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Kevin M. Leander, Nathan C. Phillips and Katherine Headrick Taylor

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Chapter 10

The Changing Social Spaces of Learning: Mapping New Mobilities

Kevin M. Leander
Nathan C. Phillips
Katherine Headrick Taylor
Vanderbilt University

Writing on contemporary culture and social life, sociologists and cultural theorists have been describing new or changing forms of movement, variously described as cultural "flows" (e.g., Appadurai, 1996), "liquid life" (Bauman, 2005), or a "networked society" (Castells, 1996). The change in such movements or mobilities of people, media, material goods, and other social phenomena, including the reach or extension of such movements, connections between "global" and "local" life, the creation of new spaces and places, and new speeds and rhythms of everyday social practice, is arguably the most important contrast between contemporary social life and that of just a decade or two ago. Despite these changes and longer conversations about their meanings in a range of disciplines, mobilities and their relations to learning within education are still understudied and undertheorized.

The present review maps current and relevant engagements with mobility and learning across conceptual and empirical studies. The first section considers the relationship of learning to space and place in educational research, and focuses in particular on the classroom-as-container as a dominant discourse of the field. By "dominant discourse" we intend that the classroom-as-container constructs not only particular ways of speaking and writing in educational research, but also systems of rules concerning how meaning is made (Foucault, 1972). This discourse functions as an "imagined geography" of education, constituting when and where researchers and teachers should expect learning to "take place." This dominant discourse shapes educational research practice and perspectives, we posit, even when research questions cross "in school" and "out of school" borders. Next, in the second section, we consider disruptions and expansions of the classroom-as-container discourse within

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educational research. This section is organized around three expansive metaphors of learning in space–time: learning-in-place, learning trajectories, and learning networks. This critical expansion of boundaries, we argue, involves emerging conceptions and questions concerning learning geographies and mobilities. We consider how the (newly) imagined geographies of place, trajectory, and network critique, interact with, and push open the boundaries of the enclosed classroom as a dominant discourse and historically sedimented geography within education research.

In the third and fourth major sections, we continue to develop these three expansive metaphors of learning and space–time (place, trajectory, and network) as we extend our review into two areas of research that are most often outside of mainstream educational research literature. In the third section, we review empirical work in human and critical geography that examines children's patterns of mobility in different historical periods and in different geographical locations (e.g., Christensen, 2003; Hart, 1977; Karsten, 1998, 2002; 2005; Lareau, 2003; Valentine & McKendrick, 1997). In the fourth section, we examine empirical studies of children's virtual geographies within Internet and media studies (e.g., boyd, 2007; Ito, Okabe, & Matsuda, 2005; Lam, 2000, 2004, 2006, 2009; Skop & Adams, 2009; Thulin & Vilhelmson, 2007; Valentine & S. Holloway, 2001; Valentine & S. L. Holloway, 2002).

In these two sections, our review of research that is typically "extracurricular" to educational studies is aimed at addressing questions we believe are key for understanding children's mobilities across dynamically changing socio-cultural spaces. How, for example, might we reconceive of the relations between physical mobility, virtual mobility, and educational mobility as social phenomena? Further, how does empirical work involving children's movements in physical and virtual spaces extend our understanding and raise questions about learning in place, learning trajectories, and learning networks? With regard to the physical or embodied movements of children, we consider how children's changing practices of moving (and being moved) from place to place, and their changing associations with place, are relevant for theorizing contemporary opportunities to learn.

With regard to virtual mobilities, we consider how children are using new technologies and digital media to build social connections across space–time, produce virtual "places" in online spaces, and otherwise interrupt the spatiotemporal contours of their lives. These two forms of mobility—akin to Appadurai's (1996) "ethnoscapes" and "mediascapes"—shape our binocular vision concerning the contemporary transformation of types of learning, situations for learning, and opportunities to learn. In the fifth section, connections are then built across the empirical studies with an eye toward evidence and equity issues with respect to learning, and possibilities for the study of learning as mobile social practices are discussed.

Prior to exploring the classroom as an imagined and expanding geography, a brief consideration of our perspectives on the relations between learning and mobility is in order. We begin from a sociocultural perspective that takes processes of thinking and learning to be not contained within individual minds, but rather distributed across persons, tools, and learning environments. This perspective, historically and chiefly

inspired by the work of Lev Vygotsky (1978), and as extended by Vygotskian scholars (e.g., Cole, 1996; Cole & Engestrom, 1993; Gutierrez, Morales, & Martinez, 2009; Wertsch, 1991, 1998), may be properly described as "mediational" perspectives on learning as it focuses on mediational tools of all types (e.g., language, material tools, other persons) used in the process of learning. Our commitment in this regard aligns with Gee's (2008) description of an expanded notion of "opportunity to learn" (OTL; p. 76), which pushes beyond traditional psychological perspectives of mind and thought and traces the relations between learners and their experiences in the world. From a sociocultural perspective, questions concerning evidence and equity in education are in principle questions about systems and distributions rather than about individuals alone.

Herein lies our concern with mobilities—because evolving social systems and distributions involving resources for learning that are on the move, or constantly configured and reconfigured, and because people are on the move within such social systems and distributions, then the examination of learning involves an expanded series of questions concerning learning, space, and time. An entire category of inquiry concerns the constitution of places for learning. How do people (on the move) build qualitatively distinct relations with different learning "environments." What does it mean to recast the notion of the "learning environment" to "learning-in-place"?

Another category of inquiry concerns the experience of individuals across places, spaces, and times. For example, how do people traverse or otherwise connect one environment with another in their everyday lives? And, how is opportunity to learn organized and accomplished through trajectories connecting multiple places?

Moreover, in addition to questions concerning place and learning trajectories through them, we raise a category of inquiry concerning how resources, people, and places are brought into relationships through networks or circulations. How are the dynamically moving elements of social systems and distributions, including people themselves and all manner of resources for learning as well, configured and reconfigured across space and time to create opportunities to learn? These categories of inquiry and specific questions suggest the terrain of our perspective in this review, which expands the conversation concerning sociocultural "learning environments" and opportunity to learn to one of "geographies of learning" and "mobilities of learning."

THE CLASSROOM AS AN IMAGINED GEOGRAPHY: OPENING UP THE CONTAINER

If mobilities of learning are new in some fashion, then part of this newness is conceived in relation to something familiar and conventional: the classroom. The classroom is significant not just as a material location in which education research is located (along with the laboratory, which it sometimes reproduces), but also as a conceived or imagined space—an imagined geography of a particular kind. Lefebvre (1991) describes a house in a fashion that critiques how people hold container-like perspectives on the material and social locations of everyday life:

> Consider a house, and a street, for example. The house has six storeys and an air of stability about it. One might almost see it as the epitome of immobility, with its concrete and its stark, cold and rigid outlines . . . Now, a critical analysis would doubtless destroy the appearance of solidity of this house, stripping it, as it were, of its concrete slabs and its thin non-load-bearing walls, which are really glorified screens, and uncovering a very different picture. In the light of this imaginary analysis, our house would emerge as permeated from every direction by streams of energy which run in and out of it by every imaginable route: water, gas, electricity, telephone lines, radio and television signals, and so on. Its image of immobility would then be replaced by an image of a complex of mobilities, a nexus of in and out conduits. (pp. 92–93)

In Lefevbre's analysis, a radically different image of the house is made possible by stripping off the walls and observing flows of energy of every kind, seeing the house as a "complex of mobilities" or an "active body." The everyday image or imagined geography is defined by the walls, and, failing to see them as screens emphasizes their stability and capacity for creating boundaries. In this container-like perspective, space is perceived of as a location in which activity occurs, while Lefebvre's counter-imagination of in and out conduits is one way of representing (social) space as produced through ongoing movements.

One might almost see the classroom as the epitome of immobility as well, representing not only conventions of material structure but also conventions of teaching practice, of schedule, of seating charts, and seatwork routines. If we deliberately "destroy the appearance of solidity," however, what might we observe? What types of materials (books, clay, earthworms, mounds of trash), energies (electricity, gas), resources (federal money, lottery surplus), information flows (Channel One, Internet, parent phone calls) permeate the classroom from every direction? Moreover, what of the diversity of children and adults entering the classroom doors, with their associated histories and geographies? These two conceptions of classrooms or other settings for learning—a container-like perspective on the one hand and a nexus-like perspective on the other—offer a metaphor for the shape of this review, as it works through a transition from one imagined geography of learning to another. Still, containers and networks are not mutually exclusive; even as we focus on new geographies of learning, we recognize that multiple coeval space–times inform our own and others' visions, with significant implications for evidence and equity.

Perhaps much of what maintains the power of the classroom-as-container as the key imagined geography of education is how this conception is highly mobile (somewhat ironically) across teacher, researcher, and policy communities. For teachers, the classroom is the domain of every practice and design—the space within which activity must be managed and the space that can be potentially transformed into a rich place of learning. Researchers create classrooms or classroom-like ensembles: "naturally occurring" groupings for interventions, trials, and controls, or bracket classrooms like small villages for ethnographic work. The microgeography of the contained classroom is reproduced in examinations of classroom conversation and examinations of the small group gathered around the pond. Research and policy work at "larger" scales place the classroom in larger classroom-like containers; the classroom is the fractal of educational research that can be multiplied, expanded, and combined for

"larger" images of learning. Moreover, as a dominant discourse, "the classroom" and its pedagogical practices and relations permeate researcher mindsets about learning in the wild beyond the classroom (the classroom-like "locale" or "situation") such that "out of school learning" is often associated with other classroom-like places. Latour (1983) argued that in the case of Pasteur, science was successful to the extent that it disciplined and constructed the world outside of the laboratory to behave like the laboratory, hence his well-known dictum "Give me a laboratory and I will raise the world." In modern educational science, we might claim a parallel dictum, "Give me a classroom and I will raise the world."

We Have Never Been Roadville

We assume from the outset that classrooms are not merely material spaces that are readily perceived but also conceived spaces (Lefebvre, 1991; Soja, 1989)—representations of space that powerfully shape our attempts at new visions and productions of education. By exploring how classroom-like containers are present in research on learning in "out of school" settings, we might tease out the presence of the *implicit*, or imagined, classroom as a powerful imagined geography of educational research. Possibly few locales have shaped our geographic imagination of learning-in-place as much as Heath's (1983) depiction of the communities of Roadville and Trackton in the Piedmont Carolinas, White and Black (respectively) working-class communities that Heath studied with respect to cultural practices of language and literacy. The work has been modeled and cited ubiquitously; through these patterns Roadville and Trackton have come to stand in for the idea of emplaced culture. (Even Heath notes that there were many "Roadvilles" and "Tracktons" throughout the Piedmont Carolinas [p. 7].) As imagined geographies for educational research, Roadville and Trackton function as evidence that cultural patterns are located and can be found in specific communities, even at very small scales (e.g., Roadville consists of nine families), and that located cultural practices (especially language) come into contact with one another in school.

Roadville and Trackton are constructed as sites for educational evidence and equity by interpreting social and cultural practices as bounded by the physical and social community, and by following a tenet of the ethnography of communication to trace the "limits and features of the situations in which such communication occurs" (Heath, 1983, p. 6). Situated historically, Heath's (1983) method of examining culture practices as located in place participates in a long tradition in anthropology of the analysis of culture in place, which came under increasing critique in the 1990s as the ethnographic "place" began to be reconceived as a "nexus of practice" (Olwig & Hastrup, 1997). Heath (1983) states that she reads local cultural practices, and specifically "face to face networks" in which "each child learns the ways of acting, believing, and valuing those about him" (p. 6) over and against sociodemographic, quantitative, input/output business models of research (p. 8), and against deterministic categories of race and class (p. 3). The primary community for the children—and

in this geographical imagination—is "geographically and socially their immediate neighborhood" (p. 6).

Heath expands beyond a localist perspective on activity by interpreting the two communities through their social history, and primarily that of labor (e.g., mill work) in the Piedmont. This history reaches back to 18th century slave labor, but focuses primarily on the post–Civil War development of the cotton mill industry, and changes in the labor opportunities and management–labor relations throughout the 20th century. She places the two communities into a long stream of history that courses through them as it moves toward the future. Geographically, however, we might consider multiple relations that this localist and historical vision do not immediately render.

What if we conceived of Roadville and Trackton as not merely locales in time, but—to borrow Massey's (2005) definition of social space—as the "simultaneity of stories-so-far" (p. 9)? What if we loosened their boundaries as "sites" and instead examined their simultaneous relations to other places-in-the-making, and to the movement of culture crisscrossing them (e.g., Clifford, 1992)? What if we critiqued our nostalgic visions and considered the messy ways in which Roadville and Trackton, in Latour's (1993) terms, "have never been modern"?

Some of this simultaneous and mobile geographical imagination is clearly present in Heath. In the case of Roadville, for instance, the movements of the White working-class include young people who have moved just 30 miles away to the nearby big city of "Alberta." Heath notes that Alberta-influenced cultural differences—including differences of clothing, hair styles, dance moves—are "carried into Roadville" at times of visiting relatives. In addition to these occasions of actual travel, the mobility of urban locales through popular media and consumerism seems to be continuously present in Roadville, shaping aspirations for the future, home decor, activities for children, and parenting practices. In this manner, family trips out of Roadville for Alberta can be interpreted as embodied enactments of desires and imaginations produced by the traffic of material culture, media culture, and stories of relocated family that are told and retold.

Situating Learning as a Research Act

Although Heath's (1983) ethnographic work may stand in for the idea of bounding or containing culture in the local, in its own formulation and equally in its use by others, research and writing on "situated learning" (e.g., Lave & Wenger, 1991) have contained learning largely within localist visions. Importantly, Lave and Wenger (1991), in their model of learning as "legitimate peripheral participation" in a "community of practice," critique the association of learning "situation" with a "simple location in space and time" (p. 32). The theorists describe how their perspective on situated learning involves a much more multifaceted and relational perspective in which "agent, activity, and the world mutually constitute one another" (p. 33).

Yet, if we turn from the theory of situated learning in Lave and Wenger (1991) toward the specific forms of activity under analysis, the types of ethnographic work and ethnographic places that come under the lens look quite local: nondrinking alcoholics being apprenticed at Alcoholics Anonymous meetings as studied by Carol Cain, butchers being apprenticed in shops from the research of Marshall (1972), and Lave's own study of Vai and Gola tailors, working with apprentices in small commercial shops. These relatively bounded, small scale, local studies are repeated across the sociocultural tradition in key illustrations of theory and within empirical studies: Classic representations of similar imagined geographies of learning include Wertsch's pole vaulters (1991), Cole's and Olga Vasquez's Fifth Dimension sites for after-school learning (Cole, 1996; Vasquez, 2002), and Engestrom's (1993) medical clinic studies. While developing an expanded version of mind and learning as distributed and mediated, theories of distribution within this tradition have been packed rather tightly within local containers.

Still, for conceptualizing learning and mobility, Lave and Wenger (1991) raise a critically significant point concerning the relations between the production of the community and the production of the learner's identity, noting that such community/individual relations raise questions about the "sociocultural organization of spaces into places of activity and the circulation of knowledgeable skill . . ." (p. 55). In empirical work leading to theory building, a more fully relational perspective on mobility and learning will only come into being to the extent that specific relations are followed, traced, and analyzed; the "social" will be lost or epiphenomenal to activity when less visible movements of people, texts, tools, and other cultural resources are bracketed out of activity or assumed to exist through only local visibility.

This brief consideration about the classroom-as-container deliberately stepped well outside of traditional classroom studies in order to show how this dominant discourse and imagined geography organizes and informs contemporary understandings of learning. That is, even in the move outward from the classroom to the ethnographic field, and in the concurrent movements in learning from psychology to anthropology and sociology, classroom activity containers continue their lives without much disruption (although perhaps at a higher level of abstraction). Classrooms, or classroom-like situations, maintain their abilities to corral and organize the local in our analyses of learning. The cultural artifacts and social practices of research in education continually evoke the figured world (Holland, Lachicotte, Skinner, & Cain, 1998) of the classroom. Hence, the possible "selves" or identities of learners are cast in relation to the classroom—their possible and likely activities, their motivations, and their positions with respect to one another. Container-like visions of social spaces of learning—perspectives emphasizing categories, stasis, structures, and located representations over the mobilities of practices—are often recreated, despite attempts to disrupt them. Nevertheless, messy circulations and plural geographies—complex mobilities of practices—have always been on the move, however domesticated by our mappings of locales. Such are the geographies that increasingly haunt our past and current imagination.

RESEARCHING MOBILITIES IN EDUCATIONAL RESEARCH: PLACE, TRAJECTORY, AND NETWORK

If we set about "interpreting beyond the appearance of solidity" (Lefebvre, 1991, p. 92) of the classroom or any other learning "situation," what types of questions might guide our inquiry? How might we reframe evidence? Following, we review three approaches to this larger concern, beginning with learning in place. A perspective on place enables us to consider how a particular locale—a classroom, community, town, after school club, or website—is not an isolated container, but positioned in a *nexus of relations* to other such locales. The simultaneity of multiple locales, and the contact zones between them, become an expanded terrain of examination and evidence concerning learning and place. Additionally, places for learning have distinctive qualities about them that "recruit" or draw learners to them. What are such qualities and how does a perspective on place help us conceive of engagement for learning? How are spaces of resource distribution made into *affectively charged places of learning*?

Second, as classrooms or other sites of learning are seen less as parking lots and more as intersections, then the particular mobilities of people moving through them become a key issue for evidence and equity. How are social groups of people afforded access to *trajectories* across resources for learning, including physical landscapes, discourses and forms of representation, and other tools? How do individuals create their own trajectories or pathways given such affordances?

Third, how are participants in activity not merely "situated" in spaces and times, but rather actively *"networking" learning resources* across space–time in the course of their activity (Nespor, 1994, 1997; Leander, 2001, 2002b)? What are the speeds, rhythms, and frequencies of movements within these networks? How are movements qualitatively different among distinct forms of mobile culture—people, policies, pieces of paper, and megabytes of Internet-transmitted video? Such questions about *learning in place*, *learning trajectories*, and *learning networks* have significant implications for research evidence and equity. They guide our thinking as we review how strains of educational research are increasingly unsettling the relations between learning and the classroom-as-container.

New Directions for Learning-in-Place in Educational Research

Research and experimentation that unsettle notions of "place" in education—that intentionally disrupt the classroom as a bounded space either materially or discursively—have a varied history. To a certain extent, the first (and last) problem of "place" in learning is to understand how to think about place as a multiplicity, a product of interrelations, and thus, as constantly opened up to interactions with other places. Nespor (1997), for instance, argues that to understand the individual fourth graders he studied at "Thurber Elementary," one must also take into account the histories of their neighborhoods, the fragmentation of the African American community in their city, the creation of expressways and railways, public housing, magnet schools, and the children's "lived spaces" that "took their meanings from the ways people did things in them, from the smells and noises and routines of everyday life" (p. 94).

How might we think of place, and especially places of learning, as multiplicities? Discourse analytic work has for some time interpreted the spaces of the classroom in relation to other discourses and texts located "beyond" it, and especially to those of the state, institution, or orders of discourse involving gender, race, culture, sexuality, and others. Such work most often involves reading texts from multiple sites or scales of activity, such as Lee's (1996) interpretations of curriculum alongside and in relation to student–student interactions and student writing, as she analyzes gender production as an outcome of student writing in an Australian secondary geography classroom (see also Anagnostopoulos, 2003). However, for the most part, discourse analytic work has been developed from a logocentric, aspatial perspective; although such work has greatly enriched our critical perspectives on making meaning and the social world, it has had relatively little to offer concerning space, place, or mobility.

Current approaches to social action that include but are not limited to the analysis of discourse are beginning to produce promising frameworks for thinking beyond linguistic theories and texts and toward the interaction of multiple sign systems, bodies, and the material world (Norris, 2004; Norris & Jones, 2004; Scollon & Scollon, 2003). Scollon and Scollon's (2003) approach critiques "placeless" or nonmaterial conceptions of discourse and discursive activity by examining how discourses are located in and indexical to specific material contexts. A key example in their analysis is the street sign. The sign on the street does not offer meaning on its own; rather, it enters into intertextual and dialogic relations with a whole range of other signs, including other actual street signs and other multimodal and linguistic signs in the social world (Bakhtin, 1981). Simultaneously, the sign on the street is indexical to a specific material "place." The material place helps to give meaning and significance to the discourse, just as the (material and discursive) sign serves to give meaning and significance to the place. This notion of how the signs and the material world operate relationally, dialogically, and indexically—termed the *semiotic aggregate* by Scollon and Scollon (2003)—is central to their project of "geosemiotics" and signals one important shift in discourse analysis across the material and discursive hybridity of place-making.

Prior to his untimely death on the first day of 2009, Ron Scollon was taking up mobilities more directly, moving from his earlier considerations of place (Scollon & Scollon, 2003) to questions concerning discourses and material bodies connected across expansive social spaces. In a late, unpublished paper, Scollon (2008) considers the "geography of discourse" of Mt. Ripinsk. The mountain is not merely a material location in Alaska, but is also, for example, a brand image that is pasted onto bottles of micro-brewed beer, which circulate in new material/sign combinations, and become transported by human bodies (e.g., as tee-shirt slogans). From the semiotic aggregate (drawing on Goffman's, 1981, interaction order), Scollon's later (2008) work began to sound nearly Latourian, perhaps reaching for a new ontological ordering of signs and objects on the move. Scollon (2008) expressed the desire to develop the "conceptual software," which he imagined would be geographic information systems (GIS)-like or GIS-enabled, which would "allow us to see directly how someone can go from action to action to get from here to there in this discursive world" (p. 14).

While geosemiotics situates discourse in (material) place, other work in education (e.g., Hirst, 2004; Nespor, 1994, 1997; Willis, 1977) reads the location, control, and regionalization of (children's) bodies in school as discursive ordering (Foucault, 1979). In Nespor's (1997) ethnography of fourth graders at an urban elementary school in Roanoke, Virginia, he offers a critically complex assessment of children's bodies in school spaces. Much of the ethnography disrupts the notion of field "site"; hence, giving site-based "background" information to the study is problematic at best. Yet, across two years of ethnographic work, Nespor describes how "Thurber Elementary" was located and constituted at an intersection of community and city politics, how neighborhoods regionalized children's experiences, offering children in the "same" school very different experiences of the school, and how flows of popular culture and commercialism were powerfully present in children's experiences of social space. Nespor (1997) considers how schooling is involved in the process of abstracting children from social space and from their own bodies. Drawing from Lefebvre (1991), he traces how "people's actual ways of moving through the world" (Lefebvre's "spaces of the body") are replaced through schooling with "the body rendered as a visual display or text readable to an outsider's gaze" (Lefebvre's "body in space"; p. 121). Through control and disciplining of the body in classroom management and other school practices (e.g., single file lines, sitting quietly for long periods of time without moving, regulating the bowels and bladders, p. 128), children undergo a transformation through which "the body ceases to be acknowledged as a tool for mediating relations with the world" (p. 122). The emphasis on the abstracted body is also supported, Nespor argues, through school practices that emphasize written texts and media representations (p. 122). Because of such regulation and abstraction, children's bodies become all the more salient for both teachers and children to interpret in raced, classed, and gendered ways, and exuberant childlike activity (e.g., chase games) become all the more marked as unschooled through social identity construction.

Nespor (1997) raised a number of issues concerning the schooled body and learning in place that are still largely untapped in educational research. In particular, for questions of equity and learning, we might consider how the abstraction of the body in schooled practices and discourses is not "applied" evenly across children: When the body becomes an abstracted site of display over and against a living, engaging body, then dominant power relations and identities of gender, race, class, and other forms of identity have occasion to be reinstantiated. In this manner, conventional practices of abstraction involving bodies are not merely a question of the development of mind, as strong-text theorists (e.g., where literacy is associated with the unique demands of alphabetical writing and the learning of forms of abstraction) such as Ong (1982) would argue, but may well be productive of inequitable opportunities to learn for schooled bodies-in-place (cf. Leander, 2002a).

Although schooled place-making may be evident in the disciplining and abstraction of children's bodies in classrooms, the specific economies of classroom circulations have also been examined as (re)producing stabilities of place. Why is it, despite teachers' best intentions and student participation, that teacher-centered practice

is so intransigent? In order to offer a response, Sheehy (2004) directly associates place-making with the particular economies of ideas and texts in the classroom. In this manner, Sheehy's and others' (discussed in the following text) perspectives on place may be properly considered "network" analyses, drawing on various theories to formulate ideas around networks, which are conceived of as producing "place." The typical classroom economy, which Sheehy terms, after Sack (1997), a "thick place," involves teacher–student–teacher (e.g., initiation–response–evaluation) flows of information and texts, and docile, subdued, and disengaged student bodies. The thick place was defined by stasis and an inward-focus of both bodies and ideas, along narrow pathways. In a "thin place," on the other hand, students were more actively involved in determining the direction of their study as well as the distribution of texts, ideas, and bodies.

> Objects in new space followed numerous paths. Students situated objects with actual towns and an actual school board . . . the boundary made in their typical school practices thinned out; the membrane between their bodies and ideas became permeable, because ideas moved into networks of relations that mattered to them. (Sheehy, 2004, p. 102)

Although the account of "new space" or a "thin place" may feel familiar to those invested in new forms of learning in school, significant in this case is that Sheehy offers an account of stability that is not based on teacher agency and knowledge, policy, student resistance, or other common tropes. Rather, her analysis is based on the notion that new forms of circulation—new movements of ideas, objects, and bodies—are especially difficult to sustain as they come into contact with old space/"thick place." Hence, educational experiments become located in "in-between spaces" until they fall back into common forms of power/knowledge—circulations with deeper space–time grooves in the routines and resources of schooling.

Critical assessments of the disciplining of the body as a feature of schooled practices of the classroom-as-place also raise the question of how freedom of movement for the child—embodied mobility—is associated with the production of positively associated "place." Nespor's ethnography provides a compelling illustration of how experiences of place, and therefore attachments to place, are widely various, embodied through activities, and largely perspectival. For example, although White middle-class teachers may see children's bodies as problems for management and control, positioning their own bodies and viewpoints with this regard (Nespor, 1997), children seem most exuberant and alive outside in the boundary zones beyond the classroom. Drawing on work on "affective filters" (Dulay, Burt, & Krashen, 1982), Gee (2008) notes that learners whose "affective filters" (e.g., a negative response to perceived threat) are high do not have the same opportunity to learn as those whose filters have not been raised, even though, technically speaking, both groups of learning might be said to be in the "same" environment.

How discursive affective "filters" and embodied affective engagements are articulated, and may be understood through new research methodologies, is a complex and

pressing concern in education research. Affectively charged immobilities constraining learning opportunities as well as affectively charged mobilities providing them could permit significant insights into learning-in-place. How do children enter into positive emotional relationships with places of learning? How might we move beyond folk theories emphasizing surface features alone (e.g., classroom decor) or human-centered theories only (e.g., student–teacher relations)? How could school places be made more affectively malleable to become more equitable? Powerful affective relations of place are indicated more broadly in the emerging study of "geographies of fear" in human geography, where specific places are associated in participants' minds with fear or danger. For instance, Kwan's (2008) study of Moslem women in the city can be read as a significant critique of simplistic views on "access" to resources based on material or institutional proximity and circulations alone. Kwan (2008) shows how fear—intensely emotional responses to dynamic cityscapes in post-9/11 U.S. cities—has significantly reduced and constrained Moslem women's circulations, even though their physical accessibility to places may be said to be unchanged.

Others in educational research have also been relatively considering affect and embodiment through the philosophy of Gilles Deleuze and Félix Guattari (1980/1987), and especially their considerations of affective intensities as established through "lines of flight," or unpredictable directions taken in relations among social and affective associations of all kinds. Such associations are arrayed like "rhizomes" (Deleuze & Guattari, 1980/1987), root-like arrangements that extend in multiple directions, and break off. Empirically speaking, Eakle's (2007) object of analysis is the literacy practices of a faith-based school, as such practices move from the classroom to an assembly, and to field trips and a popular motion picture. Eakle studies how texts, spaces, and social practices made available and possible the distances or "ruptures" between particular content and given expressions.

Perhaps more significant than his empirical "results" in this study is Eakle's creative appropriation of Deleuze and Guattari (1980/1987) to establish a spatial research methodology. This methodology, a type of nomadology (Deleuze & Guattari, 1980/1987), works at the interplay between conventions and resisting conserving forces in research—explicitly finding ways to follow "lines of flight" or escape routes in data collection and data analysis. Analytically, for example, Eakle engages in methodologies such as "data walking" (an exploration of data "similar to strolling in physical space," examining the "data traces as a whole" [p. 483]), mapping ("multidirectional free play" [p. 485], but structured by their relation to ethnographic traces), and dramatization (creatively analyzing by setting certain participant perspectives in dramatic form).

Leander and Rowe (2006) also engage with Deleuze and Guattari (1980/1987) to shift an analysis of a literacy performance away from an examination of representations and their meanings and toward the emergence of relations and differences by mapping a performance-in-motion. This "rhizomatic analysis" shifts attention away from fixed meanings and toward action and the new "becomings" that are an important part of literacy performances. The authors argue that the risk of conventional

interpretations is such that, due to their own manipulations of space and time, they can miss or entirely erase the notion that literacy performances are often about creating differences, including differences in the moving, shifting relations of semiotic resources and differences in the performed identities of participants.

Although such Deleuzian or rhizoanalytic work in education (Alvermann, 2000; Hagood, 2004; Kamberelis, 2004; St. Pierre, 1997) is in its early stages and is chiefly concerned with methodological issues, it raises a number of possibilities and key questions for the analysis of learning-in-place (and space). First, such theories and developing methodologies challenge difficult-to-overcome notions of places-as-containers by emphasizing the continual movements and transformations within places. Second, movements are associated with the moment-by-moment affective intensities of a vast range of bodies-in-interaction, including human bodies. As such, the theory nudges us toward an appreciation of engagement as ongoing forms of affective energy rather than merely a gateway to learning. Third, and highly important for rethinking learning-in-place, rhizoanalytic approaches eschew decomposing the notion of "learning environment" a priori into components, such as is common in sociocultural or activity system accounts, and instead treats the "environment" as an assemblage or set of assemblages that is composed in unfolding activity. The spatiotemporal contours of the emergent assemblage are interpreted as critically significant for multiple readings of its effects and emergent possibilities.

New Directions for Learning Trajectories in Educational Research

Relatively recent case studies of identity trajectories imply a critique of studies of identity in classrooms or other settings that rely only on single-event analyses. As an alternative, such studies build up histories of identification and/or learning processes over multiple events. Stanton Wortham's (2004) research perhaps best represents this type of case development of tracing, for example, the production of "Tyisha's" social identity as a "disruptive student." Wortham's cases show the effort and ingenuity that go into the identification process on the parts of all classroom participants, and not just the student who is successfully positioned. The way in which repetition works to stabilize identity over time is perhaps best captured at what Wortham terms an *intermediate timescale* of development (months-long development of categories and identities within a classroom). Tyisha's social identity as a disruptive student is achieved through repeatedly correcting her for being such and through her own repeated and responsive uptake of this position. However, Wortham reminds us that the particularities of the events and settings of repetition matter, and not just repetition as an abstract process. The association (discussed elsewhere as a "lamination," Holland & Leander, 2004) appears to have a particular holding power not merely because it is repeated, but because the repetition happens on a particular sort of occasion when being positioned just so is especially marked or re-markable. The repetition, therefore, is not simply an effect of being located in numerous time–spaces, but an effect of the accrual or accumulation of particularly marked time–spaces that are collected and organized.

Wortham's approach to analyzing how identities are stabilized or objectified across events is further fleshed out in a case concerning "Philip," who after 2 months of interaction in a new middle school science lab group would seemingly become established as a good student who would be in charge of lab processes, but have low social status (2008). Wortham compares entextualization (the process by which signs come to presuppose one another, such that meanings for signs are built up interactionally and not given in advance) as a process descriptive of event-based objectification with "interdiscursive" objectification (Agha, 2007; Wortham, 2006), whereby signs and meanings are connected and reconfigured across events. The interdiscursive relation is clearly the more difficult movement to theorize. Wortham (2008) makes the broader conceptual argument that identity research should consider processes at several relevant timescales (rather than, for instance, just "micro" and "macro" timescales [p. 310]) and that research should also consider how a multiplicity of resources, including social interactions but also curricula, classroom organization, materials, and other academic and nonacademic resources, are involved in processes of objectification. This latter point concerning co-present multiple resources pushes on what could be considered the spatial distribution of identity resources, although the analysis in Wortham is primarily temporal.

Erstad, Øystein, Sefton-Green, and Vasbø (2009) also feature cross-site identity processes prominently in their emerging work in the TransActions research group at the University of Oslo. They currently focus on key resources for identity work that travel across contexts, including "personal histories" and "future orientations," used to create "narratives of the self." The Oslo group argues that such narratives are "central to productive learning" (Erstad et al., 2009, p. 100). This learning, which occurs across the permeable boundaries of formal and informal, school and out-of-school, is posited as a connective, in between process; narrativization is a key means of stitching a life trajectory across time. Zacher (2009) presents a nuanced spatiotemporal account of the identity practices of one fifth-grade child, "Christina," who often constructed her own identity as Latina, even though, according to her parents, she was White. Through school-based ethnography and interview analysis, Zacher shows how Christina uses the classroom (and its social justice curriculum), as well as social spaces outside the school, as resources: "Christina redrew her racial identity map every day, adding new locations, new people, new supporting characters and threads" (p. 275). For instance, Zacher examines how Christina's decision to ride the city bus to school allowed her to construct an identity as "more urban, grown up, and independent in her peers' eyes, especially compared to the other White girls" (p. 275). Zacher reads the interactions between Christina and social spaces as a type of dialectic—she is both shaped by these spaces and uses them to shape herself. In contrast to the accounts in Wortham, who emphasizes the social construction of a stable identity position, Zacher proposes that children attend to power dynamics and consciously use social spaces to negotiate their life situations and provide proof for their flexible identity claims (cf. Hull, Zacher, & Hibbert, 2009).

Wortham (2004, 2008), Erstad et al. (2009), and Zacher (2009) make evident the great complexity of resources used in identity and learning processes, and, reflexively, how resources and processes we fix on indicate as much about our own (developing) methods as they do about the social. Interactions and narratives, for instance, are not simply key resources for mobilizing identity and learning in the naked world, but are made to be so by researchers. What "moves" in these cases is a multitude of potential resources, practices or actors, but also of course researchers, who collect data associated with specific space–time assumptions (e.g., the classroom interaction or the interview) and move and organize that data in particular space–time configurations. For example, longitudinal analyses may be said to have already addressed significant problems around learning across time, but are often heavily cloaked in a particular version of developmentalism that overwrites lived spaces and times with its own spatiotemporal narrative. Hence, a key challenge in researching mobilities involves a critical reassessment of the space–time shape and assumptions of research methods, assumptions, and modes of analysis.

An obvious methodological problem for trajectories work, as it strives to disrupt accounts that focus on single events to record evidence of learning and/or identity production, is how to operationalize the study of youth across events and contexts. Lemke (2000), among others, considers how historical and contemporary methods of research very often index what is reachable by a single researcher (in place and time), and how it may well "take a village" to study a village (p. 275), or ecological system of learning. An additional research problem, perhaps not nearly so evident, is how to understand time itself. In querying learning "across time," what understanding of time do we bring to the table? "Time" may appear to be an immutable construct, or one might even argue that we must naturalize our assumptions about time in order to move on with the real work concerning evidence and equity for learning. Yet time, as it is lived and experienced socially and culturally, is constructed in specific and diverse ways; time is "made" rather than simply given in advance and filled up (Dubinskas, 1988). Time as "kairos," or our experience of time, is markedly different than time as "chronos," or clock and calendar time. And yet clock and calendar time—whether truncated at the event or extended and divided up into units at greater "scale"—is what orders and structures research and guides our notions of "development."

To a certain extent, Lemke's (2000) work on timescales, highly influential in sociocultural theory (including in Wortham's 2006 and 2008 studies), upholds conceptions of timescales and their necessary constraints. This perspective on temporality builds its case from timescale hierarchies in complex systems theories and the "adiabatic principle" from physics, which describes why very fast and much slower processes cannot interact efficiently with one another. Although it seems worth raising critical questions on the degree of suitability of these biological and physical processes and rules as metaphors for social system analysis, we presently follow Lemke's own thinking concerning a remarkable characteristic of time in social systems. One of Lemke's (2000) key points is that, in human activity, processes from one "time scale" routinely interact with processes from a completely different "time scale." Social time, in other words, routinely

breaks rules from biological time (e.g., the adiabatic principle). In particular, through "semiotically mediated heterochrony" (p. 279), long timescale processes are brought to bear on and interact with processes in very short timescales, which Lemke notes as "the basis for human social interaction across timescales."

A textbook in a classroom is a clear example of heterochrony, as the years-long process of writing and publishing the textbook (and perhaps, for the teacher, of using it) are brought into the student's lesson-long interaction with it. Lemke associates his concern for heterochrony with Star and Griesemer's (1989) concept of the "boundary object" from science studies—objects that circulate through networks and serve roles of coordinating different institutions, social spaces, fields of study, or projects. One can read Lemke (2000) as signaling how temporalities (including time scales) do not merely exist in the world, but are rather semiotically performed, made significant, and coordinated. Such is evident, for instance, in Erstad et al.'s (2009) concern with narratives and their uses across situations that compose a life. In such a reading, trajectories are not merely wooden movements forward through time, where temporal separations are linked through some linear social process; they also describe the social semiotics of making particular forms of time visible and relevant (e.g., this class period, this textbook history, the presence of African American children in this school), building (or breaking) connective relationships between forms of time.

A second critical point concerning Lemke (2000), and trajectory work following how particular learners develop across time, concerns the relative emphasis on time over space. In the case of Lemke's (2000) work, although he eschews *some* spatial perspectives in his movements across timescales, what he primarily rejects is spatiality as static slices of the social, including "lines of connectivity," "horizontal layers," and "flat views" of human interactions that travel only to very local interactions, where immediate human scales of activity are most visible (p. 274). In brief, what is rejected are a-temporal perspectives on space. This type of critique—essentially the separation of space from time, resulting in static spatiality—is often also found within contemporary theories of social space (e.g., Lefebvre, 1991; Massey, 2005; Soja, 1989; Thrift & Dewsbury, 2000), and is the central reason why many theorists coin and prefer combined terms (i.e., "space–time," "time–space," "social space"). Turning this critique the other way around, we might consider the relative absence of dynamic simultaneity and moving distributions in the trajectories work. The trajectory itself creates its own thin slice, not across space, but through multiple spaces, dropping coeval spatial extension and spatial plurality to the cutting room floor. We might consider how spatial–social learning and identity networks interact with temporal–individual trajectories or pathways, toward a richer interpretation of spatiotemporal mobility. We turn next to some key formulations of learning networks.

New Directions for Learning Networks in Educational Research

Along with newly developing conceptions of place and the formulation of learning trajectories across space and time, educational research is beginning to open up new

conceptions of networks for learning. Such networks for learning may be accompanied by the rise of new technical networks (e.g., the Internet), but the idea of dynamic conception of "networking" cannot be replaced by the static human or technical map of distributions. Hence, following Latour (1999), this section could perhaps be more productively titled "New Directions in Learning Networking." Presently, we discuss networking as a mode of conceiving social spaces dynamically and relationally, where objects of all variety are moving and undergoing transformation. After considering networking in educational research, we return to a three-part review of place, trajectory, and network in studies of children's learning-relevant activity outside of school.

The spatiotemporal notion of networking within actor network theory (ANT; Callon, 1986; Latour, 1987, 1999, 2005; Law, 1994) has many dimensions, and is not a unified theory. Presently, we will consider some of these dimensions in the development and use of ANT for considerations of evidence and equity in educational research. Although ANT is not the only theoretical approach to studying networks for learning, it is a highly promising and emerging body of work that seems especially suited for considering mobilities of various kinds, for reconceiving of learning "environment," for challenging current perspectives on agency as a quality unique to individual humans, for considering how power is enacted through particular network formations and flows, and for challenging current perspectives on the relations between humans, tools, and signs.

However, one of the difficult problems with ANT is that it directly offers little on the analysis of learning or change of individuals. It is not a theory or set of orientations "designed" to understand learning. Scientists, who feature prominently in the work as individuals, are generally treated as givens in ANT rather than as actively produced or transformed (critiqued by Nespor, 1994, p. 15). Thus, although this problem and others make ANT a novel and potentially productive approach for rethinking access to learning, learning–identity relations, and other aforementioned problems and issues, the relationship of ANT to problems of learning is an indirect and uncertain one. The task of translating this "theory of translation" (Latour, 1996b) for productive use in conceiving of evidence for learning or problems of equity is indeed promising, but still only emerging.

ANT has introduced a wide range of constructs for thinking about networking, most of which have only begun to be deployed in education research. A recent analysis (Stevens, O'Connor, Garrison, Jocuns, & Amos, 2008) that spans trajectory and network approaches to learning takes up an approach to movements and connections across time and space that is characteristic of ANT and operationalizes the construct of "obligatory passage points" (Latour, 1987)—officially designed gateways through which one must pass to be recognized (in this case) as a particular kind of person. Using longitudinal data and focusing on engineering education, the researchers create "person centered ethnographies" (Hollan & Wellencamp, 1993) of students who become (or do not become) engineers across 4 years of undergraduate education. Although it is somewhat common to associate knowledge (here, "accountable disciplinary knowledge" or ADK) with development of identity work in studies of

disciplinary learning, Stevens et al. (2008) bring "navigating" in as a critical third relational construct. As an illustration of what Stevens et al. intend by "navigation," they discuss among other cases that of "Simon," who did not do well enough on early college coursework to be admitted to the engineering program at "Large Public University." From the perspective of disciplinary knowledge and institutional requirements, Simon's trajectory toward engineering was doubtful. However, a professor father of a childhood friend, who was a frequent mentor in Simon's childhood learning experiences, wrote him a strong letter of recommendation that helped him secure a job in a mechanical stress testing facility. Simon's experiences in the testing facility—as an opening or form of navigation—were pivotal for his institutional acceptance into an engineering program, for later success in coursework, and importantly, for the development of his identity as an engineer (p. 362). In the last 2 years of his undergraduate degree, the "noncurricular" forms of learning that Simon had accrued through the testing facility began to become increasingly significant to his (classroom) disciplinary learning.

Obligatory passage points exemplify, in the analysis of networked approaches to learning, how new (and old) mobilities of learning are not distributed over nude and abstract landscapes, but rather over complex institutional and political spaces that predefine necessary routes and transitions for continual movement through them. Given these necessary mobility practices across powerful boundaries and through deep institutional grooves, one's "individual ability" or presumed lack thereof is a poor explanation for disciplinary success (Stevens et al., 2008, p. 364). To conceptualize navigation work from the perspective of the person, we might consider his or her unofficial strategies (e.g., Simon's letter of recommendation) and unofficial routes (his work in the testing facility; p. 361). Moreover, and an important contribution of this analysis as it formulates an account of learning and mobility, institutions show marked differences in the degree to which they provide "navigational flexibility" for students. Unsurprisingly, "Suburban Private University" provided more of such flexibility than did "Large Public University" or "Urban Private University" (p. 361). Stevens et al. (2008) suggest that navigational flexibility—as materially and discursively structured into the buildings, policies, and pathways of institutions, and also as practiced within the strategies of individuals—is deeply entwined with what we have come to associate with higher learning in the disciplines. Hence, issues of access and equity are fundamentally framed spatially in the study, and associated with both the built environment and the material and discursive navigation practices of individuals.

Whereas Latour (1996b) argues that the split between the political world and the material world is characteristic of the modern period, in ANT the work of the material, technical world of the network is brought to the fore and given its due—the image of the world becomes one in which technologies are active agents, recruiting and "enrolling" humans (Latour, 1996a). A priori distinctions between humans and nonhumans are not made, indexing a tenet of ANT known as "generalized symmetry" (Callon, 1986; Pardoe, 2000). Rather than purifying categories, Latour (1993) calls for a "new anthropological matrix" in which notions such as "subject" and "agency" are replaced by "variable geometry entities" (p. 11). The extension of

agency across humans and nonhumans is central to Brandt and Clinton's (2002) theoretical critique of social practice theories of literacy, where the authors address, among other issues, the ways in which material objects "act," along with humans, to carry literacy into social spaces. The notion of agency distributed among humans and nonhuman actors is related to a larger body of work developing the idea of "sponsors" of literacy—"agents who enable or induce literacy and gain advantage by it in some way" (p. 349). The idea of sponsorship, further developed elsewhere for literacy studies (Brandt, 2001), could potentially be a rich lens through which to conceive of access to a broad range of social practice associated with schooling (e.g., mathematics), particularly were this distributed yet personalized account of agency expanded through an explicit analysis of sponsorship and mobility.

The Latourian "anthropological matrix" is highly relevant to inquiry into "environments" or spaces for learning and what they afford learning, as well as for understanding how learning within a disciplinary field involves ways of seeing, doing, and thinking and interacting that are coordinated and achieved by moving the "world" of that discipline across tools, representations, and persons. Nespor draws heavily on the ANT concept of "mobilization" as developed by Callon (1986), which refers to a particular form of movement or "translation" (Latour, 1987)—where two things that are not the same are taken as equivalent. In a common form of translation, a "spokesman" or representative (human or nonhuman) speaks for or represents an entity that has been recruited or "enrolled" in a relationship with it (Nespor, 1994, p. 15). Nespor compares how resources were mobilized in an undergraduate physics program at a public university with how resources were mobilized for learning management in a business program. In physics, Nespor traces chains of mobilization across sequences of activity and ways of seeing inside and outside of the classroom, including textbooks, which take physics from everyday life and represent it such that references to individual actors and their agency are stripped away, producing "context-independent universals" (p. 55) through books that are widely disseminated. Textbooks are then mobilized by physics professors, who reconstruct the textbook "facts" into a collection of brief narratives, restoring some of the context-dependence to the text, in their own fashion. A further chain is then student note-taking practices, which mobilize professor lectures as a means of interacting with the professor's performances, not merely as a way of recording them, but as a means of concurrently enacting them on paper (p. 69). Importantly, as students move along into higher level physics, the transformations from world and experience to page shift as well, as students increasingly learn to see things that they cannot observe in the everyday world.

Mobility studies inspired by ANT are directed toward describing and understanding the specific qualities of circulation among participants, including orientation, directionality, proximity, and others (Bingham & Thrift, 2000, p. 290). These relations are not merely of theoretical interest, but may also guide empirical work as researchers enrich ways of moving beyond claims that learning is distributed or mobilized and analyze how specific qualities of distributed networks afford and constrain learning opportunities, and for whom. For example, in a research study that analyzed

one youth's engagement across school contexts and contrasted it with his engagement in a massively multiplayer online game (Leander & Lovvorn, 2006), ANT was marshaled as a conceptual resource to contrast types of activity in schooling and gaming. One highly contrastive quality of networking in the two environments was difference of activity. In contrast to schooling, gaming rhythms for "Brian" were highly regular, and were partially structured by circulations of the game environment that required his ongoing engagement—movements that effectively inserted him as having a purpose for returning to play. A further contrast, which also indexes the specific relationships between networked entities as paramount, was that in the game, Brian was provided representations of his own activity that afforded him both local and more global (larger scale) perspectives on his own activity, in rapid circulation with one another. Yet, in his school practices Brian seemed often unaware of a perspective on his activity beyond the immediate and more-or-less pressing task.

Finally, beyond the reinterpretation of learning "environments" as learning networks, ANT is also being taken up to a limited degree in researching educational policy and its relation to practice (e.g., Clarke, 2002; Hamilton, 2001). Such approaches draw again on the generalized symmetry and mobilization of humans (e.g., policy authors, state officials, organizational heads) and objects (texts of all types, tests, devices). Hamilton (2001), for example, examined how the International Adult Literacy Survey (IALS) was turned into commonsense knowledge for a broad public, even while it left the history of that translation obscured. The author traces how the survey organized knowledge about literacy and the literate subject by translating its findings into a "simplified, received wisdom about what counts as literacy, who has and has not got it" (p. 192). This form of language translation, together with enrolling powerful institutional agents and achieving a very large number of enrolled texts, media sources, and human participants, permitted the IALS to achieve the status, functionally, as a social fact sheet about literacy.

The use of ANT in policy study, or policy to classroom-connection studies, provides one means of addressing matters of scale in other approaches, including discursive approaches to "place" discussed previously. The tendency in many multilevel or multiscale approaches, which use a more or less implicit embedded approach to contexts, e.g., Bronfenbrenner's (1979) "ecological model," is to place oneself in the center (or at the periphery) and to point in the other direction, abstracting the "global" or "local" or merely asserting their "influence" rather than empirically demonstrating such relations. Through an actor network, localities and globalities are achievements of network nodes, expansions and compressions, and translations, and are not given in advance as matters of social scale. Particularly in an era of increasing standardization, when policies are not only being increasingly mobilized but also taken up in multifarious ways, a studied examination of the chains of mobilization from policy to practice and back would seem a significant contribution with respect to opportunity to learn (e.g., how knowledge and being a knower become defined within subjects and disciplines) and with respect to evidence (e.g., how the complex effects of policy to practice and back are analyzed).

RESEARCHING MOBILITIES IN CHILDREN'S GEOGRAPHIES

This and the following section reach into bodies of literature that, for the most part, are beyond or outside mainstream education research. In many if not most cases, the interest of the researchers in these sections is not learning per se, but on the geographical, cultural, and social dimensions of children's lives. In the present section we review work from the developing area of "children's geographies," which, as presented here, is primarily comprised of human and cultural geographies of children. We have selected studies that are representative of key issues in this area of work, and have primarily focused on work with empirical data.

As opportunities for child engagement increase, with technological advancements and densifying and diversifying communities, so too does the gap between an adult's understanding of childhood and the actual day-to-day experience of being one. Matthews and Limb (1999) write,

> Assumptions are made by adults about what it means to be a child and therefore what environments they need. In so doing they fail to recognize that children differ from adults in terms of their "ways of seeing." What goes on during the day of an average young person is different in rhythm, scale and content from that of adults. Understanding of these differences needs to be rooted in the life worlds of children. (p. 66)

Therefore, stepping outside the educational literature and looking primarily at studies that describe the everyday lives of children should be a priority for practitioners and researchers wanting to educate learners in a culturally relevant and responsive way.

"Place" in Children's Geographies

We first engage with the idea of children's everyday lives by examining the changing nature of places of learning. Treated as a nexus of social, political, institutional, and cultural flows, places serve as methodologically significant nodes of analysis. Place may be defined as ". . . a space which people in a given locality understand as having a particular history and as arousing emotion identifications, and which is associated with particular groups and activities" (Watt & Stenson, 1998, pp. 252–253). In the following section, human and children's geographers locate their vision in outdoor, indoor, liminal, adult-controlled, commercialized, and coproduced places that shed light on and raise questions for children's learning and identity formation.

Indoor and Outdoor Spaces

Using methodologies that place the childhood experience and their construction of reality front and center (Holloway & Valentine, 2000), studies from children's geographies demonstrate that the childhood experience of and in space has changed dramatically between generations. The first change in absolute space, or how children from two generations experience their built/material environments, is the shift from spending leisure time outdoors to indoor play. To understand this phenomenon, an intergenerational approach is necessary (Karsten, 2005).

Through the comparison of oral histories of parents to the mobility patterns of their children, the radical shift from time spent outdoors to time spent indoors for today's children is apparent (Karsten, 2005; Pooley, Turnbull, & Adams, 2005). Research in Amsterdam has shown that children of the 1950s through the 1960s enjoyed extensive outdoor playtime without a lot of adult supervision. This freedom of movement was demonstrated in the journey to school and youth patronizing local shops. Furthermore, children were urged to play outside due to a lack of indoor space for urban families. Regardless of neighborhood, age, or class, leisure time meant playing out-of-doors, in streets, yards, and sometimes parks (Karsten, 2005). For children between the ages of 8 and 13 years in a New York City working-class neighborhood in the 1950s, 42 different sites were reported as places visited independent of adults. Adjacent woods, caves, the movie theater, and the park were local hot spots for children to enjoy without their parents (Gaster, 1991).

But as the years progressed, and the urban society and environment changed, so too did the ways in which children used time and space after school. Whereas in the 1950s when neighborhood streets were filled with playing children, many streetscapes of today allocate more land use to parking, have more traffic, and are void of youth. Gaster (1991) found that children of today's generation in one New York City housing development have fewer community settings to visit because of changes in the built environment and increasing restrictions placed on them by parents. Rather than roaming around neighboring environs, such as caves and parks, children spent almost all of their free time on the grounds of their housing development. This finding is consistent with Valentine and McKendrick's (1997) analysis of data collected from parents who have children between 8 and 11 years old in Northwest England. These authors write,

> The children who are most restricted, both in terms of spatial range and the activities they have the opportunity to pursue, are those who live in high-rise apartments. Unlike children living at ground level, children who live several storeys up are a long way from the "street" which means that when on the street they are a long way from parental surveillance. (p. 222)

So as our communities urbanize with more offices, stores, apartment complexes, and parking garages, children's outdoor play space diminishes (Aitken, 1994; C. Katz, 1994). But if children are not outside, what are they doing indoors, and how do these spaces of activity provide opportunities to learn?

Street as Place and Home

Another research area pertinent to new understandings of place in children's geography involves studies of the street as place. Studies of streetscapes elucidate how particular outdoor spaces continue to be adopted and transformed by youth as significant places of learning and identity formation. Many of these urban streetscapes have "liminal place" qualities that make them exceptional sites of research for people on the threshold between childhood and adulthood.

Describing the importance of streets to Amsterdam children from the 1950s and 1960s, Karsten (2005) writes,

> Children used the outdoor space of the street for many different activities, and urban public space was regularly appropriated for their own games. They built tents and even huts on the pavements and defended these against intruders of all ages. Playing in the street with few toys or other means generally demanded a high level of creativity. (p. 281)

Adult expectations have changed from the 1950s and 1960s—children should be off the streets, indoors. But while it may not be as socially acceptable, teenagers continue to "post-up" or hang-out at particular spots on street corners or sidewalks. The practice is more common among working-class youth living in densely urban areas. In their study of working-class, White adolescents living in areas of high unemployment and crime in the United Kingdom, Matthews, Limb, and Taylor (2000) describe teenagers using streetscapes to meet-up with friends, to avoid judging adult glances, and to create deeply personal spaces of identity. These youth find safety and solidarity in the intermediary space of the street that is neither public nor private. Matthews et al. write, "Streets comprised (semi) autonomous space or the 'stage' where young people were able to play out their social life, largely unfettered by adults" (p. 76). In Table 1, Matthews (2003) gives a sample of what adolescents in an impoverished Scottish community actually report doing on the street (p. 105).

This table shows how participation in informal sports on the street remains frequent throughout adolescence. Looking at the "hang-out" and "get away from it" categories simultaneously, one can see that as children get older, streetscapes primarily become a gathering place where teens can be with peers and away from adults and the pressures they represent. Reporting that "I'm doing nothing" becomes more acceptable with age, whereas reporting that "I'm just playing" becomes much less so.

In her study of "risk and risk anxiety . . . and its consequences for children's everyday lives" in Scotland, Harden (2000, p. 45) calls the familiar boundary of street space, where children are close to home and still have access to friends and community, the "local sphere." Although not inside the home, children tend to perceive the local sphere as a safe haven. To one teenager named Anthony, in Seyer-Ochi's (2006) study of the Fillmore in Los Angeles, one street corner is the cornerstone to his understanding of community, neighborhood, identity, and social life. This realization becomes painfully obvious to the young man when the street corner was "renovated" because of crime. Here on the street, the intersections of politics, economics, racism, and culture are not as easily ignored as they can be inside the home.

But what can the everyday experiences of those children who call the streets their home tell us about the experience of childhood? Children's geographers explicate the need for all youth to identify with and in place through studies of street children. These youth, who have fled abusive relationships with adults, have been nefariously misunderstood, or have suffered familial economic hardship in a changing global economy (Beazley, 2000), live in the interstitial space of streets at all times, trying to

TABLE 1
Most Popular Activities Carried Out on the Street by Age Group

Activity	Percentage (Frequency)			
	9–10 Years Old	11–12 Years Old	13–14 Years Old	15–16 Years Old
Informal sport	31 (8)	29 (8)	27 (12)	21 (9)
Just play	23 (6)	21 (6)	7 (3)	1 (1)
Meet/hang about with friends	19 (5)	25 (7)	30 (13)	38 (16)
"Get away from it"	—	7 (2)	11 (5)	24 (10)
Do nothing	8 (2)	7 (2)	18 (8)	12 (4)
Other activities	19 (5)	11 (3)	7 (3)	4 (2)

carve out particular niches to call their own. In this way, street children could epitomize what it means to be modern, surviving in spaces that are constantly destroyed, then renewed, revitalized, then updated (Ruddick, 1998). For homeless youth in Uganda, Van Blerk (2005) illustrates how episodic mobility and nomadic mobility are fundamentally different, afford different possibilities for producing identities, and can be understood by studying the time frames and patterns through which youth access multiple spaces and places. Van Blerk emphasizes that the proliferation of technology and place exponentially increases the mobility for some children while simultaneously restricts it for others. This finding is complementary to Young's (2003) study of full-time street children in Kampala, Uganda. She found that socially and spatially marginalized youth claim "untouchable" spaces—those areas that are too rancid, detestable, or isolated for adults. However, laying claim to and keeping rooftop, underground, or trash-ridden spaces comes with its share of negotiations with adult street-dwellers. She writes,

> Their acceptance . . . is based on them renouncing their subcultural behaviours and work in harmony with society to be allowed to engage in desired activity. In other cases they are driven by a money incentive to behave according to the social rules that govern their working activity. (p. 624)

Regardless of the motive, street children build connections throughout their local sphere for survival.

Adults and Place-Shaping Power, Supervision, Fear

Yet another area of research relevant to a new conceptualization of place in children's geography is studies of how adult authority and fear powerfully shape and control children's spaces. Studies of place-shaping power show how the movement from outdoor to indoor spaces described previously is further complicated by how "public" spaces are becoming increasingly adult-controlled and supervised, raising

tensions between older and younger generations. Those adolescents who take to the streets by choice or out of necessity experience the most intense version of marginalization as they are constantly under the watchful eye of disapproving adults, vying for space that others feel they do not deserve. Exclusion from public spaces may prove extraordinarily challenging for street children; however, some still manage to find acceptance and make a new family, as Beazley (2000) found in her observations and interviews of street children in Java, Indonesia.

The punk squatters in Hollywood during the mid-1970s and early 1980s, for instance, faced intense resistance to their practice of inhabiting condemned buildings. As the group gained a reputation for being violent, marginalized spaces in which they lived, such as abandoned apartments and warehouses, were demolished. Frank, a former punk and participant of Ruddick's (1998) study, is quoted, "We're talking about the erosion of free space. You know, not just open space in the sense of, 'oh yeah, nice parks.' We're talking about space with any kind of latitude for independent action" (p. 350). Eventually, the mainstream, adult-led dissolution of space resulted in the decimation of the punk scene, but not before these adolescents changed the meaning and identity of "homeless youth" in Los Angeles. According to Ruddick, social workers and other professionals working with street kids had to "change their understanding and mode of treatment of youth in this act of suturing the positive identities that the youth chose for themselves and the images they (the service providers) had of runaways in a new space within Hollywood" (p. 359). At least in this example from northwest Los Angeles, adults were forced to examine and understand the everyday reality of youth in order to live harmoniously and provide a service in a relevant way.

Today, however, many adults characterize youth seen on the street as loiterers and "up-to-no-good." Valentine (1996) sketches how an "angel"/"devil" dichotomy shapes conceptions of children in space, such that the concept of danger runs parallel to the concept of dangerous children. Adolescents' time in public spaces is limited and often reprimanded. In one specific case, two adolescent girls in Wales were ticketed by police officers for drawing with chalk on a neighborhood sidewalk. The police claimed it was "graffiti" (Gill, 2007). Skelton (2000) ethnographically traced how deprived adolescent girls in a depressed urban area in the Rhondda Valleys in South Wales were frequently threatened and chased off by adults.

Even though spending time on the streets continues to be snubbed by adults, children continue to resist being compressed into indoor spaces. Rather than remaining idle or under constant supervision of adults, children "resist, oppose and find gaps in adult restrictions," Valentine (1997) writes. Streets of today serve as an intermediary space between private and public realms, especially neighborhood streets. Perhaps more important, streets act as a zone of development and transition, whereupon children gradually move away from home and the comfortable confines of family life to a more "adult" existence of peers and the tensions and pressures of the outside world (Matthews, 2003).

Institutional and Commercial Sponsors of Learning Places

Research from children's geography regarding the institutionalization and commercialization of learning places enhances our understanding of the current state of children's places. Examining how new urban developments affect children in the Netherlands, Karsten (2002) argues that along with child safety, a focus on personal achievement and changing ideas about motherhood is a dominant discourse that is changing the spatialization of children in the city. But the shift has occurred differently for children from disparate socioeconomic backgrounds. Although on average, children spend much more time indoors than their parents' generation, some youth experience the daily routine under constant adult supervision. Others have more autonomy, either indoors or outdoors. These distinctive experiences are delineated across social and economic class (Karsten, 2005; Lareau, 2003).

Children from poor or working-class families have more opportunities for outdoor and autonomous play because parents have fewer resources (money and time) to provide youth with organized activities (Valentine & McKendrick, 1997). In her study with Turkish/Moroccan, Surinamese/Antillean, and Dutch-born children living in Amsterdam, Karsten (1998) found that a child's class (i.e., working class, middle class) is a better predictor of how she spends her leisure time than her ethnicity. Although children from working-class or poor families may have more opportunities to be independently out of doors, the discussion above has shown that outdoor spaces are being eliminated.

Children from middle- and upper-class families have alternative places within which to spend time—institutionalized spaces. Middle- and upper-class families in the United States dedicate a lot of time and money to the "cultivation" of their children—providing opportunities that will perhaps look good on a resume (Lareau, 2003). In a cross-cultural study of children from Kenya, Brazil, and the United States, Tudge et al. (2006) discovered that, regardless of geographic location, "children from middle-class families were more likely than their working-class peers to be involved in academic lessons and were more likely to play with academic objects" (pp. 1462-1463). Rather than informally playing outdoors, these children experience "leisure time," or after school time, engaged in a formal activity supervised by an adult (Lareau, 2003), such as a piano lesson, soccer practice, or chess club. In this way, the daily life of middle- and upper-class children has been insularized; increasing money flows and markets for afterschool "child care" in this capitalist market have minimized the amount of outdoor space available to youth. Many of today's children spend their leisure time within walls, fences, or behind hedges, creating a continuum of traveling from one "contained" space to the next (Zeiher, 2003). Fuller, Bridges, and Pai (2007) found that even in United States preschool classrooms, where the curriculum may be "emergent," these government-sanctioned institutions are standardizing the ways in which very young people from culturally diverse backgrounds learn and develop. Pre-K teachers and administrators pressure parents to prepare their children for school in a very particular way.

Analyzing adult attitudes toward children and childhood in the United Kingdom, Gill (2007) argues that adult supervision and contestation over space has pushed adolescents into the house to fully explore virtual space—begging the question of what children without computers in the home do with their free time. In her study involving a questionnaire of 1,600 children and young people in the United Kingdom and fewer in-depth interviews, McNamee (1998) found that the containment of both genders inside the home (not just the girls, anymore) has created a more competitive atmosphere over resources, like the remote and computer games. "Young men are controlling and policing their sisters' access to computer and video games in the expression of their masculine identity" (p. 204). Some of these contained "play" spaces are even commercialized, connected to restaurants, malls, and shopping centers. Their use requires money, necessitating a parent that patronizes the establishment (McKendrick, Bradford, & Fielder, 2000).

However, the play spaces designed and built for children do not necessarily match what children actually want in a play environment. Studies in the United Kingdom and the United States found that children between 8 and 13 years old prefer the outdoors, or open spaces, utility sites, and home spaces for play more than any others (Moore, 1976). Therefore, perhaps parental desires are considered more than those of children when designing commercialized play centers. Busy, working mothers and fathers can use these facilities as a way to relax, have a drink at the adjoining bar, and let someone else (an employee) watch their children. McKendrick et al. (2000) write, "These centres serve a useful function for adults, undoubtedly centres pander to parents' often irrational concerns for children's safety" (p. 113). Insular spaces, such as indoor play grounds, fenced yards, and hedged-in soccer fields, are characteristically supervised by an adult, the ongoing activity is organized, and rules are adult-negotiated and enforced.

So with few opportunities to negotiate time and space independently, these children are missing out on a developmental experience had by their parents, and some children from poor and working-class families (Valentine & McKendrick, 1997). Middle class children's lack of independence and participation in shaping their daily time schedule brings up the question of whether some of today's youth experience a lack of agency in decisions made about the spaces within which they function (Zeiher, 2003). Having the opportunity to call a particular chosen space a "place" may be absent for some children.

Coproduction of Social, Critical, and Physical Dimensions of Learning Places

Another research area important to new understandings of place in children's geography are studies of places as social, critical, and physical coproductions of learning. These studies of places as sites of coproduction illuminate how the commercialization of spaces described earlier is complicated by how children view and categorize these places as either spaces of exclusion, marginalization, structure, etc. Therefore, asking children how they would envision and change the places through which they

travel and participate, such as their own school grounds, allows learners to engage in the spatial arrangement of their own lives. Rather than living, working, and playing in a space configured by others, learners engage with their surroundings in a way that is empowered with possibility and agency. In their study of the ethnically and culturally diverse suburbs of Adelaide, South Australia, Comber, Nixon, Ashmore, Loo, and Cook (2006) write, "Many school projects strip out the richness of everyday life and the complexity of getting things done in the real world" (p. 243). In this "urban renewal" activity, children possess the authority and power to map their own spaces. Harvey (1996) describes mapping when he writes,

> Mapping is a discursive activity that incorporates power. The power to map the world in one way rather than another is a crucial tool in political struggles. Power struggles over mapping . . . are fundamental moments in the production of discourses. (pp. 111–112)

A sense of agency and appropriation over lived spaces can be the result of children drawing maps of envisioned or re-imagined (Comber et al., 2006) school grounds and communities. To Harvey (1996), they become active participants and creators of the discourse used in that space.

As many children grow up, they watch their neighborhoods, streets, and houses deteriorate. These deteriorating spaces only add to feelings of exclusion for children in that facilities once appropriate for use are now in ruins (Morrow, 2003). In Detroit, Michigan, for example, Breitbart (1998) discovered just how affected young people are by their surroundings. She writes,

> Young people who live in declining parts of the city are profoundly aware of the influence that their local environments exert. They can literally see and feel the constraints that dangerous and/or inadequately provisioned neighborhoods place upon them, and they can appreciate the opportunities that safe places, with ample resources provide. . . . These spaces send messages to young people about how an external world values or fails to value the quality of their lives. (p. 308)

In this project, adolescent volunteers who engaged in a community revisioning initiative made astute observations of the bleak urban conditions, and set out on a course to change them. By creating new public art installations, usually in the form of gardens or murals, youth actively changed their community, participated in intergenerational projects, and came to a better understanding of the political, social, and economic forces that make cities dynamic, for better or worse (Breitbart, 1998). Presumably, gaining an understanding about where you are in the world promotes realizations of where others are in relation. Targeting the spatial aspect of learning is thus an important way of promoting democratic values and citizenship.

"Trajectories" Across Children's Geographies

Historically, the ways in which children have traveled between places have been understudied and undertheorized. Even today, little is known about the salient qualities of one's pathway from place to place, or what happens in those transitional

periods at all. However, if we compare the mobility of children from previous generations to that of present-day children, the contrast between the two prompts a reconceptualization of "learning on the move." The lack of self-directed mobility and the immense amount of time children spend in transit problematizes the notion of rides in automobiles as mundane, unthinking routines. Research from the United Kingdom has shown that there has been a substantial increase in the proportion of children riding in a car to school and a decrease in children arriving to school on foot with an adult (Pooley et al., 2005). Hillman, Adams, and Whitelegg's (1990) study, in response to an increase in car use patterns and child fatalities in traffic accidents in Britain, correlated a significant decrease in children's independent mobility with an increase in traffic congestion. In 1971, 80% of 7- and 8-year-old children went to school on their own, by 1990 only 9% were making the journey unaccompanied, with more than four times as many being driven than 20 years earlier. The study, based on an historical analysis of survey data in the United Kingdom and Germany, illustrated how children's discretionary space has undergone an inversion in the past 40 years, from independent mobility in outside spaces to sequestered play inside homes or other adult-monitored spaces. Movements between these places are determined by adults. Adult accounts of their mobility as children contrast starkly to today's image of "contained" children. One particularly idyllic report highlights the incredible independence of a 4-year-old boy as retold by Ward (1978):

> Not as a chore, but as an eagerly desired pleasure, I was fairly often entrusted with the task of buying fish and bringing it home alone. This involved the following: walking to the station in five to ten minutes; buying a ticket; watching train with coal-burning steam locomotive pull in; boarding train; riding across long bridge over shallows separating small-boat harbor (on the right) from ship's harbor (on the left), including small naval base with torpedo boats; continuing through a tunnel; leaving train terminal, sometimes dawdling to look at railroad equipment, walking by and sometimes entering fisheries museum; passing central town park where military band played . . . selection of fish; haggling about price; purchase and return home. (pp. 10–11)

Compared with this account of a fish-buying errand, there are very few everyday activities of today's children that demonstrate so much responsibility, independent mobility, and agency within our own communities (Ward, 1978).

Constricted Mobilities of Today's Children

Research concerning constricted mobilities of today's children from children's geography elucidates the changing nature and importance of trajectory. Today, more family time and resources in the United States suburbs are dedicated to driving children around the adjacent community and beyond (Lareau, 2003). Nespor (1997) demonstrates that some children in suburban/urban environments in the United States recount their daily travel trajectories around the corporate, commercialized places they pass, such as grocery stores, mega-churches, and fast food chains. These establishments become the easily identifiable landmarks of modern daily life. Such mobility patterns draw a clear picture of where and what resources children notice,

recognize, and access within a community. Pia Christensen (2003) describes an 11-year-old girl's experience of her community in Copenhagen:

> [Mie] knew her local neighborhood only through the particular routes she used. She knew the route from home to school and also the route from her house to the local cinema but she did not know the route from school to the cinema. This became an issue for her when a children's film club started up at the cinema. (p. 22)

For Mie, her unique and constricted trajectory through space and time both illuminated certain parts and pathways of her community and hid others.

Although today's middle-class youth travel over greater physical distances, their degree of self-directed mobility appears to be much smaller than the prior generation. When a child is ferried around town in the backseat of a car, from one organized activity to another, there is little environmental understanding or community participation required (Valentine & McKendrick, 1997). Whereas independent mobility affords collective interactions with neighborhood peers, shopkeepers, and other community stakeholders (Christensen, 2003), rides in the backseat of a car usually do not. Older adolescents who would be more likely to travel around without an adult present, on foot, on bikes, or in cars, are having their mobility restricted by policymakers. Breitbart (1998) writes, "Middle class suburbs [in the United States] with exceedingly low crime rates now join cities in the use of legal time curbs on the free access of citizens below the age of 18 to the out-of-doors. Indeed, President Clinton has come out publicly in support of curfews for *all* cities and towns in the U.S." (p. 307). Therefore, children's "home ranges" are not just restricted by overprotective and fearful parents. Structural limitations, laws, and urban plans are built into the terrain over which children travel.

Obviously, children's mobility increases with age, but is also highly dependent on gender. In a rural Vermont community, Hart (1977) found that boys enjoy an increased range of movement away from the home as they mature, but girls are kept close to the hearth. Whereas boys are encouraged to exercise their independence out in "the wild," girls are taught domestic skills in the confines of the house. This disparity may be even greater in rural landscapes where adolescent girls struggle to find any space outside their own homes with which to identify—to call a "place" (Dunkley, 2004). In urban and suburban areas, especially in the United States and Europe, adolescent girls have enclosed malls, town centers, and restaurants that provide more security than the open streets where unwanted male attention is feared (Watt & Stenson, 1998). These establishments become places of socialization and identity formation for young girls. But by the time their children are 8 years old, parents stipulate gender-specific rules regarding locations that can be visited, mode of transportation, and time allowances, limiting the diversity of places in which girls can associate. Additionally, in his study of Coventry schoolchildren in the United Kingdom, Matthews (1987) found that a more restricted "home range" is detrimental to girls' understanding of spatial tasks such as mapping or making graphical representations.

Track Data Studies

Another research area relevant to new understandings of changing trajectories in children's geography is studies that use new technologies such as geographic information systems (GIS) and global positioning system (GPS) to study the everyday movements and activities of children. These studies, using geospatially referenced data, further illuminate how the increasingly restricted mobilities of today's children exhibit structural constraints that directly affect opportunities for elective learning. After strapping GPS devices to the wrists of schoolchildren in Cheshunt in Hertfordshire in the United Kingdom, and accelerometers to their waists, Mackett, Gong, Kitazawa, and Paskins (2007) reify the finding that just having an adult present changes the nature of a child's mobility. They write,

> [children] tend to walk faster, more energetically and straighter when with an adult. Without an adult they tend to "potter about" in a much more exploratory way. Whilst speed has its benefits, there is a need for children to explore the environment at their own pace, gaining experience and learning about the world. (p. 15)

Boys, especially, seem to be fond of meandering around the open spaces they might encounter on the journey between home and school.

Another GPS track data study in the southern United States (Headrick Taylor, 2008) has shown that some upper middle-class adolescents have an expansive range of mobility that spans upward of 15 miles and through diverse communities in terms of race and income. However, in a time-density surface (where time-in-place rises on the *z*-axis above the surface of the map) created in GIS software, the analysis demonstrates that these adolescent participants do not spend any time at all in these "diverse" locations, but are instead just passing through. In this regard, one's home range or trajectory is divided into places with high or low relevance for elective learning.

Using GIS/GPS methods along with some form of time-diary to capture daily accounts of activities is participatory for children in that they are building their own biographical record. With children from an academically nonselective school in northern England, Walker et al. (2009) viewed track data together with the participant/producer to once again move the research perspective from the researcher to the child. Interviews about the track data and the accompanying photo-journals permitted children to generate their own categories of places. Comparing points in the track data that were *not* elaborated by accompanying photos also helped researchers to understand places in a child's daily round that are distasteful, scary, or even too mundane to take special notice.

Learning as Mobility

Researchers in human and children's geography and elsewhere have been using innovative methods to ascertain a person's learning and identification related to particular spaces throughout one's surroundings that explicate the changing nature of trajectory. Taking the importance of traveling between places very seriously, Laurier

et al. (2008) equip car dashboards with cameras to understand how the small interior of an automobile reconfigures discourse and relationships. The car is a "*translation and displacement* of the office or the domestic spaces which the drivers and passengers also shared" (p. 26). For parents and their children, especially, the car is a place of sharing and learning about one another, where the day's events are shared and time and attention can be largely undivided. Learning here, occurring throughout one's trajectory, is not at all trivial or mundane.

Another way of ascertaining nodes of salience for a learner is free recall maps, or having study participants draw maps of their communities. This task allows researchers to see what places along the complicated daily pathway are important and actively mediating environmental cognition (Hart, 1977). Free recall maps are also countertexts, or another version of the participant's biography, that clearly identify structures of salience. Places that are mapped, and therefore have relevance, are interpreted as spaces of deep engagement where some type of learning is taking place. Those places that are absent (but exist in "reality") have no relevance to the participant (Seyer-Ochi, 2006), and are therefore, not part of the cognitive map.

Lehrer, Jacobson, Kemeny, and Strom (1999) demonstrate that an everyday understanding of space can be used as the groundwork for mathematically thinking about coordinate systems, for example, but explicit facilitation by a pedagogue is necessary for children to "see" mathematical properties in our everyday surroundings (p. 79). However, children's everyday spatial awareness seems like an untapped and underutilized resource in the classroom. Could this be because of a disconnect between adults' and children's experience of space? Whereas one generation never "toured" World of Warcraft, or built complex environments in SIMs, the other generation spends countless leisure hours traveling through all kinds of virtual worlds. Therefore, how can educators "spatially connect" to the learners they teach? One place to start, perhaps, is to first understand today's teen experiences of space *outside* of school.

"Networks" Across Children's Geographies

How do embodied movements and technology fit together to make a sustainable network, and what role do these tools play in mediating where we go and how space is produced? The social studies of science have contributed research to a new understanding of space–time that elucidates the nature of maps as a kind of discursive technology that mediates human travel. Maps do not merely *show* us how people understand and reason about space. Just like any other piece of technology in the Latourian sense, maps are one example of an "immutable mobile," instantiating durability (Latour, 1991). Vertesi (2008) demonstrates how the London Tube map, with its iconic status, acts as "an essential visual technology that stands as an interface between the city and its user, presenting and structuring the points of access and possibilities for interaction within the urban space." Based on what the map shows as possible, in terms of routes, connections, and distance within a certain time constraint, exploration and an experience of space are produced. Although

mass-produced maps are not generally intended to do so, they oftentimes come to serve as a general representation of the city in the user's mind. Although facilitating wayfinding and route-planning are still seen as an important function of these graphical representations, scientists are now starting to recognize the cognitive influence of maps.

Lammes (2008) points out that mapping practices in the cyber/gaming world, one in which more and more people interact, are much more flexible and dependent on the user's needs at any given time.

> In *Age of Empires*, for example, the player is in a constant flux of moving through territory, which is translated into an expansion (filling-in) of the mini map. Conversely, one can click on the mini map to move to an area on the big screen. It is even possible to click on an explorer on the main screen, go back to the mini map, click on the area you want to send her or him to, and subsequently move her or him to that chosen spot on the main screen. Hence, mapping and touring entertain a highly dynamic relationship. The player indeed becomes a mapmaker, but this cannot be described as a straightforward depersonalized endeavor. It would be more precise to call the player a cartographer on tour. (p. 267)

In the virtual world, people have rich opportunities to make their own maps, both onscreen and mentally. New practices of virtual navigation and movement present challenges for human geographers studying trajectories and networks.

Social Network Studies

Another research area relevant to new understandings of network is studies of children's social networks. Sociology and psychology have contributed a massive body of empirical research on the role of parent social networks in either affording or constraining learning and development opportunities for children (e.g., Crockenberg, 1981; Homel, Burns, & Goodnow, 1987; Tietjen, 1985). These studies that find some way of measuring social cohesion, or the layout of a network, usually use a common instrument in which respondents are interviewed on the following concepts: "name generation" or asking for a list of people with whom the respondent comes in contact, "characteristics of network members and their relationships to respondents," "exchange content" or the type of interaction the named network member has with the respondent, and "intensity of relations" or how frequently a name is generated (Cochran & Niego, 2002, p. 128). Many of these studies, conducted all over the world, found that adults outside the home, but part of parents' social networks, provide children with access to more resources, more support, and differing perspectives than what is dominant in the home culture (Cochran & Niego, 2002).

Children are not merely accessing adult networks for support, however, but also create multi-tiered peer-to-peer networks, especially in places like school. Younnis (1994) asked children between the ages of 6 and 12 years to recount stories of being kind and unkind to a friend and/or peer. As is typical, the material focus of the stories changed as the children aged, but all children in this age range alluded to the notion of interdependence and past and future consequences of one's actions. In this way,

learning reciprocity is one way in which peer-to-peer networks socialize children. Younnis writes,

> Visiting a sick friend can be understood as part of a continuing series of actions in which the roles of being in need and being able to help were previously reversed and are potentially reversed in the unstated future. At any moment, circumstances might place one or the other friend in either role. What distinguishes friends from peers in general, therefore, is mutual obligation and interdependence, which develop through reciprocity. (p. 78)

Children, too, have a sophisticated sense of the importance of relationships with people. For psychologists studying young people, social networks are not just a way to learn culture and become socialized into a particular world, but networks reify the scientific claim that we are all social from the very beginning of our lives and need personal interaction on a deep level.

THE CHANGING VIRTUAL GEOGRAPHIES OF CHILDREN

In describing the way Hong Kong youth use ICQ, a popular chat and instant messaging (IM) software, Jones (2001) writes, "If you were to ask the question 'what are you doing' to most secondary or university students in Hong Kong when they are 'playing ICQ,' chances are the reply would be something like 'homework'." Jones goes on to explain that this would not be a deceptive answer. Rather, the Hong Kong youth in his study fully integrated their use of ICQ with other online and offline activities. While "playing ICQ," which could involve IM sessions with more than one person, they interacted in the offline world, chatting with siblings, parents, and friends. They also surfed the Internet, watched music videos online, played computer games, and emailed. One might ask not only what these youth are doing, but also *where* are they doing it? Although a young person may be physically located in an apartment in Hong Kong, sitting on the couch with a laptop on her lap, she may be virtually located in other cyberspaces: in a chat session with a friend next door, in an online computer game environment with others from across the city, or watching videos produced by youth from another country. Jones (2001) argues that these movements across virtual space are "really more like *navigation* than 'communication,' more like 'walking' than 'talking'." He also points out that "the interface [for their online communications] is not the screen; it's the world." Virtual mobilities, then, must be seen as movements across and through physical and virtual spaces made possible by Internet and other technologies (e.g., cell phones and video game systems).

We open this section of the chapter, our review of empirical studies of children's virtual geographies, with the above scene as a way of introducing the landscape of virtual geographies. What the scene makes clear is that young people who spend time on the Internet are living and learning and moving in and through places and in ways that were not possible only two decades ago. How do researchers come to understand these new mobilities (to gather evidence about them)? And what are the implications for equitable learning opportunities for students moving across the virtual landscape?

The scene of students "playing ICQ" in Hong Kong can also set the stage for the three-part framework of this section, wherein we consider studies that offer perspectives on place, trajectories, and networks. Consider the ways in which each of these perspectives might offer a distinct look at the student in her Hong Kong apartment. First, a focus on place in the Hong Kong scene might consider how particular locales—the chat room or the apartment—are constructed of and through a nexus of multiple relations (e.g., in the chat room, the various participants, the software and hardware that form ICQ technology, the positioning of the laptop on the lap, parents or siblings in the apartment looking into the chat room). Second, a focus on trajectory might consider this particular student's history of conversations online and offline with others throughout the days and weeks leading up to this afternoon or evening in the apartment. We might also think about the homework the student is doing as contributing to a trajectory of assignments and learning that has occurred over time and space. Third, a focus on network might consider the interconnectedness of this student's learning and homework production. Does she seek advice from friends online, go to Internet sites with helpful tips for a particular assignment posted by other students, or work collaboratively with others?

We move away from this scene as one example of the virtual geographies of children to a broader description of the virtual landscape and an explanation of our methodologies in considering studies for this section. Extensive reviews of the rise of Internet use from the early 1990s to the present in the United States (Tapscott, 1998; Warschauer & Matuchniak, 2010) and other countries (Haythornthwaite & Wellman, 2002; Thulin & Vilhelmson, 2005) show both rapid increases in Internet access, at home and in public and work settings, and nearly ubiquitous Internet use among youth in developed countries (Lenhart, Arafeh, Smith, & Macgill, 2008; Thulin & Vilhelmson, 2005). As for the developing world, "community centers and cybercafés are helping the Internet move from an elite preserve to a way in which ordinary people can do business and chat with friends, quickly and cheaply" (Haythornthwaite & Wellman, 2002, p. 7).

Now that the Internet is a part of the lives of so many young people across the globe, what do we know about how they travel across it? We follow from recent calls for research that take into account the everyday ways that youth use the Internet (e.g., Bennet, 2004; Bingham, Valentine, & Holloway, 1999; Haythornthwaite & Wellman, 2002; Hine, 2000; Ito et al., 2008; Leander, 2008; Leander & McKim, 2003; Thulin & Vilhelmson, 2005; Valentine, S. L. Holloway, & Bingham, 2000) and also adopt a geographical, spatial, and mobility frame in regards to studies of everyday Internet use (Hine, 2000; Jones, 2005; Leander & Lovvorn, 2006; Lemke, 2006) in reviewing empirical studies that investigate the virtual geographies of children and youth. We focus on empirical studies that consider the everyday travels of youth and children across virtual landscapes in the context of the rest of their lives. We eschew technological determinism for context, believing, with Skop and Adams (2009) that

the medium has no particular essence; instead, diverse Internet users invest multiple cyberspaces with varied meanings. Thus it is necessary to study the uses of the Internet in a careful, empirical fashion in order to make sense of the role this new medium plays in geographical processes of particular user groups. (Skop & Adams, 2009, p. 128; see also Holloway & Valentine, 2001; Valentine & Holloway, 2002)

We have not considered studies in which educators have made efforts to introduce new technologies into formal or informal pedagogical environments. Rather, our interest is in the ways that children and youth live and learn across the many virtual geographies available to them. In particular, we are interested in what is new, changed, or changing in regards to the ways that youth and children live and learn today, what evidence there is for these shifts, and how our understanding of inequalities and equalities are framed by changes in virtual geographies. Because they focus in detail on the context of everyday travels across virtual geographies, most of these studies are, at least in part, methodologically qualitative and ethnographic. Such research "looks down and discovers limitless internal complexity within, which is materially heterogeneous, specific, and sensuous" (Law, 2004, p. 13). The following section proceeds in three subsections; each subsection includes discussion of representative studies rather than a comprehensive consideration of all available studies.

"Place" in Virtual Geographies

Kitchin (1998) carefully considers the issues and arguments surrounding the spatial nature of cyberspace. It can be seen as transformative space, shifting space–time relations and creating new social spaces and places. But the nature of these transformations is debated. On one side, arguments exist for the compression of space–time such that cyberspace becomes spaceless and placeless, a nowhere and everywhere, where geographic and temporal boundaries no longer matter. Or, others argue that space and time maintain their significance: For example, Internet connections and bandwidth capabilities very much depend on one's place in the world, while using information from the Internet also depends largely on where one is bodily located (Kitchin, 1998).

It is also argued that space and time maintain significance as humans seek community connections in virtual space: "these [community] ties have transformed cyber*space* into cyber*places*, as people connect online with kindred spirits, engage in supportive and sociable relationships with them, and imbue their activity online with meaning, belonging and identity" (Wellman, 2001, p. 229). These arguments also frame thinking about inequalities and equalities perpetuated by or produced through cyberspace. It is either an equalizing and globalizing force, compressing inequities prevalent in the physical structures and allowing access to all children to learn; or, cyberspace excludes outsiders without technical savvy to participate, neglects those without access, and otherwise perpetuates existing barriers to equality (Hargreaves, 2002; Holloway, Valentine, & Bingham, 2000).

In considering virtual geographies from the perspective of "place," we take Massey's (2005) conception of places as formed in *negotiations* "within and between both human and nonhuman" (p. 140). Here, we consider empirical studies that report

on the construction of places created through particular negotiations of humans and nonhumans in online and offline spaces. As children and youth traverse virtual geographies, new places are constructed or reconstructed through negotiations in virtual and in physical spaces.

The construction of these places depends on the interactions and negotiations of both humans and machines across the physical and virtual world. To illustrate the way that virtual places are differently constructed depending on social negotiations around them, consider the placeness of cyberspace. In case studies of family Internet use (Facer, Furlong, Furlong, & Sutherland, 2001; Valentine & S. Holloway, 2001), the way cyberspace was constructed by parents and families as a particular kind of place had impacts for parents and children on traversals into and through the virtual, thereby affecting the learning opportunities afforded children and youth in cyberplaces. Parents who interpreted Internet sites such as chat rooms as places akin to the physical street, where there is a perceived danger of abduction by strangers and other safety concerns, heavily restricted children's unsupervised use of the Internet. Facer et al. (2001) found that families restricted access in varying ways (e.g., not allowing Internet access at all in the home, requiring parent-held passwords for access, only allowing access with supervision). These restrictions, all coming out of the construction of home and certain online places (e.g., chat rooms) as dangerous, have obvious effects on children's equitable access to learning opportunities online. But other parents, although still making this comparison of the physical street and the cyber street, saw Internet use as apart from the physical street and, therefore, more safe: "two sets of parents explain that they would rather that their children were indoors using the PC where they could see them than on the street where they did not know where they were or what they were doing" (Valentine & S. Holloway, 2001, p. 76). Other parents recognized the co-constitutive nature of places virtual and physical and believed that cyberplaces were no more or no less dangerous than physical places.

These alternative possibilities as conceptions of place-making in the virtual and physical world serve to introduce the next section of the review, which considers place as constructed through negotiations of humans and nonhumans. In the first part of this section, *physical* places were found to be in flux as a result of these negotiations between the virtual and physical. In the second part, the construction of *virtual* places is at play for children simultaneously constructing identities in the physical world.

Physical (Re)Constructions of Place for Online/Offline Lives

Holloway and Valentine (2001) drew on their research with 30 British families with children aged 11 to 16 years to examine physical changes in space because of the introduction of new technologies. They investigated households that represented a variety of home computing and Internet use arrangements, believing that the implications of introducing new technologies "emerge as people and objects come together in communities of practice and different households domesticate technologies in different ways (Wenger, 1987; Silverstone et al., 1992)" (p. 569).

Families materially structure the lived space differently when introducing technology into the home (Holloway & Valentine, 2001). These decisions are in part based on broader social processes including the family's socioeconomic status. Also important were the ways in which families viewed the social processes surrounding activities associated with the computer: Are computer users viewed as isolated or involved in larger social processes that connect to other family activities and structures? The answer to this question affected whether or not the computer would be placed in public or private space. Learning also played an important role in decisions about structuring the lived space as a particular kind of place. Children's educational needs were often placed ahead of all other types of computer use (e.g., adult use and children's recreational use) such that the nexus of relations surrounding the computer in the home create the location of the computer as a place for learning.

Like Holloway and Valentine (2001), Facer et al. (2001) found that

> a reconfiguring of domestic space can be seen in the arrangements that are made within families to incorporate these newer technologies, arrangements that both alter and draw upon the existing geography of the family space and indicate the functions constructed for this technology within the family system. (p. 17)

The material changes in home spaces differed depending on the families' visions of computer use—whether or not, for example, time on the computer should be spent in private or in public spaces in the home. The researchers argue that these differing spatial formations "impact on the ways in which young people negotiate the relationship between their physical and 'virtual' existences" (p. 18). "Screen space" (Jones, 2005) was another site of material change brought about by the domestic settings and relationship structures: Individual computer users would "inscribe their identities and ownership by leaving traces of themselves and eradicating traces of others' occupation" (Facer et al., 2001, p. 20)—e.g., by changing settings on the computer: altering the desktop layout to include bright colors, relocating menu bars, or changing the screensaver. The construction of home and computer as places was, then, continually in flux.

Of particular import for children's learning in place afforded by new technologies, Facer, Furlong, Furlong, and Sutherland (2003) focused a section of their monograph devoted to understanding home computer use in the United Kingdom on "how and what young people are learning when they use computers at home" (p. 185). Home, here, was constructed as a learning place by the intersections of resources that support learning. Young people participated in "knowledge-creating communities" made up of members of their families and groups of friends that, together, co-constructed knowledge at the site of the home computer by sharing expertise gained in the home and elsewhere (e.g., at school or from friends or relatives outside the home). Other resources that youth drew on while learning in the home were texts (both digital and paper-based) and a method of "creatively copying" resources that further enabled learning (e.g., copying a basic program from a book to get started with computer programming, copying clipart and transforming the image, or copying templates for Web page design).

Like the home, the classroom was found to be a place constructed through negotiations among the physical, virtual, and social. Valentine, S. Holloway, and Bingham (2002) considered whether or not students had access to technology that was materially available in the classroom. In their analysis, they followed Latour (1996b) and Law (1994) in arguing that the "technical and the social codevelop" (p. 308). The analyzed place of the classroom included technically savvy boys who were socially shunned. Some of the girls in the class refused to become familiar with the technology, even though it was readily available, because they did not want to be associated with this particular group of boys. The machine itself carried an identity, then, of social exclusion and some students' technophobia resulted from the computer's identification. In discussing equitable access to technologies at the scale of policy, Valentine, S. Holloway, et al. (2002) argue that "we cannot focus on the provision of the technology alone. Rather, we need to understand how children and technology come together and how they are transformed by and transforming of each other" (p. 310).

Lægran (2002) described such places—where human interaction and technology intersect—as "technospaces" (p. 158). She investigated two particular technospaces frequented by youth in two rural Norwegian villages: the petrol station and the Internet café. Lægran was able to contrast the two Internet cafés and show that the new material spatial and social formations that accompany changes in technology are tied to local and global context in the construction of an Internet café as a certain kind of place. Although each Internet café was physically constructed in an existing space in a small rural village in Norway, the difference in the material structure of these places (i.e., a purposefully "urban" interior design and Italian coffee machine in one place and worn out couches and instant coffee in the other) made for very different social formations and uses of the Internet. In the "urban" café, the Internet was symbolic of urban culture and was used to reach out to the world. In the other café, which came to be thought of more as a youth center, patrons used the Internet to "extend their repertoire of identities as well as their network in the local community, with less interest in 'going global'" (p. 166). As with other offline places we discuss that were changed by the introduction of virtual geographies, Lægran argues that "this study suggests that youth make use of the Internet . . . in different ways to construct spaces suited to their lifestyles and orientations, and to communicate and mediate meanings within the village as well as the wider world" (p. 166).

Local area network (LAN) cafés, which offer LAN gaming (game play only with onsite players) for café goers as well connections to the Internet, in Australia, were also found to be formed as hybrid places through the complex intersections of the physical, social, and virtual:

> Their licensing requirements, their location in the city, their relationship to schools and the street, their connection to and disconnection from online global culture, and the mix of online and offline social interaction that goes on inside, give LAN cafés what we have described as a "liminal" quality, a refusal to be readily fixed and labeled. (Beavis, Nixon, & Atkinson, 2005, p. 58)

Beavis et al. (2005) also found that these cafés were important places of learning—"where people both learn and are taught computer-based skills, as well as social 'lessons' about how to act and be in the world" (p. 58).

A final example of physical place-making was the Deaf club in the United Kingdom. Valentine and Skelton (2008) describe the history of Deaf clubs, established throughout the United Kingdom in the 19th century as places where deaf people "could escape the oppressive oralism of hearing society (Stevens 2001) and develop an active sense of identity, culture and belonging predicated on their shared language—sign language (Padden and Humphries 1998)" (p. 472). With the more widespread use of the Internet, however, there is no longer a need to gather at Deaf clubs to communicate or receive information. Deaf people can access information online and communicate with each other in sign language without being in the same physical place. Valentine and Skelton present evidence that attendance at Deaf clubs is decreasing and that young deaf people, in particular, are organizing to meet at other offline places (e.g., pubs) in smaller groups. Some older people have expressed mixed feelings about the lack of younger people in the clubs: satisfaction at having the place to themselves, but sadness at the possibility that Deaf clubs will not survive into the next generation. These changes in physical places, the Deaf clubs, are accompanied by changes in online places for deaf people to gather, as they are now able to communicate via webcams with sign language-speaking people around the world because of the similarities among the world's 200 sign languages.

Immigrant Youth and Hybrid Places

We move now away from the construction and reconstruction of physical places to the formation of new virtual places. Several studies (Brouwer, 2006a, 2006b; Lam, 2000, 2004, 2006; Lam & Rosario-Ramos, 2009; Lee, 2006; Skop & Adams, 2009) considered the virtual places created and inhabited by immigrant youth (i.e., youth who are either immigrants themselves or the children of immigrant parents). These diasporas, formulated from negotiations and hybridizations among cultural identities, languages, and geopolitical distinctions represent sites of new possibilities for children's learning.

Skop and Adams (2009) surveyed Indian immigrants to the United States and their American-born children to consider how they used the Internet. They found that the Internet is a resource used by these immigrants "for overcoming separation at intra- and international scales, for creating a variety of connections across space and for constructing a sense of identity" (p. 128). New conceptions of identity and hybridized forms of community that are neither concurrent with "old" Indian culture nor, necessarily, the expectations of the host country are created—that is, new virtual places—as these diasporic people interact in virtual spaces. But the virtual places within which they interact are created, formed, and reformed, as they network among information and people grounded both in India as it is now and in dynamic relationship with elements of American culture. "Identities are forged across space as well as in places, and through both direct and indirect (mediated) communications" (p. 143).

This dynamic identity formation was not evident in Lee's (2006) study of Tongan immigrants on the Internet, which, as best we can tell, included textual analysis of the websites as artifacts and did not include interactions with the participants on the site. Still, she claims that many of the participants are youth and children of immigrants born outside of Tonga (particularly in the United States, New Zealand, and Australia). Lee's focus in this study was on the ways that language use is contested in cultural identity negotiations, especially as these negotiations take place across time and space on websites (i.e., particular online places) for and about Tongan culture. Although we can read these sites as places of hybridized cultural identity formulations, they were still highly contested places of ongoing negotiations, where some voices were silenced by an inability to speak certain languages (sometimes Tongan, sometimes English). Still, participants reported the value of the sites as places they could learn from others about Tongan culture and also speak freely and openly (because of the anonymity of participating) in a way that was not approved of in Tongan culture outside of these virtual places.

Like the Tongan youth who felt open to discuss issues and topics that they would not have been able to discuss in the physical presence of other Tongans—particularly adults—Moroccan Muslim immigrants in the Netherlands appropriated a website discussion forum for their needs, creating a new virtual place. Girls, in particular, focused the online discussion on issues of importance to them (e.g., religion, relationships, and marriage). Like the Tongan website, participants were anonymous, and this allowed them the possibility of openly discussing topics that would be prohibited in offline spaces.

In another analysis of Dutch Moroccan websites, Brouwer (2006a) outlines the construction of a new place for second-generation immigrants (Dutch-born children of Moroccan-born parents): an imagined Morocco. Brouwer argues that these second-generation children have no physical attachments to Morocco and so they create a place of imagined relationships to their parents' homeland by forming social relationships on the Internet with other second-generation Dutch Moroccan youth. At the intersections of these social relationships, and at the specific locales of these websites, these youth create a new place for learning and being.

Over the past 10 years, Lam (2000, 2004, 2006, 2009) has focused research on immigrant youth on the Internet, particularly in the context of language and literacy. Lam's work stands out among the other studies we review in this section for her explicit attention to learning. In all of these pieces, learning and identity work are explicitly tied together. Immigrant youth learn second-language literacy skills by interacting in cyberspace with other youth around the globe. But they also form identities as learners and English speakers that are hybridized—both local and global, and particular to the setting—the place—in which they perform.

In the earliest piece, Lam (2000) presents a case study of a Chinese immigrant teenager corresponding on the Internet with a transnational group of peers. Here, she explicitly calls on educators to reconsider the significance of identity formation in learning to become literate in a second language, as her focal participant gained confidence in a variety of English language uses on the Internet while previously

feeling alienated from native-born Americans offline. Later, Lam (2004) studied two Chinese immigrant girls participating in a bilingual chat room. Again, she focuses on the role of identity construction and language use for the focal participants and their friends around the globe in a hybridized space: "a mixed-code variety of English is adopted and developed among Yu Qing, Tsu Ying, and their friends to construct their relationships as bilingual speakers of English and Cantonese" (p. 59). Spending time in the chatroom gave the girls the confidence to speak English to others, but it also created a new place of identity for Chinese immigrants around the globe—the kinds of place formations that would not have been possible prior to the spread of the Internet.

In Lam (2006), the contextual elements at play in hybridized place construction are expanded to include the flow of cultural materials "that provide new avenues for people to construct social relationships and identities beyond a bounded notion of national belonging" (p. 172). Lam focuses on two case studies: The first includes the same focal participants from the previously discussed study, whereas the second involves a Chinese immigrant boy creating and maintaining an anime website. Lam's analysis centers on transnational identity making among these youth and others online in a way that recognizes the flow of cultural influences in their online activities and calls on educators to consider ways that children and youth could be given tools to critique, analyze, and reflect "on the relationships they were developing with their peers around the globe and how these relationships were constructed and represented through the use of language, symbolic media, and forms of communication" (p. 189).

Lam's (2009) final study under consideration expands the scope of her previous studies, using interview data with 35 adolescents of diverse national origins along with survey data from 262 foreign-born high school students in the United States to explore "the ways in which young migrants of diverse national origins in the United States are utilising digital media to organise social relationships with friends and families, and engage with news and media products across the United States and their native countries" (p. 174). Again, learning plays an important role in Lam's findings. For example, she points out that IM and email are ideal ways for these immigrant youth to maintain proficiency in their home languages as well as to learn English. When IMing in English, participants are able to look up unfamiliar words in an online dictionary and learn the word's definition, synonyms, and antonyms. As with the other studies, identity making across national borders and home- and host-country languages play out with these students. Lam argues that the experiences of these youth online require a reconsideration of multilingualism such that we "grapple with how multilingual literacies can be fostered and used to build connections and develop knowledge across cultural and geopolitical territories" (p. 187).

"Trajectories" Across Virtual Geographies

As our review of studies from the perspective of "place" has shown, the in-placeness of locations for learning and living made possible by new technologies requires an

understanding of place as negotiated space, as locations in a nexus of relations. We move now to the second section of this review of virtual geographies, where we consider the ways that children and youth move across and through such physical and virtual places in life trajectories. These trajectories are formed as individuals move through online and offline spaces and across time and distance. Life trajectories also come in contact with and are affected by the trajectories of technological advancement. That is, there are trajectories to the developments of technologies as there are to the developments of humans and that these trajectories intersect and interact in ways that have import for children and their learning. Learning along pathways of trajectory from place to place (including places physical and virtual) is afforded not only by pausing in those places along the way but also by and through tools that make learning and connecting on the move a possibility (e.g., cell phones). This section reviews empirical studies that approach trajectories from two vantage points: First, we review studies that show the mutually constitutive nature of trajectories through online and offline places—that is, the ways in which the social landscapes of the virtual and physical worlds form and reform each other as children and youth move across them; second, we review studies that examine mobile technologies (i.e., the mobile phone) as key tools in the trajectories of children and youth through and across virtual and physical geographies.

Social Formations Mutually Constituted Through Online/Offline Trajectories

Insofar as the life trajectories of children and youth include the increasing capacity for online interactions as technologies become available and as children mature, researchers have found that these changing capacities tend to enhance current social formations rather than significantly alter them (Thulin & Vilhelmson, 2005, 2006; Valentine, S. L. Holloway, et al., 2000). This is not to downplay changes in social formations afforded by the Internet but rather to point to the way that online and offline behavior are mutually constituted (Holloway et al., 2000; Holloway & Valentine, 2001). In considering changes in social formations brought about by changes in virtual mobilities, Thulin and Vilhelmson (2006) started by asking about time displacement. They argue that time spent on the Internet necessarily involves time taken away from other activities and wondered what would happen as time spent on "virtual mobility" (p. 29) increased. This issue of time displacement is important to establishing changes in social formations brought on by the widespread use of the Internet because new activities on the Net imply changes in social activity patterns elsewhere. Specifically, Thulin and Vilhelmson point to the stationary, place-bound nature of online activities conducted from a computer fixed in geographical space and ask

> how this tension between spatially exploding networks characterized by flexible use of place, on one hand, and imploding, place-bound privatization of solitary activities, on the other, actually affects everyday life—i.e. local communities and people's use of place. (Thulin & Vilhelmson, 2006, p. 30)

They found, in a study that included data from nationally distributed surveys of Swedish youth as well as in-depth interviews and time-use diaries from a smaller group of participants, that time spent with information and communication technologies (ICTs) decreased personal time spent with other media (e.g., television, music, DVDs) but did not take away from social time spent in offline relationships. Also, they found that the Swedish youth in their study used ICTs to sustain and reinforce local contacts and seldom established completely new contacts as a substitute for their existing local social relationships. The key here is that existing relationships were not displaced as these youth moved across new virtual geographies. Instead, ICT use "generally enhances rather than undermines children's friendships" (Valentine, S. L. Holloway, et al., 2000, p. 163).

Further, new technologies become integrated into old ways of life (Valentine, S. L. Holloway, et al., 2000). As evidence of this, playing computer games and surfing the Internet became new ways of sharing time with friends rather than replacing that time or those friendships. Using the Internet even improved the ability to maintain contact with offline friends through the ability of rural school children to meet online when meeting face-to-face would have been prohibitive because of distance. Chat features also improved communications among friends who could previously only interact individually with different members of the group over the phone. Now, an entire group of friends could gather in one virtual locale. Local social relationships maintained their importance despite the desires of adults for rural children to expand their global and educational horizons via the Internet (Valentine & S. L. Holloway, 2001). While adults hoped that their children would develop characteristics of global citizens by engaging with others in virtual space, children interacted with their offline peers or added new friendships.

Although children's "virtual activities are not, in practice, disconnected from their off-line identities and relationships" (Valentine & S. L. Holloway, 2002, p. 316), the extensibility afforded by the Internet did enable children to reconfigure, realign, and extend their social relationships and identities. This contrasts somewhat with previous findings (Valentine & S. L. Holloway, 2001), in which adults hoped that extensibility would enable global relationships and learning. Here, the researchers do not necessarily find that children are cultivating global friendships (in contrast, cf. Leander & Mills, 2007) but that they do extend beyond the local in the establishment of new social relationships.

As social trajectories move across physical and virtual geographies, the online and offline are mutually constituted. Specifically, Valentine and S. L. Holloway (2002) found four different processes through which children's offline worlds were incorporated into their online worlds

> through direct (re)presentations of their off-line identities and activities; through the production of alternative identities contingent upon their off-line identities; through the reproduction on-line of off-line class and gender inequalities; and through the ways in which everyday material realities limit the scope of their on-line activities. (p. 316)

They also identified four different processes through which children's online worlds were incorporated into their offline worlds, including incorporating online information into their offline activities, maintaining relationships, changing offline social networks with online friendships, and recontextualizing activities and identities (p. 316).

Trajectories Involving Mobile Technologies

Thus far, we have mostly focused on studies that document changes in children's virtual geographies brought about by and through interactions on the Internet. But perhaps even more revolutionary than the technologies associated with the Internet are mobile technologies, primarily cell phones (J. E. Katz, 2006; Sheller, 2004). Although both Internet use and mobile technology use have been shown to co-constitute the virtual and the physical, Ito (2005) argues that the trajectories across virtual and physical are different with Internet and mobile technologies:

> Internet studies have been tracing the increasing colonization by real-life identity and politics of the hitherto "free" domain of the Net; *ketai* [mobile phones in Japan] represent the opposite motion of the virtual colonizing more and more settings of everyday life. (p. 8)

Mobile devices are used on a broader global scale than ICTs: By 2005, one in three humans on the planet were mobile phone users (J. E. Katz, 2006), and the rates of mobile phone adoption among people in developing countries were staggering (Sheller, 2004), including the expansive use of cell phones "in the squatter communities that surround the cities of developing countries, places where conventional wired phones have never existed" (Townsend, 2000, p. 86). Youth in many countries have nearly ubiquitous access to mobile phones (see Matsuda, 2005a; Thulin & Vilhelmson, 2007). As Ling and Campbell (2009) have argued, "the proliferation of wireless and mobile communication technologies gives rise to important changes in how people experience space and time" (p. 1). "Phone-space" has become each individual's node of connection to "the temporally, spatially fragmented network of friends and colleagues they have constructed for themselves" (Townsend, 2000, p. 94). In this section devoted to "trajectories" and in the final section of the review of virtual geographies devoted to "networks," we review studies that consider some of these important changes in experiences of time and space—for example, the maintenance of complex and spatially distributed social networks, the changing nature of private and public space (see Wellman, 2001), and new practices of coordination—among children and youth brought about by the increasing use of mobile technologies. Here, the focus is on the ways that children and youth move across the physical and virtual landscape while nearly always connected to "phone-space" (Townsend, 2000, p. 94).

Although Thulin and Vilhelmson (2007) found access to mobile phones in Sweden to have nearly reached the saturation level by 2002, they found lower levels of use: the youth in their study averaged 2.5 contacts per day (SMS text messages and voice calls). This study included time-use diaries and in-depth interviews

with 43 high school students living in a medium-sized city in western Sweden. The researchers followed up their initial contact with another wave of interviews and time-use data 2 years later, when the students were out of high school. They found that social contacts and interactions increased with increasing use of the mobile phone and that the role of physical proximity in maintaining social relationships was diminished. As has been shown in studies throughout our review, the technology, in this case the mobile phone, complemented rather than replaced existing social networks. One way it complements existing social networks is to allow the possibility of more impulsive gathering. The researchers also found that the social practices of scheduling and coordinating face-to-face meetings and joint activities have changed significantly with an increasing use of mobile phones: "A more *impulsive and hasty practice of decision-making* has evolved, characterized by continuous negotiation and re-negotiation, a preference for retaining freedom of action as long as possible, and last-minute choices" (Thulin & Vilhelmson, 2007, p. 249). Because leisure time is no longer scheduled ahead of time and fixed to specific times and places, youth were more careless about timekeeping.

One element of Thulin and Vilhelmson's (2007) study points to issues in our using empirical studies published in academic journals to gauge the current usage of mobile technologies. They report, for example, that by 2002 phone applications such as Internet browsing, email, digital media players, and built-in cameras were not yet available and "when asked about such upcoming features, the interviewees showed a rather shallow interest" (p. 241). In a third wave of research with this same set of participants (Thulin & Vilhelmson, 2009), conducted in 2005, Thulin and Vilhelmson still found little adoption of new cell phone features (but contrast this with the early adoption and heavy use of these features, i.e., Internet browsing, email, cameras) among youth in Japan (see Matsuda, 2005a, 2005b; Okada, 2005). Surely this has changed over the last few years. And yet these studies were published within the past 2 years. Thus the ability of our empirical work to keep up with rapid changes in technology and, in particular, to account for the effects of these changes in the everyday lives of children and youth through ethnographic studies is called into question. Smartphones (e.g., the iPhone and the Blackberry) are continuously upgraded, increasingly giving youth access to computer and Internet applications at all times and in all places. Additionally, applications that have not been typically associated with laptops and the Internet (e.g., GPS technologies) are now available on phones. We would expect to see studies in the future that document, for example, the ways that children and youth are afforded new opportunities for learning across their life trajectories through the use of iPhone applications.

Youth not only use their phones to communicate across spatial distance but also use them for particular symbolic purposes in negotiating on-the-ground social relationships (J. E. Katz, 2006). Students in Katz's small study would pretend to talk on the phone if walking home late at night as a signal to would-be attackers that they were in contact with someone who could help immediately. They would also use their phones as symbols in other social relationships: pretending to be having a

mobile phone conversation as a way of avoiding talking face-to-face with someone, or pretending to get a call as a way of getting out of an embarrassing social situation. Katz argues that "there is a large world of communication usage having little to do with those who are distant or virtual and everything to do with those who are co-located, socially and physically with the user" (p. 11).

Ito et al. (2005) edited a collection of studies that investigated mobile phones in Japanese life. Mobile phones in Japan are called *ketai*, which roughly translates to "something you carry with you" (Ito, 2005, p. 1). Ito (2005) differentiates the relationships suggested by the term *ketai* as opposed to the American "cellular phone" or the British "mobile": "A *ketai* is not so much about a new technical capability or freedom of motion but about a snug and intimate technosocial tethering, a personal device supporting communications that are a constant, lightweight, and mundane presence in everyday life" (p. 1). This "intimate technosocial tethering" suggests the relationships between social life and technology that we have seen across the studies in this section: Through life trajectories, the virtual and the physical and the social and the technological are mutually incorporated.

In one of the studies in the Ito et al. (2005) collection, Okada (2005) followed from theories of social construction of technologies in showing how youth culture influenced the developmental trajectory of mobile phone technology in Japan. He has been conducting research on mobile media use in Japan over the past 15 years, and he uses surveys, statistical data, and on-the-street interviews to capture and describe the historical development of technologies. As one example of the social construction of mobile technologies in Japan, Okada describes the trajectory of pager development. Pagers were initially designed to allow a person receiving the page to call the phone number on the pager. But Japanese youth began using the pager as a way of exchanging short messages with words being assigned to sequences of numbers and codes. Seeing how youth were using the pagers, pager manufacturers added a new function to the pager that converted certain number combinations into letters or phonetic symbols that could be read by all. These developments, of course, eventually led to text messaging. The interrelated development of youth life trajectories and technologies is also evident in other examples that Okada describes (e.g., ring tones and camera phones).

Young people across the globe (specifically in Europe, the Americas, Africa, and the Asian Pacific) have been quick to adopt new mobile technologies and integrate these technologies into their everyday lives, finding new purposes and uses for devices beyond those intended by designers (Castells, Fernández-Ardèvol, Qiu, & Sey, 2007). As studies of Internet usage have also shown, the mobile technologies used by these youth across international contexts help maintain traditional social institutions (e.g., school and family) despite the fact that the phone offers new autonomies. One key factor in the availability of mobile technology and the uses of new technologies was the purchasing power of the youth. Differences were found, for example, in the uses of mobile phones by American children for game playing as compared with young Chinese migrant workers who do not download games.

In addition to studies that have shown the repurposing of mobile communication devices (i.e., pagers and cell phones) along the development of people and technologies, there is evidence that youth repurpose other mobile technologies for learning and identity construction across their life trajectories. In the context of their broader case for considering how multimodal analytic frameworks can be used for studies of mobility, Leander and Vasudevan (2009) include a brief case description of Joey, a 19-year-old man who produces and displays multiple texts using a PlayStation portable (PSP) gaming device. Joey used the camera features and an image-editing program built into the PSP to document his movements and time with friends in a variety of settings across an urban landscape. The affordances of the device and Joey's social purposes for using it to create images and videos that he can subsequently display on his MySpace profile and other places mutually shaped one another.

"Networks" Across Virtual Geographies

New changes in the virtual geographies of children and youth not only allow them to move in trajectories and pathways of learning like the ones we have shown, but they also make it possible at any point along these trajectories to connect across vast social networks (e.g., via the Internet or mobile technologies). Social networks may not be new, but the possibilities for engaging them has changed with the advent and spread of digital technologies: Wellman (2001) writes that "complex social networks have always existed, but recent technological developments in communication have afforded their emergence as a dominant form of social organization" (p. 228). (For further historical context regarding networked communities, see Wellman & Gulia, 1999.) This dominance extends around the globe (Castells, 2000) and has implications for the ways in which children and youth live and learn across time and space:

> Contemporary life is dominated by the pervasiveness of the network. With the worldwide spread of the mobile phone and the growth of broadband in the developed world, technological networks are more accessible, more ubiquitous, and more mobile every day. The always-on, always-accessible network produces a broad set of changes to our concept of place, linking specific locales to a global continuum and thereby transforming our sense of proximity and distance. (Varnelis & Friedberg, 2008, p. 15)

In this final section of the review of changes in children's virtual geographies, we consider studies from the perspective of the network. We focus on two key areas of work: The first is studies of youth social networking via the Internet and other mobile technologies; the second is networking through gaming.

Social Networking Through the Internet and Other Mobile Technologies

boyd (in press) and her colleagues found that during the course of their landmark study (Ito et al., in press) aimed at documenting the new media practices of youth in the United States from 2005 to 2008, they "watched as a new genre of social media—social network sites—gained traction among U.S. teenagers." (For a comprehensive introduction to social network sites, see boyd & Ellison, 2007.) A social network site

is an Internet site that allows users to "(1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system" (boyd & Ellison, 2007). Although boyd (in press) admits that not every teen frequents social network sites, she argues that from the years 2004 to 2007 "social network sites became central to many teens' practices." Despite this centrality, research into youth social networking via social network sites is sparse because of the relative newness of these sites and of youth engagement with them. Still, boyd has published two studies (boyd, 2007, in press) that investigate the everyday uses of social network sites by young people.

boyd (2007) spent 2 years observing and interviewing U.S.-based youth as they engaged with MySpace (a social network site), following them across online and offline spaces, and systematically documenting their practices with MySpace. She found that MySpace and other social network sites act as networked publics, "spaces and audiences that are bound together through technological networks (i.e. the Internet, mobile networks, etc.)" (p. 125). boyd documented the ways that the networked public nature of MySpace came into conflict with young people's desire for MySpace to be "my space," a place "for teenagers to be teenagers" (p. 132) and with their identity work in perceived local settings when viewed more globally. As an example of the latter, boyd describes a call she received from an admissions officer at a prestigious college who was shocked to find that a student to whom they were planning on offering a scholarship had a MySpace profile "full of hip-hop imagery, urban ghetto slang, and hints of gang participation" (p. 133), all of which seemed to counter his admissions essay about the problems of gang violence in his community. What boyd makes clear is that young people's movements across networks afforded by new technologies are not without consequences for their accesses to learning—although the possibilities for increased connectivity on a broader scale—with attendant increases in opportunities to learn—are possible, the ecology of the networked public can also be perilous.

Presenting one slice of the much larger corpus of data from the Digital Youth research project (see Ito et al., in press), boyd (in press) focuses on the role of social media in young people's friendship practices. She argues that learning to socialize with peers and make friendships "is a key component of growing up as a competent social being, and that young people need to be immersed in peer cultures from an early age." Viewed from this perspective, networked social media (social networking sites, mobile technologies) play a key role in youth learning to become adults. boyd found that virtual networks available via social media are not viewed as separated from the rest of young people's lives. Rather, social media are another way to connect with peers "that feels seamless with their everyday lives." These youth did not use social media as a networking tool to make contact with new people; instead, they maintained existing relationships with friends they knew mostly from school. But their networking with these friends, especially with a small-scale group of intimate friends, is maintained in "'always-on' networked publics inhabited by their peers."

This always-on network is kept up via mobile phones, IM, and social network sites. boyd found that the affordances of networked social media make it possible for social relations to be maintained beyond the constraints of physical space.

Youth are not only connected in networks via social network sites. They also participate in networks via other Internet technologies like IM and through mobile technologies. Kasesniemi and Rautiainen (2002) focused their study of Finnish youth, aged 13 to 18 years, on one particular aspect of mobile communication—the text message—and showed that the text message as a form of communication is able to overcome constraints of time and space that would otherwise inhibit communication and has a particular role in sustaining social relationships at all times (see also Johnsen, 2003): "Teenagers send messages during class in school, a text message unites two young lovers in the middle of the night, and a message sent by mom discreetly instructs the teen to come home from a party" (p. 171). Text messaging also allows for identity play, with some youth enacting brash personas via their text messages while exhibiting public shyness.

Internet-based IM is another method youth use in the construction of social networks. Networks constructed and maintained via IM by one immigrant youth (Lam, 2009) were found to be much more wide-reaching and complex than those reported in the other studies in this section. Lam reports on the case of Kaiyee, a 17-year-old recent Chinese immigrant to the United States, using data taken from a larger comparative study. Lam observed Kaiyee's online activities at her home over an 8-month period, conducted interviews, recorded Kaiyee's screen during IM exchanges, and engaged Kaiyee in a retrospective reflection on the IM exchanges. Lam also observed Kaiyee at school and interacting in the local Chinese immigrant community. Lam found that Kaiyee constructed—via IM and other social media—social networks that included the local (her peer group in the Chinese immigrant community), translocal (English-speaking Asian American youths in the United States who she had met while gaming online), and transnational (her peers in China). Kaiyee deployed various linguistic resources across these groups: "standard American English, hip-hop English, the Shanghainese dialect that she used in her family, Cantonese and Mandarin that predominated in her immigrant community, and both Mandarin and Shanghainese that connected her to people and events in China" (p. 393), often mixing her language. Kaiyee's maintenance of multiple identities and a rich linguistic repertoire via IM points to the affordances of new technologies to allow for networking across large gaps in space and time through which migratory youth can form and reform identities old and new.

Social Networking Through Gaming

In addition to the social networks constructed via the Internet and mobile technologies, gaming also presents an opportunity for children and youth to build networks. Although nearly all children aged 12 to 17 years in the United States have been found to play games online, on a console, or on their phones, only 21% of them play massively multiplayer online games (MMOGs; Lenhart, Kahne, et al., 2008).

In one survey of children's online activities in the United Kingdom, 70% of children aged 9 to 19 years reported playing games online, but MMOGs were not addressed specifically (Livingstone & Bober, 2005). Although playing MMOGs is clearly not an activity that all (or even most) children participate in, these games are played by millions of young people (Crowe & Bradford, 2006) and represent a significant change in the kinds of virtual spaces available to children. Studies of children playing these games describe their interactions in and with new virtual spatial formations and across new networks, navigating through these particular kinds of virtual geographies as part of their everyday movements.

In choosing to study the virtual world of Runescape, a free MMOG developed in the United Kingdom with an estimated 5 million young players, Crowe and Bradford (2006) argue that "virtual spaces must be understood as social contexts (in principle, like any other) where young people spend parts of their leisure lives" (p. 331). As with other network construction we have discussed, the new networks of MMOG geography extend from and are influenced and mediated by the material world. Geographically, Runescape "takes the form of a Tolkeinesque quasi-medieval environment incorporating towns, buildings, dungeons, forests, landscapes and seascapes within which gamers live their virtual lives" (Crowe & Bradford, 2006, p. 335).

In living out these virtual lives, Crowe and Bradford (2006) found that virtual spaces such as Runescape gave youth opportunities to make and remake identities both in and through the game space by, for example, creating avatars as public identity markers. Although there were significant findings here in regards to the possibilities of new networks afforded by such identity play and interactions in virtual worlds, Runescape also exemplified new alternative places where youth spend their time. In other words, Runescape was not only a new social space, but a new geographical place:

> In a world in which material public space (the street or the town centre) has become inaccessible to many young people or is considered risky or unsafe by them or their parents, it is not surprising that virtual public space has become attractive as a leisure setting. (Crowe & Bradford, 2006, p. 337)

For some youth, Runescape's virtual geography offered them a chance to spend time in relaxing "tourist locations" or "special spaces" (e.g., a waterfall or ocean beach), places where they could relax not only from the demands of their lives offline but also from the demands of work within the virtual environment.

Learning was also important for Runescape players. Working in the game world was necessary to develop a character within the game, and players "gain[ed] experience through in-game tasks or challenges: fighting, fishing, mining or cooking, for example" (p. 336). Although not all players strived to make a living in the virtual space—some were content to just hang out—gaining experience at a trade was valued and players were aware of the mistakes that new players (noobs) were making.

Networked possibilities are sometimes mitigated by social, physical, and virtual constraints. In three distinct social settings for gaming in Taiwan—at home, in

cybercafés, and in college dormitories—Taiwanese youth are subjected to regulating forces (Lin, 2008). This was especially true for young females. In examining the barriers to females who wanted to participate in games in each of these three settings, Lin considered both the social relations in the game world as well as those in the physical spaces wherein the game is played. Although Lin found significant barriers to female gamers in Taiwan participating in game play (e.g., sharing access to the home computer with family members, the design of cybercafés such that female players have to walk past pool-playing males that they view as threatening, or the perception that female players should not be disruptive roommates in college dormitories), he also found that MMOGs open up "new virtual spaces for girls to experiment with exploratory behaviors without worrying about physical danger or other consequences" (p. 79). The networks that female gamers participated in across the physical and virtual space had varying effects on their ability to comfortably play games.

Similar to MMOGs, online virtual worlds are spaces where thousands (or even millions) of players can interact, using an avatar to move from place to place across varied virtual landscapes. Unlike MMOGs, however, virtual worlds have less structure and allow for more choice in player mobility. Fields and Kafai (2009) focused on the in-game practice of teleporting in a virtual world called Whyville.net. At the time of this study, Whyville featured more than 1.5 million registered players aged 9 to 16 years. Fields and Kafai used a connective ethnographic approach (Leander, 2008; Leander & McKim, 2003) to follow a group of 21 players, aged 9 to 12 years, learning and sharing the practice of teleporting as they traveled across their virtual and physical geographies in and out of an after school club. Through their detailed efforts to follow the practice of teleporting across the entire group of participants, Fields and Kafai capture the networked nature of Whyville play. Participants moved in and out of many virtual and physical spaces available to them in order to learn a particular practice in the game. Collaborative learning and teaching were found to be occurring outside of the physical space of the club and across virtual terrain as well.

CONCLUDING (AND FUTURE) PROVOCATIONS: REMAPPING EVIDENCE AND EQUITY WHILE RESEARCHING LEARNING ON THE MOVE

Our subtitle for this review chapter is the phrase "mapping new mobilities," which we intended to move in two different directions and involve two different meanings of the "new." First, reviewing research within and beyond the education tent we have considered ways in which the social practices of youth involve forms of movement that are undergoing change. This perspective borrows from and extends research and discourses on social change, globalization, technology, and flows and, theoretically and empirically considering such changes, asks what relation these may have for the opportunities and environments for children's learning. From the research we have reviewed, it is clear that the new mobilities of youth are not merely a broader and faster version of "old" mobilities—that opportunities to become physically or virtually

mobile are simply expanding for children everywhere. A second and equally important perspective on the "new" reflexively engages theory and method with respect to methodology in educational research. Here, we ask what it would mean for education researchers to shift their historical vision of the classroom as a container for learning. What if the classroom were unsettled as a place, or were considered as a dynamic place-in-the-making? What if the classroom were considered as a point along a complex learning trajectory, or as a node in a network? At the base of this critical questioning is an assumption that theories of knowledge and learning—behaviorism, information processing, situated cognition, sociocultural theory, and others—always involve more or less explicit geographies or space–times of the individual in (or out of) a social "environment." Studying learning has always involved a notion of "where" and "when" learning is happening, whether that version involve studies of child development in psychological labs, classroom design experiments, or virtual ethnographies.

Making explicit and unsettling our assumptions about the when and where of learning is thus not simply making a repeated claim for the ubiquity of learning out of school, but rather, calling for the development of a learning theory that is expansive enough to fill the geographies and mobilities of children's actual lives. It is a push to move conversation from where we expect or desire learning to happen to where it does happen. The conversation on learning in this review focuses primarily on access and opportunity to learn at empirical and theoretical levels. However, a more intensive reappraisal of learning theories through a mobilities or geographical perspective pushes the field in a number of compelling directions: It moves us to reconsider fundamental assumptions about the role of the body in learning, about places of engagement and affect, about learning "transfer" as a psychological and social process of mobility, about development as distributed over social spaces and time, and about disciplinary ways of thinking as fundamentally "scaled" and shaped through particular forms, perspectives, and distributions of resources and people.

Although we have attempted to review complex and sometimes competing accounts, and although we have traversed literatures in human geography, critical geography, new literacy studies, media studies, sociocultural theories of learning, and others, the perspective on "mobilities" we have pursued is obviously incomplete and shaped by our own investments. For instance, we have largely shortchanged cultural studies analyses of youth identity construction amid globalization, including diaspora studies (e.g., Dolby & Rizvi, 2008). Such bracketing is not a critical assessment of this important work, but is chiefly strategic—a struggle with our own limitations to corral a very broad and diverse conversation with an eye toward rethinking issues of learning. In this sense, we have favored a consideration of the "how" of mobilities more than the "what," we have asked how youth (and learning resources) move, how these movements are changing, and how they might be studied in relation to learning. Somewhat implicit in our analysis is the notion that the mobilities of people and objects—whether on the ground or in the virtual—open up opportunity to learn and transform dead learning places into living ones. Problems of equity, then, can be

framed as problems of immobility versus mobility. Although we generally assume this orientation, we recognize a number of problems with it, including the fact that the associations between human and virtual mobility on the one hand and social mobility or economic mobility on the other are vastly understudied. Although it seems plausible that children who are moving through extensive online/offline networks, or are situated in engaging places, would at the same time be socially or economically "mobilized," the history of educational research suggests that social mobility cannot merely be read off of schooled or unschooled forms of learning (e.g., Graff, 1979).

Traversing research and theory-building within and beyond educational studies, we have organized our review through the constructs of place, trajectory, and network. These constructs were selected because of their current use as dominant metaphors and modes for reconsidering learning as it relates to "situation" or "environment." Moreover, the differences between and relations among "place" with "network" reflect contemporary conversations in geographic thought, where traditional notions of "place" are under challenge and the dynamisms of "place" relative to "networks" is being theorized (Massey, 2005; McDowell, 1997). In this manner and others, place, trajectory, and network are intended as orientations toward space–time that are mutually informing rather than mutually exclusive. We consider them different entrée points or perspectives that have different theoretical and methodological capacities for critiquing and recasting container-like notions of learning "contexts." Across these perspectives, within our partial mapping of theory-building and research in education, we raise the following key questions. Although issues of evidence and equity are fundamentally intertwined, we have separated them as a matter of emphasis:

Evidence

- What imagined geographies of learning are enacted in our historical or present research methodologies?
- How do our research methods actively construct space–times of learning through the types of data we collect, our perspectives on the data, our levels of abstraction, and our representational practices?
- To what degree do "scales" of activity exist in the world, and to what degree is "scale" a socially constructed abstraction for "distant" discourse and activity that we argue into existence?
- What methods or models might researchers develop to account for the dynamic simultaneity of multiple social spaces as well as movement across periods of time?
- What role is the moving, active body given in current research on learning? How is the body disciplined or made docile not only in school but also through research evidence?
- How would our current perspectives on causal relations and agency change if we seriously engaged not only how people use things, but also how things "use" people? What would it mean to give nonhuman actors their "due" in educational research—to consider how policies, material objects, technologies, and texts are on the move, translating people and entering into dynamic configurations with them?

- What are the specific spatiotemporal dynamics of a particular learning "environment"—its rhythms, tempos, extensibilities, connections to other social spaces, durations, internal divisions, accelerations, fluidities, and other qualities? What would accounting for these spatiotemporal dynamics tell us about a learning environment that simply considering it as a resource cache—a box for learning "affordances"—would leave out?

Questions of evidence in educational research pertaining to imagined geographies, circulations of people and things, research "scale," and other issues are simultaneously questions of equity, as these methodological issues involve critical perspectives on what the "social world" is and how social goods are distributed within it. Extending these issues, the following questions more explicitly consider equity in educational research, calling for a spatiotemporal reappraisal of place, access, recruitment, and difference:

Equity

- How do children differentially experience school as related to other places in their everyday geographies, and in their geographical histories?
- For children who have few opportunities to build associations and attachments to places, including school-as-place, how can school places be made more open, accessible, and engaging?
- How is access to schools and learning institutions spatiotemporally structured into everyday life, including bodily as well as information navigation? How is learning to use these navigational forms made available to all students?
- Who is recruited by particular networks of education, including classrooms and schools, but also literacy, mathematics, magnet schooling, enrichment programs, summer programs, and so on? What passage points do children encounter to move through these networks, and which children are not permitted access through these passage points?
- What social and cultural differences become marked and identified in schools, or in places of learning outside of school? By what processes of mobility are such identity differences either disrupted or solidified? What are the consequences for opportunity to learn of these mobile identity processes?

To these questions for further theory-development and research from the educational research literature, we add additional questions synthesized from the literature on children's (human) geographies and virtual geographies. The questions raised by these bodies of work, for evidence and equity, serve to expand and challenge an emergent agenda in educational studies for studying children's learning across space and time.

Evidence

- To what degree do present studies of children's mobilities and learning account for their routine and constant traversals across material and virtual spaces, or the "always-on" presence of the virtual during face-to-face engagements?

- How do present accounts of learning and development take into account socio-technical co-development, or the reciprocal and continual transformation of children and machines? Further, from this perspective do learning and development have spatial extension as well as temporal duration?
- To what degree are liminal places and spaces, such as physical street scenes and virtual streets, key sites for learning and identity work?
- What do social networks reveal about children's opportunities to learn, and how might such networks be considered in relation to actor networks?
- How might current methods of studying children in situ be complemented by methodologies of understanding their movements across space time and their interpretations of social spaces, including GPS/GIS technologies for mapping embodied movements, time diaries, and free recall maps?

These methodological questions gleaned from the human and virtual geographies of children are expanded by a large range of considerations of how learning opportunities are shaped and constrained by marked inequalities of mobility for different groups of children, by new geographies of fear, by the commercialization of the social world, and by other critical issues.

Equity

- To what extent do children of different cultures and backgrounds, and different geographical locations, experience self-directed mobility in physical and virtual spaces?
- Is the move indoors for children, over historical time, articulated with the move to the screen? To what extent has virtual mobility and play substituted for outdoor mobility and play of a generation or two ago, and what are key differences for learning in these forms of activity? How are the consequences different for different age groups?
- How are physical and virtual "home ranges" for children's mobility structured by adult fear, but also by social or virtual structures within particular communities and homes, financially supported access to institutional environments, the built environment of neighborhoods, transportation networks, and other phenomena?
- How is adult fear and surveillance of children, which appears to have increased historically, expressed in different cultural communities and how does this fear (unequally) constrain opportunities to learn?
- What types of learning about space and time are embedded into physical and virtual daily rounds? If children are becoming increasingly constructed as "immobile subjects" in embodied form, what consequences does this immobility have for (embodied) learning?
- In what ways does the institutional and commercial sponsorship and absorption of "public" spaces for children shape the opportunities to learn in these spaces, the identities of children learning in them, and the discourses and content embedded in them?

- Do children with robust online networks accelerate their means of acquiring and maintaining face-to-face social networks; is there a "Matthew Effect" of social networking and potential learning such that the rich get richer?
- How is the large amount of research on children's identity construction and identity geographies in digital practices research potentially relevant for understanding learning?

Our hope is that these questions, developed from our mapping of the field, serve to engage "futures conversations" concerning possible directions for research, including our own. With the expansion of new mobilities, the expansion of interdisciplinary relations, and the needed expansion of methodologies and theory, there is certainly plenty of work to discuss and set about doing. The latter questions emerging from human and virtual geographies make evident that when we engage with "new" youth practices of mobility that such practices and geographies present complicated and sometimes contradictory images. While children are experiencing new and rapid movements and new opportunities to learn, they are not simply caught up in an idealized version of global life that includes rapid and unfettered travel, continual technologies of instantaneity, and the compression of space by time. Rather, their learning lives are located, positioned, and emplaced in relations of power, politics, and culture. However, the locations of children, in and through which they learn, are not simple containers, are not bounded, and will not hold still.

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