 2004a: 227). Histories of mobility and place are equally concerned with rhythms, forces, atmospheres, affects, and materialities, whether riding on a steam train, driving an early motor car, or flying in an airplane (Adey, 2010; Edensor, 2014; Merriman, 2012).

Along with spatiality and materiality there is also a growing interest in temporalities. Temporalities of slowness, stillness, waiting, and pauses, are all part of a wider sensuous geography of movement and dwelling in which human navigation of embodied, kinesthetic, and sensory environments are crucial (Dant, 2004; Jensen, 2010; Merleau-Ponty, 1962). Thus mobilities research ranges from the individual body up to the most complex systems. Building on Georg Simmel's ideas of 'urban metabolism' and Henri Lefebvre's 'rhythmanalysis' (Lefebvre, 2004), mobility theorists argue that bodies and objects shape cities, and in turn are shaped, through their rhythms of movement, their pace, and synchrony (Edensor, 2011, 2014). 'Critical mobility thinking' in the field of urban studies also calls for 're-conceptualising mobility and infrastructures as sites of (potential) meaningful interaction, pleasure, and cultural production' (Jensen, 2009: 139), where people engage in 'negotiation in motion' and 'mobile sense making' (Jensen, 2010). Here processes of 'designing mobilities' (Jensen, 2014) have been a focus of attention, intersecting with the disciplines of architecture and design, but also the hybrid interface between physical and digital mobilities in the 'transduction' of 'code/space' which is increasingly automated, ubiquitous, and pervasive (Dodge and Kitchin, 2011).

With an emphasis on the relations between mobilities and immobilities, scapes and moorings, movement and stillness (Hannam et al., 2006: 3), the co-constitutive frictions of differential mobilities and relative velocities are at the heart of recent mobilities research (Cresswell, 2014; Vannini, 2014). Differential capacities and potentials for mobility are analyzed via the concept of 'motility', defined as 'the manner in which an individual or group appropriates the field of possibilities relative to movement and uses them' (Kaufmann and Montulet, 2008: 45). A person may have a high degree of motility without actually moving (for example a well-connected professional who works from home or delegates others to perform physical movements such as deliveries), or they may be among the 'mobility pioneers' who live highly spatially distributed lives yet seek sameness everywhere (Kesselring and Vogl, 2008); while another mobile subject may be involved in much physical displacement, but have low motility in terms of capacities, competencies, and choices, especially if that movement is involuntary (for example someone caught in the grips of a human trafficker, or a child moving between the households of divorced parents).

Here one can also begin to conceptualize 'mobility capital' (Kaufmann et al., 2004) as the uneven distribution of these capacities and competencies, in relation to the surrounding physical, social, and political affordances for movement (with the legal structures regulating who or what can and cannot move being crucial). Uneven mobility capital is crucial to processes of globalization and urbanization, constantly being created by the place-specific demobilizations and remobilizations though which spatio-temporal fixes are remade. Here concerns with the 'right to the city' or 'right to urban life' (Harvey, 2008; Lefebvre, 1968)

become relevant to mobilities research as an approach to time–space, informed by a utopian hope for spatial justice and the extension of basic human mobility rights and capabilities, including the potentials both to be mobile and to reside in a place.

Walls, borders, checkpoints, and gated zones are crucial to the new mobility regimes that produce the securitized corridors, cocoons, and bubbles through or in which certain 'global' flows travel, even as they evict, splinter, or slow other flows (Cwerner et al., 2009; Graham and Marvin, 2001). Thus mobilities research attempts to account for not only the quickening of liquidity within some realms, but also the concomitant patterns of (risky) concentration that create zones of connectivity, centrality, and empowerment in some cases, and of disconnection, social exclusion, and inaudibility in other cases. Processes of 'offshoring' and 'islanding' are central to dominant mobility regimes (Baldacchino, 2010; Sheller, 2009; Urry, 2014), even as peripheries and remote places may become sites of resistance or places for relative 'slowing' such as 'slow tourism' (Bærenholdt and Granås, 2008; Germann-Molz, 2009; Vannini, 2011, 2012, 2014). Complex global mobility systems also go hand-in-hand with tightly coupled systems that are subject to sudden immobilization, as seen in several major disruptions of the air transport network across Europe in 2010, whether due to volcanic ash clouds or common snowstorms (see special issues of *Mobilities*, 6(1)). Relative capabilities for mobility especially come into play with the collapse of mobility systems during disasters such as the aftermath of Hurricane Katrina in New Orleans or the January 2010 earthquake in Port-au-Prince, Haiti, suggesting new ways to critically conceptualize mobility justice within humanitarian projects that mobilize certain kinds of mobility capital while limiting the mobility of others (Sheller, 2013).

This links mobilities research to the field of critical border studies (Cunningham and Heyman, 2004), which understands borders as constituted by the regulation of mobility, i.e., as sites not of fixed geopolitical edges but as legally and illegally crossed by people, by goods, and by cultural flows. Work on mobile borders builds on earlier ideas such as the 'surveillant assemblage' which produced 'data doubles' of each traveler (Haggerty and Ericson, 2000: 606), promoting 'desirable' travelers who are fast-tracked while others are increasingly subject to digital and physical interrogation and expulsion (Lyon, 2008; Popescu, 2011). Now it is argued that the border itself is in motion. Borders are becoming fractal, mobile, virtual spaces as much as material sites of control and resistance; they are marked on bodies and made through various kinds of labor (Vukov and Sheller, 2013). Indeed Deborah Cowen (2010, 2014) argues that the emergence of the logistics network – a blurred seamspace that is both military and civilian, corporate controlled/privatized, and state controlled – is increasingly reshaping the geography of the border. Logistics focuses on securitizing flows, not securitizing a single borderline. These securitized corridors reach further out into transnational space (i.e., US border checks on foreign territory) and deeper into the interior of domestic space (i.e., the Mexico border checkpoints move hundreds of miles into US territory), as does the reach of national security agencies tapping into flows of data and communication. Forced migration and statelessness are also crucial dimensions of contemporary global (im) mobilities, whether due to war and occupation (see Graham [2010] on militarized urbanism) or the potential impacts of global climate change in producing 'climate refugees' (see special issue of *Mobilities*, 6(3)).

Mobility systems are informational as much as they are infrastructural. Emerging 'technoscapes' and 'mediascapes' create new affordances for people to navigate public places and access social environments, whether material or virtual, generating new forms of urban spatiality, transmediality, and public interaction. The concept of 'technoscape', derived from Arjun Appadurai (1996), emphasizes 'that contemporary landscapes are shot through with technological elements which enrol people, space, and the elements connecting people and spaces, into socio-technical assemblages – especially the transportational technologies, such as roads, rail, subways and airports, but also the informational technologies such as signs, schedules, surveillance systems, radio signals, and mobile telephony' (Sheller and Urry, 2006a: 9). Both people and information, bodies and data, move through these technoscapes within the software-embedded and digitally augmented urbanism that some describe as 'sentient cities' (Crang and Graham, 2007), 'networked urbanism' (Graham and Marvin, 2001: 30–33), 'networked place' (Varnelis and Friedberg, 2006), and 'net locality' (Gordon and De Souza e Silva, 2011). Screens and sensors emerge everywhere, moving with users as they move, such that computing will 'become a pervasive part of the urban environment, with even the most mundane device having some computing power and some ability to communicate with other devices, so producing a constant informational hum' (Amin and Thrift, 2002: 102). Wearable computing brings this hum closer and closer to the body.

The notions of 'cybercities' and 'digital cityscapes' (De Souza e Silva and Sutko, 2010) describe a form of contemporary urban development that 'involves the intimate recombination of urban places, the corporeal presence of people's bodies, physical mobilities, and complex, multi-scaled mediations by all sorts of ICT and mobility systems' (Graham, 2004: 113). Here issues of surveillance and privacy, algorithmic prediction, and 'premediation' (Grusin, 2010) emerge as crucial research areas. The various systems throughout a modern city are beginning to maintain persistent memories of their own use, communicate with each other about their status, and even reconfigure themselves based on dynamic needs (Greenfield, 2006). High-density broadband is making Open Data Cities increasingly possible. Within a dynamic urban infrastructure, city-scale services like power (smart grids), data (ubiquitous computing), and transportation (driverless cars and automated highways) are beginning to adapt in real-time through sensors, algorithms, and learning processes. Such systems are anticipatory rather than reactive. Pervasive data-surveillance and forms of continuous real-time calculation – referred to by Nigel Thrift as 'qualculation' (Thrift, 2008) – create an artificial world that is increasingly sentient, and potentially adaptive. This suggests a fundamental change in the everyday practice of mobility, as software delegates coordination to smart and intelligent environments, or leans on them to support already learnt habits and routines.

Finally, the move toward complexity theory within mobilities research highlights processes of feedback, self-organization, and tipping points, which may shape dynamic processes in ways that are not directly caused by reflexive humanist subjects and their agency. As Urry argues, 'All systems are viewed as dynamic and processual, generating emergent effects and systemic contradictions, especially through positive feedback mechanisms' (Urry 2010: 192). Thus mobilities theory branches off into complex systems theory in ways that are deeply grounded in materiality, and depart from the

traditions of social theory that focus on structure *in relation to* (human) agency. This is related to the post-humanist turn (Hayles, 1999) in some Anglo-American theory, especially actor-network theory (Law and Hassard, 1999), which is highly critical of (neo) liberalism and its theory of history as progress. It is also potentially in dialogue with critical realism, with its emphasis on emergent processes and relationality (Archer, 1995). Most importantly for the purposes of social research, these developments are reconceptualizing the idea of the empirical, reconfiguring the relationship between observer and observed, and reinventing methods. Mobilities research leads us to see that along with the political and material relations that structure the world, social science itself – what we *do* with it and what it does – is also at stake here.

Empirical evidence: Mobile methods

More than a decade ago Sheller and Urry (2000) argued that sociology's view of urban life had failed to consider the overwhelming impact of the automobile in transforming the time–space 'scapes' of the modern urban/suburban dweller. Since then a number of important studies of automobility (Merriman, 2007; Norton, 2011; Packer, 2008), historical geographies of road systems and bicycling (Furness, 2010; Merriman, 2009), and ethnomethodological studies of driving and passengering (Dant, 2004; Laurier, 2011; Laurier et al., 2008) have begun to address this lack. Indeed, there has been an explosion of research on mobility systems and their practices, meanings and power relations, as seen not only in the journal *Mobilities*, but also the new journal *Transfers: Interdisciplinary Journal of Mobility Studies*. Encompassing not only human mobility, but also the mobility of objects, information, images, and capital, mobilities research includes study of the infrastructures, vehicles, and software systems that enable physical travel and mobile communication to take place at many different scales simultaneously. Mobilities research thus promotes interdisciplinary or transdisciplinary study, requiring multiple methods that can address the intertwined practices of many different kinds of contemporary (im) mobilities at a variety of scales and speeds.

A diverse range of topics comes within the purview of mobilities research, including tourism, migration, and border studies; mobile communications and software-supported infrastructures (e.g., De Souza e Silva and Sheller, 2014; Gordon and De Souza e Silva 2011); automobility, velomobility, and various kinds of passengering (e.g., Laurier, 2010, 2011; Laurier et al., 2008); children's mobilities, elderly mobilities, and studies of gendered mobilities (Uteng and Cresswell, 2008); walking, climbing, dancing, biking, and other forms of trained bodily movement (e.g., Cresswell and Merriman, 2011; Dewsbury, 2011; Lee and Ingold, 2006; Spinney, 2009, 2011); and studies of the regulation, governance, and legal structures pertaining to all of these. Out of this work came a growing interest in the affective affordances of place and the multisensory performance of mobile places and mobile subjects of various kinds. Research on the sociocultural dimensions of air travel and airports, for example, has generated a new subfield of 'aeromobilities' research (Adey, 2009a; Cresswell, 2006; Cwerner et al., 2009; Urry, 2007). Adey especially emphasizes the sociotechnical production of air-space, the ways in which it is embodied and practiced, and its affective and experiential dimensions (Adey, 2010; Budd and Adey, 2009). Also important are the in-between and liminal places at

which movement is paused, slowed, or stopped: borders, airports, toll roads, hotels, motels, detention centers, refugee camps, etc. (Mountz, 2010).

Yet mobilities research in its broadest sense concerns not only physical movement, but also potential movement, blocked movement, immobilization, and forms of dwelling and place-making (Büscher and Urry, 2009). Issues of uneven motility and of mobility rights, ethics, and justice have become crucial to the field (Bergmann and Sager, 2008; Cresswell, 2006, 2011). It especially requires attention to subaltern (im)mobilities, as well as recognition of the importance of uprooting, dwelling, 'homing', and 'grounding' (Ahmed et al., 2003; Sheller, 2004b). Some have called for new analytical orientations and new methodologies in order to study especially the more ephemeral, embodied, and affective dimensions of interlocking relational (im)mobilities that are not captured using traditional methods (see e.g., Adey, 2009b; Cresswell and Merriman, 2011; Hannam et al., 2006). The point is that mobilities research is not simply about a topic (e.g., things that move, or the governance of mobility regimes, or the idea of an increasingly mobile world), but is even more pointedly a new way of approaching social research, social theory, and social agency.

One of the most important contributions of mobilities research is the lively experimentation with multiple methods, and the creation of new 'mobile methods' that can capture, perform, and even intervene in processes of movement as they happen (see Büscher et al., 2010; Fincham et al., 2010; *Mobilities* 6(2)). As Eric Laurier notes, in these emerging mobile methodologies 'research topic and research resource are confounded, and profitably so' (cited in Büscher et al., 2010: xiv). The generative focus on mobilities has led to methodological innovation as researchers have pushed to find empirical evidence pertinent to the study of mobilities and to invent instruments up to the task of measuring the changing nature of time, space, and motion. New 'mobile methods' are emerging to try to capture some of these complex, dynamic processes, including cyberethnographies, following-the-thing, participant-observation on the move such as walk-alongs (Myers, 2011), drive-alongs (Laurier, 2010), being 'mobile-with' (Bissell, 2009), mobile video ethnography (Spinney, 2011), and various phenomenological approaches, in addition to mixed-method forms of mapping, visualization, future scenario building, action-research and arts-based urban interventions (e.g., Freudendal-Pedersen et al., 2010).

Sheller and Urry's article 'The new mobilities paradigm' called for new research methods that would be 'on the move' and would 'simulate intermittent mobility' (Sheller and Urry, 2006b: 217). Their 'mobile methods' included: interactional and conversational analysis of people as they moved; mobile ethnography involving itinerant movement with people, following objects, and co-present immersion in various modes of movement; after the fact interviews and focus groups about mobility; the keeping of textual, pictorial or digital time–space diaries; various methods of cyber-research, cyberethnography, and computer simulations; imaginative travel using multimedia methods attentive to the affective and atmospheric feeling of place; the tracking of affective objects that attach memories to place; and finally, methods that measure the spatial structuring and temporal pulse of transfer points and places of in-between-ness in which the circulation of people and objects are slowed or stopped, as well as facilitated and speeded (Sheller and Urry, 2006b; and see Urry, 2007). Advancing this program, Büscher

et al. argue that 'Through investigations of movement, blocked movement, potential movement and immobility, dwelling and place-making, social scientists are showing how various kinds of "moves" make social and material realities.' The mobilities turn, they continue, 'open[s] up different ways of understanding the relationship between theory, observation and engagement. It engenders new kinds of researchable entities, a new or rediscovered realm of the empirical and new avenues for critique' (Büscher et al., 2010: 2).

One important area of interest within recent work focuses on the micro-mobilities of the body, from forms of dance, to the bodily rhythms and motion in activities such as bicycling, rock climbing, or walking (Edensor, 2014; Vergunst, 2010); another concentrates on particular subjects, such as tourists, commuters, passengers, or refugees (see Cresswell and Merriman, 2011); and yet others include qualities, subjects, and events (Adey et al., 2014). Empirical data collection includes everything from time–space diaries and participant-observation to the use of mobile video, autobiographical narrative, and bodily immersion of the researcher in mobile activities, or for that matter, moments of paused mobility (Fincham et al., 2010; Vannini, 2009, 2011, 2012), while others examine how interactive technologies generate new modes or capacities for empirical research. Büscher's (2006) work on mobile visualization and interactive design and research processes, for example, is suggestive of the ways in which methods are performative, bringing into being the realities that they are alleged to merely observe (Majima and Moore, 2009). By working collaboratively with designers using mobile visualization technologies, the social researcher becomes a part of the design process, just as technical visualization becomes part of the research process (and its presentation). Other researchers draw on innovative visual methodologies combined with group walking experiences to explore the affective and material dimensions of both interior homescapes and exterior landscapes, particularly for transnational migrant communities (Myers, 2011; Tolia-Kelly, 2006, 2008).

Ultimately, social theory and social research can draw on mobile locative arts, mobile gaming practices, and social networks, not only to develop better understandings of these hybrid spaces and networked places as they emerge from contemporary practice, but also to transform social research itself, its modes of practice and forms of dissemination. Collaborative methods such as 'ethnographically informed design, future laboratories and living labs, and interdisciplinary, collaborative analysis' can be creatively facilitated by research groups such as the Mobilities.lab at Lancaster University 'to enrich understanding of complex socio-technical phenomena and to practically inform policy, design, and socio-technical change' (www.lancs.ac.uk/fass/groups/mobilities–lab/about.htm). Work by Freudendal-Pedersen and collaborators, for example, experiments with 'communities of learning' via 'futures workshops' that bring together social scientists, planners, artists, municipalities, and inhabitants to generate 'spaces of hope' (Freudendal-Pedersen, 2014).

But these are not the only methods employed in mobilities research. There are historical, comparative, and cross-national approaches that are more concerned with the historically and regionally specific patterns of large-scale mobility systems such as motorways (Merriman, 2007), streets and traffic (Norton, 2011) or cycling infrastructure (Furness, 2010), not to mention transnational flows of people (Mountz, 2010, 2011) and global

military logistics (Cowen, 2010, 2014). There are also deeply ethnographic and ethnomethodological studies of the daily experiences of (im)mobility for different groups of people, including understanding how fairly mundane forms of travel and transport are accomplished (see Laurier et al., 2008; Vannini, 2009, 2011). In every case the expansive and innovative outlook of the mobilities paradigm lends new insights to existing research fields, bringing to light alternative perspectives and unnoticed relationships. Above all, it instigates a renewed mission for social science grounded in transdisciplinarity, public relevance, and critical innovation.

Conclusion: Future directions

This article has given a broad overview of the field of mobilities research. While it builds on certain historical traditions within urban sociology and connects to important currents within macro-sociology concerning globalization, flows, and liquidity in the 1990s, the 'mobilities turn' is distinct from these in its philosophical orientations, its empirical diversity, its transdisciplinary openness, and its methodological innovations. It breathes new life into old sociological questions, while bringing new purchase for sociology at the forefront of contemporary social science, critical theory, and philosophy of science. It has generated exciting conversations between sociologists, geographers, anthropologists, historians, architects, urban planners, media and communication theorists, artists, and many other related fields. It also has the potential to inform a wide range of public policy issues because it addresses so many concerns of urgent relevance, such as: refugees and border politics (Amoore and Hall, 2009; Mountz, 2010); sustainable transportation and livable cities (Dudley et al., 2011; Freudendal-Pedersen, 2009); cybercities and military surveillance (Adey et al., 2013; Graham, 2004); the effects of mobile social networks and locative media on urbanism (De Souza e Silva and Frith, 2011; De Souza e Silva and Sutko, 2010); climate change and future fuel systems (Urry, 2008, 2011); and transnational raced and gendered spatialities (Sheller, 2003; Tolia-Kelly, 2010).

While these may appear as disparate subjects when viewed from particular disciplinary perspectives, what mobilities research does is to break down disciplinary silos and thereby enable us to begin to see the connections across topics and scales, and to recognize the potential for more experimental methods to open up a new place for social investigation in contemporary worlds-in-making. Through diverse explorations of mobility-in-practice (as well as their histories), new mobile methods can be deployed as active interventions in an agentic and emergent movement-space, and thus social research can be understood as partly generative or constitutive of the empirical 'field'. Mobile methodologies, in other words, imply an autopoiesis of the empirical and perhaps should be considered part of a morphogenesis of the social within a realist social theory (Archer, 1995) – an area that requires further consideration.

As we seek out new vital methodologies, we can dwell on the provocations of a number of theorists who say that we need 'to invent an art of experiment which can up the methodological ante. … a social science which promotes a rewoven empirics which, most particularly, generates the quality of provocative awareness. That means an experimentalist orientation must be in-built which can start and restart association' (Thrift, 2011: 7–8). Mobilities research is especially well positioned to contribute to

this realm of 'inventive methods' for producing an 'amphibious sociology' (Lury and Wakeford, 2012). It can push us toward 'live methods' (Back and Puwar, 2012), which Back argues 'requires researchers to work on the move in order to attend to the "newly coordinated" nature of social reality. One of our current challenges is to re-invent forms of attentiveness that are mobile and can respond precisely to admit the fleeting, the tacit, the mobile, chaotic and complex' (Back, 2012: 29). This, I believe, is the future direction for the sociology of mobilities as a live, lively, or alive sociology, attentive to its own emergence.

Rather than suggesting any specific future direction in terms of the content of mobilities research, then, I conclude by encouraging its release into a newly conceived practice of sociological research – a reflexive mobilization of the sociological imagination. Mobilities research ultimately can help to reshape academic practice in and for the anthropocene, marshaling new kinds of disciplinary hybrids, institutional bridges, political commitments, and methodological cross-fertilizations to generate transformative approaches to the social-spatial-cultural matrix in which we move, dwell, and build a (hopefully) survivable future. A wider set of questions concerns what sorts of avenues for critique or political action might be opened up by this new perspective. Rather than backing off the claim of a new paradigm 10 years on from its conceptualization, we may instead want to ask: Could the new mobilities paradigm truly generate a paradigmatic shift in the questions we ask, the tools we use, the kinds of evidence we marshal, and the very ways in which we come to know, perceive, and act on our own social reality?

Funding

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Author biography

Mimi Sheller is Professor of Sociology and Director of the Center for Mobilities Research and Policy at Drexel University. She is founding co-editor of the journal *Mobilities*, Associate Editor of *Transfers: Interdisciplinary Journal of Mobility Studies*, and author of the books *Consuming the*

Caribbean (Routledge, 2003), *Democracy After Slavery* (Macmillan, 2000), *Citizenship from Below* (Duke University Press, 2010), and *Aluminum Dreams: The Making of Light Modernity* (MIT Press, 2014). She is co-editor with John Urry of *Mobile Technologies of the City* (Routledge, 2006), *Tourism Mobilities* (Routledge, 2004), and a special issue of *Environment and Planning A* on 'Materialities and Mobilities'.

Résumé

Cet article offre une vue d'ensemble de la recherche sur les mobilités, esq uissant les antécédents théoriques pour l'étude des mobilités au sein de la tradition sociologique classique et aux frontières des autres disciplines et écoles théoriques. L'auteur examine la manière dont le « paradigme des nouvelles mobilités » diffère des précédentes approches de la mondialisation, du nomadisme et des flux. Il esquisse quelques-uns des principaux thèmes et sujets de recherche, notamment les concepts de systèmes de mobilité, de capital de mobilité, de justice de mobilité et d'espace mouvement. En considérant ces nouveaux développements des méthodologies de la mobilité et des ontologies réalistes, l'examen de ce sujet de recherche conclut en appelant de ses voeux une nouvelle sociologie dynamique, attentive au concept d'autopoïèse.

Mots-clés

Mobilité, immobilité, motilité, justice de mobilité, méthodes de mobilité

Resumen

Este artículo ofrece un panoram a general del campo de investigación sobre movilidades, rastreando los antecedentes teóricos para el estudio de la movilidad tanto dentro de la tradición sociológica clásica, como en sus fronteras con otras disciplinas o escuelas teóricas. Examina cómo "el nuevo paradigma de las movilidades" se diferencia de los enfoques anteriores sobre globalización, nomadismo y los flujos, y esboza algunos de los temas clave y las áreas de investigación dentro de este campo, en particular, los conceptos de los sistemas de movilidad, capital de la movilidad, la justicia la movilidad y el movimiento-espacio. Al apuntar a los nuevos desarrollos en metodologías móviles y ontologías realistas, esta revisión del campo concluye con un llamado para una sociología fundamental emergente que está atenta a su propia autopoiesis.

Palabras clave

Movilidad, inmovilidad, motilidad, justicia móvil, Métodos sobre movilidad