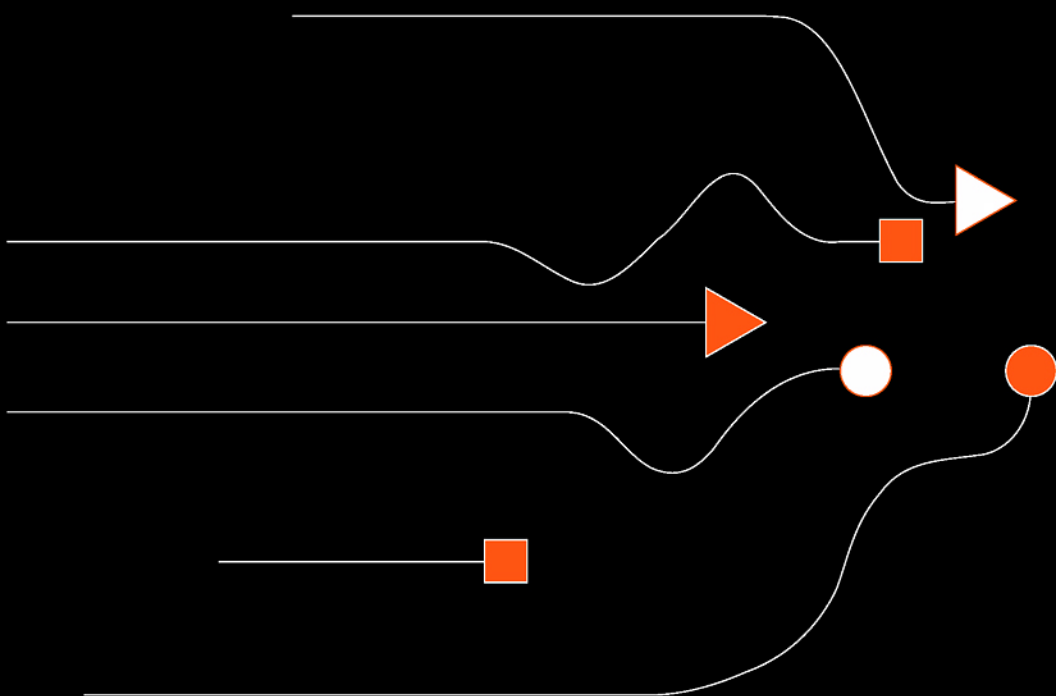


AHARON KELLERMAN

personal mobilities



Personal Mobilities

Living in a contemporary developed society means having access to a myriad of ways to communicate. One can either use public or private transport to meet others and talk face to face, or use a variety of communication networks, such as mobile or fixed telephones or the Internet, to travel virtually.

Personal Mobilities provides a systematic study of personal movement focusing on the dimensions of space, individuals, societies and technologies. Kellerman examines a variety of personal mobilities, including air transportation, through several perspectives, examining the human need for movement, their anchoring within wider societal trends, commonalities and differences among mobility technologies and international differences.

Although spatial mobility seems geographical by its very nature, the topic has been so far treated only partially, and mainly by sociologists. *Personal Mobilities* highlights geographical as well as sociological aspects and is the first book to focus solely on personal mobilities.

Aharon Kellerman is Professor Emeritus at the Department of Geography at the University of Haifa, Israel. He has been involved with the geographical study of telecommunications and information for over two decades.

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Personal Mobilities

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PREFACE

In some ways this book constitutes a continuation to my previous one, published in 2002 and entitled *The Internet on Earth: A Geography of Information*. That book was described as putting ‘forward a “conventional” geography on a slightly unconventional geography topic, information’ (pp. xi–xii), attempting to develop and present a systematic geography for information, with a special accent on the Internet. This book too is about information transmitted and consumed by people, but this time as part of a different perspective and phenomenon, human spatial mobility, in its widest sense, including corporeal mobility. Within human spatial mobility, our focus here is on personal mobility, or the movement of the self by the self. As we will see in the following first chapter, this topic has been mainly treated so far by sociologists, though spatial mobility seems geographical by its very nature. Spatial mobility at large and personal mobility in particular cannot be viewed as mere movements in space, as they both constitute and express social needs and deeds, which on their part are significant in numerous social as well as geographical ways. Mobility, thus, attests, among other topics, to the oneness of society and space.

This book is obviously aimed primarily at geographers and sociologists. It is further aimed at communications and transportation specialists, as well as at the growing interdisciplinary community of virtual communications studies (notably the Internet and wireless communications). The book may also be of interest to the urban planning and urban affairs communities, as well as to transportation and communications psychologists. Whereas this volume might possibly constitute a first attempt of its kind in the geography literature, there are two sociology books that treat mobilities written by Urry (2000) and Kaufmann (2002). In its focus on personal mobilities, this volume attempts to complement these books with a social-geographic perspective.

My own initial interest in mobilities at large and in personal mobilities in particular cannot be traced back to some specific past research project or to some past systematic exposure to the literature for teaching purposes. This interest was rather evoked through what may seem like an incidental kindling on, though within the context of, information geography. The 2003 Stockholm joint meeting of the Digital Communities (E*Space) project, headed by Kenneth E. Corey and Mark I. Wilson, and the International Geographical

Union (IGU) Commission on the Geography of the Information Society headed by myself, included a presentation by the Swedish philosopher and poet Ladislaus Horatius on the growing significance of mobility in contemporary society. This thought-provoking presentation ignited my own interest in the topic. At first I concentrated on the study of the socio-spatial significance of mobility technologies, followed by an interest in international differences, two topics that have later become the bases for Chapters Four and Five respectively. It took more than a year, until the fall of 2004, until I was able to crystallize and focus my thoughts and ideas on personal mobilities. Much of this was achieved during my affiliation with the Oxford Internet Institute, University of Oxford, where through intensive readings and discussions I formulated the book proposal and wrote the first two book chapters.

In the writing of this book and in its publication I was able to enjoy the cooperation and advice of numerous colleagues in many countries. Obviously, though, responsibility for the writings is mine only. Richard E. Hanley, co-editor of the Routledge *Networked Cities* book series showed a keen interest in the topic and the book idea and provided valued support in its advancement. I owe many thanks to William Dutton, director of the Oxford Internet Institute, University of Oxford, for hosting me. The most productive environment that has prevailed in the institute no doubt contributed to the development of my ideas and thoughts. The Burda Center for Innovative Communication, at the Communications Department, Ben-Gurion University, headed by Dan Caspi, provided some financial support that assisted in the final stages of writings. The Research Authority of the University of Haifa assisted in several ways the completion of this book.

Numerous colleagues read chapters and/or suggested ideas and references, and I owe all of them much gratitude: Maria Paradiso; Noga Collins-Kreiner; Ralph Schroeder; and Sven Kesselring. The illustrations were dedicatedly prepared by Noga Yoselevich, Department of Geography, University of Haifa. Several re-edited paragraphs in Chapters Six (pp. 129–33) and Seven (pp. 155–6), as well as Figures 6.1–6.2, were taken from my book *The Internet on Earth: A Geography of Information* (Kellerman, 2002).

Special thanks go to my wife, Michal, and to my entire family, for their bearing with me with great patience and understanding at intensive and sometimes unusual times and places of study and writing. The book is dedicated to my two granddaughters, Ronny-Naomi and Shiri-Rivka, who were born during the final stages of writing.

ABBREVIATIONS

CBDs	Central Business District
CRS	Computer Reservation System
FCC	Federal Communications Commission
GDP	Gross Domestic Product
GDSs	Global Distribution Systems
GPS	Global Positioning System
ICT	information and communications technologies
IGU	International Geographical Union
ISP	Internet Service Provider
LBS	location-based services
MMS	multimedia messaging service
MNCs	multinational corporations
MOO	MUD Object Oriented
MUD	multi-user dungeon
OECD	Organization for Economic Cooperation and Development
P2P	Peer-to-peer
POPs	points of presence
PTTs	ministries of post, telephone and telegraph
R&D	research and development
SMS	short message service
TCP/IP	transmission control protocol/Internet protocol
TTB	travel time budget
URL	Uniform Resource Locator
VoIP	voice over Internet protocol
WiFi	wireless fidelity
WTO	World Tourism Organization

Dedicated to Ronny-Naomi and Shiri-Rivka,
born with this book.

CHAPTER ONE

Introduction

A major characteristic of modernity, as well as of postmodernity, has been mobility: 'modern society is a society on the move' (Lash and Urry, 1994, p. 252). Moreover, the life of humans at large may be viewed through the metaphor of *homo viator* (Eyerman and Löfgren, 1995): human beings as constantly moving entities in both society and space. One major dimension of mobility in the modern era has been the spatial extension of the self via the transmission and receipt of information through the telephone, bringing about a virtual mobility of the self, and the subsequent emergence of what Janelle (2004, p. 109) termed as *info-mobility society*.

This ability of self-extension vis-à-vis the transmission of information has been enhanced and diversified in recent years through the Internet and the mobile telephone, which have presented impressive penetration and adoption rates by households. These three devices, the fixed and mobile telephones and the Internet, have in common the self-propelled operations by users for the transmission and receipt of information. On the other hand, information transmission services that depend on intermediary operating agents, notably the telegraph and postal services, provide a rather lagged interaction among users compared with the simultaneous interaction provided by telephone and Internet services.

The contemporarily growing virtual mobility has developed in parallel to a rapidly growing personal physical (corporeal) mobility. Of special significance in this regard has been the self-driven automobile, which has along the years become easier to drive and cheaper to buy. Current developed society may, thus, be viewed as being typified by an extensive self-moving in a double sense: moving of the self by the self. A rather unique mobility technology is the elevator. Whereas the automobile permits personal horizontal spatial mobility, the elevator provides for a vertical one (and the telephone facilitates both). Elevators are ordered personally for specific rides by personal users while operating automatically, but they may simultaneously serve in a single full ride several passengers and their specific routes.

Personal mobilities constitute self-propelled movements, which include, first, the natural corporeal (physical) non-technological self-moving, more simply known as walking, and obviously those physical mobilities extended by technologies (driving automobiles and bicycling and motorcycling). Personal mobilities further include virtual mobilities through fixed and mobile telephones and the Internet. Self-propelled mobilities exclude, by their very nature, the use of public transportation and communications, in which movements are mediated, though comparisons between automobiles, on the one hand, and buses and trains, on the other, as well as between telephones versus telegraph and postal services, have been made, and some will be made later on.

One comparative aspect that is important to note from the outset of this volume is choice. The choice of technological means for personal corporeal mobility is rather limited. Besides the automobile, as the major vehicle for personal mobility, there are bicycles and motorcycles, which are very flexible and efficient in traffic navigation and parking, but have their own limitations in driving abilities and comfort. The major choice in corporeal mobility is, thus, between personal mobility via automobiles, on the one hand, and public transportation, on the other. This applies mainly to daily commuting, for which fast public transportation systems, notably trains and underground railways, compete with automobiles, the driving of which may require more time and effort, and sometimes costly parking. In virtual personal mobility the contemporary scene presents much choice among media for personal mobility. There has emerged a choice of media for vocal communications (via telephones, mobile phones and VoIP), as well as of various media for written communications (e-mail, SMS, fax). Public virtual mobility via postal services and telegraph cannot compete with the instantaneity and convenience offered by these electronic communications means.

One exception to the definition of personal mobility that we have advanced so far will be air transportation, a type of mobility that for almost all travellers implies the use of public airlines, as the only possible venue for such mobility. Thus, one chapter of this volume will be devoted to air transportation (Chapter Eight). By their very nature, personal mobilities in the sense proposed here are cyclical, and thus exclude one-way long-range movements, consisting of change of residence, and compulsory or voluntary migrations.

The objective of this book is a double one. It will attempt to provide a joint treatment of physical and virtual personal mobilities, and such a treatment will go hand in hand with the presentation of a systematic study of personal mobilities. Such joint and systematic treatments of personal mobilities have not yet been provided, notably from a geographer's perspective. Back in 1997, geographer Cresswell lamented that 'geography, as the study of "Earth as the home of people", rarely takes mobility as seriously as it does place, space, landscape and territory' (p. 361). Several years later, sociologist Urry (2002, p. 255) argued that geography 'has not much concerned itself with the *social* bases of travel and its likely transformations. The geography of transportation has regarded travel patterns as *necessarily* generated by work, household, family and leisure

needs.' By the same token, Kaufmann (2004) commented that 'the reasons, constraints, and effects upon larger societal processes will remain obscured, if the geography of flows is considered in isolation, i.e. if we fail to examine the *modus operandi* of societal and political logic of movements in geographical space'. Along recent years these lacunas have become more significant and thus needed to be filled, because of the growing centrality of personal mobilities in contemporary societies. Furthermore, the socio-spatial dimensions of corporeal and virtual mobilities are interrelated and will be highlighted later on. From yet another perspective, the study of personal mobilities may be of importance for the study of other areas. Hence, Latham and McCormack (2004) used automobility as an example for their call to move urban geography back into the study of materialities.

Much of the study of mobility so far has been performed by sociologists, and this book will relate extensively to these studies, side by side with less extensive research by geographers as well as by scholars from other disciplines. An aspect of mobility that will almost not be related to in this book is mobility economies in its two related specialties: transportation studies treating the cost and benefit of automobile use, as well as the newer field of telecommunications economics treating similarly information transmission economies.

Interestingly, the very study of mobilities has some geographical dimension, as it is concentrated in Europe (notably in the UK, France, Germany, Switzerland and Sweden), and much less so in the US, the country that has led the world in the innovation and adoption of both corporeal and virtual technologies for personal mobility. American society seems to have taken technology-extended personal mobilities as more integral and almost obvious within their national society in the New World, a national society extended over a vast territory, and thus, calling for technology to assist in overcoming large distances. Furthermore, as the American society and economy have been driven by capitalist forces, special social accentuation has been put on constant technological innovation and the wide adoption of new technologies through aggressive marketing (see Kellerman, 1999).

The very idea of examining physical and virtual mobilities jointly is not novel. Geographer Graham (1998a) presented a co-evolution of the two mobilities, whereas sociologist Urry (2004a; 2004b) proposed to study the interconnections and interdependencies between the two. However, the actual study of personal mobilities has been more split. Mobility in space has usually been treated as rather physical mobility, focusing on automobiles (see e.g. Sheller and Urry, 2000; Freund and Martin, 1993). Sometimes, when noting on the social significance of travel, no differentiation was made between the use of public and personal modes of transportation (Urry, 2002). Social sciences at large, laments Urry (2004b), have neglected the study of mobility, thus being 'a-mobile', and only recently he recognized an emergence of a 'new mobilities' paradigm that he attempted to formulate (see Chapter Six). By the same token, in the field of transportation studies it was recently suggested to treat the transmission of information as virtual mobility, and the possibilities of

substitution between physical and virtual mobilities at large were explored (e.g. Lyons, 2002; Kenyon *et al.*, 2002).

Mobilities of human beings and their actual movements may be viewed as part of a larger set of material and invisible objects that can move or can be moved. These include people, commodities, information at large and capital (Kellerman, 1993, pp. 157–62; Appadurai, 1990). Urry (2000), following Mol and Law (1994), has adopted the metaphor of fluids for human mobilities. However, the physical and virtual mobilities of humans differ from each other when they are metaphorically compared to flows in nature. Thus:

Moving information with the use of modern telephone technology is as flexible as gas; it may change modes, shapes and volume easily and its transfer is fast, indeed virtually instant. The movement of people is similar to liquid. It may change travel modes and it is self-motored to some degree, but it is not instant and requires preparations. The movement of goods is like (and frequently is) solid. Moving is slower and requires handling. The movement of capital used to be closer in its nature to the movement of people and commodities, but has recently become similar to the movement of information, though capital transfers may still be regulated and reported.

(Kellerman, 1993, p. 160)

By their very nature, personal mobilities constitute four dimensions: people and societies, places and spaces, technologies, and human activities. Rather generally, these four dimensions jointly comprise people's daily routine movements embedded within societal structures and trends. These movements are executed through the use of technologies and they are carried out within and between places, involving or aimed at the performance of various human activities. Additional dimensions may include time and culture, notably language and its reflections of changing mobility modes and intensities. Time as a social dimension for mobility will be discussed in several places, whereas language and mobility will be discussed in Chapter Three.

Something that has become highly dominant in our daily lives is the possibility for two people to communicate, while both being on the road, so that both parties perform simultaneous personal physical and virtual mobilities. Other new possibilities include a person on the road communicating with information sources over the Internet web, with changing locations ('hosting') for these websites as the person moves, but without any ramifications to the user's ability to access these websites when the locations of these information sources change. These unprecedented forms and patterns of personal virtual mobility may imply, however, an adaptation to given spatial structures rather than facilitating their change. In other words, new sophisticated virtual mobilities permit us to be in touch without any regard to the location of the cities or countries from which communication comes, nor with regard to the internal spatial structures of cities from which we call.

A basic question may arise out of the new possibilities for mobile communications: if we can communicate freely from anywhere, and if we don't even have to care about the location of information (websites) that we access, could we assume a possible end of places? As we shall see later in this chapter as well as in following chapters, locations, or the fixed, have not lost their roles and importance in an increasingly mobile society. Maybe it is even the other way around: places and cities in the era of enhanced virtual mobility have attained an increased importance for face-to-face meetings, as well as for the coordination and control of physical and virtual flows. Thus, Wellman (2001b) concluded his analysis of the transition into mobile communications by noting that 'physical place is thriving' (p. 247).

Contemporary developed society expects individuals to get used to constantly changing technologies of mobility. People also have to learn how to make the utmost of existing technologies for both their personal and professional lives. These constant mobility challenges bring us to examine in the next chapter the very basic need for human beings to move, as compared with their need to stay in fixed locations, attempting further to elaborate on how these differing needs are being met by new physical and virtual mobilities.

Technologies have changed our abilities. The automobile is though less revolutionary than the telephone and its contemporary derivatives. Reaching remote terrestrial places has always been possible through walking or by animal riding. The automobile has provided foremost speed, convenience and autonomy, as compared to previously used walking, animal riding and horse and cart technologies. However, reaching other places through speaking and shouting using only the human natural voice has been very restricted compared to physical reach by walking, running or animal riding. Hence, the telephone constitutes a revolutionary technology for personal mobility, permitting both an extended reach in space, as well as instant contact in time. It is, thus, of importance to understand patterns of decision-making for the very adoption of cars and telecommunications devices by households, followed by routine decisions on their particular uses. Are these technologies substitutive, complementary or additive to each other?

These are some of the questions that this book attempts to present and discuss. Mobility is of and refers to people and societies. The book chapters will, thus, float between space, individuals, societies and technologies, and it will eventually attempt to tie these dimensions together in the concluding chapter. The presentation and analysis of personal mobilities will follow this chapter order: introduction; individuals; society; technologies; nations; places; cities; flight; and conclusion.

In the next chapter, on individuals, we will attempt to uncover the personal motives for mobility, followed by an exposition of the various facets of individual behaviour while on the move. The following chapter, devoted to society, will present and discuss the mutual relationships between contemporary societal transitions within which enhanced personal mobilities have emerged, on the one hand, and mobilities as an integral component for the continuing

unfolding of current societies, on the other. The next chapter, Chapter Four, will focus on technologies, and will present the various media for personal mobilities within a comparative framework, and will further discuss their social meanings. Chapter Five will have nations in its focus, and will expose similarities and differences among leading countries in North America and Europe, concerning longitudinal trends in household adoption of various mobility media, as well as international trends in household expenditures on mobility. The next two chapters will highlight the relationships between mobility, on the one hand, and fixity as location and place, and the possible geographical reshaping of cities and urban life, on the other. The chapter on flight will discuss tourism at large, and flight in particular, as a unique form of mobility, since for flying the option of self-propelled mobility does not apply, so that the use of airlines may be considered a type of personal mobility.

Before moving into the more detailed discussions of the various dimensions and aspects of personal mobilities in the following chapters, we have first to give some attention and consideration to definitions of mobility, as well as to the types of mobility. Also, the basic and major features of personal mobilities at large will be presented: extensibility; accessibility; speed; convenience; and fixity.

Mobilities

Mobility is a multifaceted term. For human mind and action it was described as:

From displacement from one location to another to the freedom of movement which is symbolically equated with social mobility, to the feelings of pleasure in effortless flight which has roots in infancy, to the fundamental psychic link of motion with causality and subjecthood first described by Aristotle. But mobility also suggests the opposite of subjecthood, the freely displaceable and substitutable part, machine or human, which enables mass production and a consequent standardization brought to the social as well as economic realm.

(Morse, 1998, p. 112)

A basic definition for mobility, from the perspective of transportation geography, states: '*Mobility* refers to the ability to move between different activity sites' (Hanson, 1995, p. 4). By the same token, *movement* was described as 'the idea of an act of displacement that allows objects, people, ideas – things – to get between locations' (Cresswell, 2001a, p. 14). Note that movement, or the mobile, was defined here through a negative form of the term place (displacement), which traditionally describes the fixed! This rather physical connotation for movement/mobility is typical within human geography, referring to the very human ability to move oneself in the sense of daily physical spatial mobility

(see e.g. Ogden, 2000; Urry 2004a). Others, notably sociologists, prefer to refer to this kind of mobility as *spatial mobility* (Kaufmann, 2002). Bonss and Kesselring (2004, p. 5), on the other hand, preferred a rather social and more restricted definition for mobility: 'an actor's competence to realize certain projects and plans while being "on the move"'. This seemingly more restricted definition has led to the development of a new notion of *motility*, which we shall discuss later on.

In some other instances mobility definitions may relate not just to routine cyclical rides and walks, but also to long-distance (in space) and longer range (in time) human movements of immigration, tourism, residential change, mobile resistance movements, and the wandering of youngsters, etc. (see e.g. Verstraete and Cresswell, 2002; Kaufmann, 2002, p. 35; 2004; Urry, 2000, pp. 145–7, Cresswell and Dixon, 2002). Some of these movements might be two-way ones, notably tourism, whereas others are one-way ones, notably migrations. Spatial mobilities may, thus, be differentiated between reversible ones (daily trips and travel), as compared to irreversible ones (migration and residential change) (Kaufmann, 2002, pp. 24–6).

The recent telecommunications/information revolution has given the term *mobility* yet another meaning, namely the human ability to make a rather abstract entity, information, flow electronically. Such electronically transmitted information may constitute a virtual extension of the self, through a phone call or an e-mail, or it may constitute more public pieces of information, not transmitted as a one-to-one or one-to-specific many messages by an end-user. The most obvious example for the latter is the receipt of information through a website. The mobility of information constitutes *virtual spatial mobility*. The mobility of information may be viewed as mobility for itself, or it may be defined in light of physical mobility. '*Virtual mobility* refers to the substitution of electronic transfers and exchanges for physical transport activities' (Janelle, 2004, p. 86). Urry (1999) termed as *weightless travelling* the virtual information flows through the Internet, whereas *imaginative travelling* refers to such flows through television. Though television broadcasts amount to one-way public transmission of predetermined information, they were compared to rather personal physical mobility via automobiles by Bachmair (1991) who claimed that 'television succeeded because it broadened and extended lifestyles associated with the motor-car; primarily those concerned with *mobility* as a shaping principle of communication' (p. 522). Others termed mobility vis-à-vis television, as *transport of the mind*: 'Television turns out to be related to the motor car and the aeroplane as a means of transport of the mind' (Rudolf Arnheim, quoted in Morse, 1998, p. 99).

Spatial mobility, physical as well as virtual, constitutes a double phenomenon. On the one hand, it relates to the *ability* to cross certain distances within certain time units. By human nature this ability is performed physically through walking or running, and virtually by speaking or shouting. However, in its more contemporary context, this ability may be measured through the availability of transportation and communications means. Personal spatial mobility may, thus,

be measured by the *adoption* of transportation and communications means by households. On the other hand, spatial mobility may also relate to the very *use* of these media, or the performed *movements* by actors. Hence, as far as personal spatial mobility is concerned, the various use relationships between media for physical and virtual mobilities have to be examined. Three possible relations may potentially develop between physical and virtual personal mobility media: substitution, complementarity or additivity. In line with the fluidity metaphor, Urry (2000, p. 32; see also Shields, 1997) points to the possible distinctions among mobilities by their rates of flow, their viscosity, depth, consistency and degree of confinement. By the same token, spatial movements were conceived as drained from many small ones in areas into lines, along the 'least net effort' (Cresswell, 2001a).

Kaufmann (2002, p. 40) sees spatial mobility in a seemingly wider sense of purpose, consisting not only of travel and daily mobility, but of migration and residential mobility as well. His view does not include virtual mobility (as stated explicitly on p. 46, but see also p. 35), but he treats jointly one-way or irreversible mobilities, such as migration and residential mobilities, with two-way, reversible movements, such as daily movements and travel. To some degree, the analyses of migrations and mobility in films advanced by Cresswell (2001b; 2002) follow a similar line.

The connection between mobility as a potential, namely the ability to move, with mobility as performance, or spatial movements, in the definition of mobility has brought several writers, notably Kaufmann (2002; 2004; see also Bonss and Kesselring, 2004) to propose the adoption of the term *motility*, a term borrowed from biology and medicine, referring there to animal or human organ capacity to move. Motility was defined 'as the way in which an actor appropriates the field of possible action in the area of mobility, and uses it to develop personal projects' (Kaufmann, 2002, p. 3). Motility comprises access, skills and transportation, and specifically includes:

all the factors that define a person's capacity to be mobile, whether this is physical aptitude, aspirations to settle down or be mobile, existing technological transport and telecommunications systems and their accessibility, space-time constraints (location of the workplace), acquired knowledge such as a driver's licence, etc.

(Kaufmann, 2002, p. 38)

As such, motility is 'a propensity to be mobile . . . which is likely to vary in intensity from one person to another' (Kaufmann, 2002, p. 39). At yet another place, motility was defined somewhat differently: 'Motility can be defined as the operation of transforming speed potentials into mobility potentials' (Kaufmann, 2002, p. 99). These definitions lead to a somehow tautological objective: 'The idea is to measure whether convergence between motility and mobility is more advanced in people who are more mobile' (Kaufmann, 2002, p. 49).

Spatial mobility implies more than merely ‘a neutral liaison time between a point of origin and a destination. It is a structuring dimension of social life and of social integration’, and it is a social value. Also, ‘*mobility is polysemic and does not itself reveal what underlies it*’ (Kaufmann, 2002, pp. 101–3). In the next two chapters we will attempt to delve into those supposedly ‘hidden’ individual and societal meanings of spatial mobility, but some of its meanings might be more disclosed. For Baudrillard (1966, p. 66), for example, ‘effortless mobility entails a kind of pleasure that is unrealistic, a kind of suspension of existence, a kind of absence of responsibility’. Motility has been seen by Kaufmann (2004) as constituting also a resource ‘for the reconciliation of an increasing number of spheres of activity and projects that are spatially more scattered’. This view led him to the idea of *movement capital* as a measure of movement potentiality. We will examine this idea in Chapter Five, albeit from a perspective of mobility as actual movement, when we will present changing household expenses on mobility media in various countries.

The term mobility has received a different and rather sociological connotation within the context of *social mobility*, referring to status transitions of individuals and social groups along societal strata. One may argue that social and spatial mobilities are interrelated, in the sense that upward social mobility may normally imply extended and increased spatial mobility vis-à-vis an enhanced ability to purchase and use automobiles and telecommunications services. Also, one could assume an extended ability to use and benefit from these mobility technologies, notably the Internet, if an elevated social status is accompanied by additional education. Such a relationship may potentially also go the other way around: increased physical and/or virtual spatial mobility may imply wider information and physical reach, thus providing stimulation and opportunity for social mobility. However, several contemporary writers argue that the seeming and rather logical connection between social and spatial mobilities is just not there anymore (Kaufmann, 2002, pp. 12–13; Bonss and Kesselring, 2004), at least as far as physical mobility is concerned. For virtual mobility, however, it was argued that ‘it is no longer geographical space that differentiates but virtual space’, and ‘the more telecommunications there is, the more social mobility’ (Kaufmann, 2002, p. 29).

Extensibility and Access(ibility)

The two terms extensibility and accessibility seem by their very nature to be closely related to spatial mobility. However, mobility is not fully synonymous with *extensibility*, originally defined by Janelle (1973), as ‘the expansion of opportunities for human interaction’ (p. 11). Extensibility was redefined later by Adams (1995), as well as by Kwan (2001a), to mean ‘the ability of a person (or group) to overcome the friction of distance through transportation or communication’ (Adams, 1995, p. 267). This latter definition seems synonymous with the ability part of the wider mobility realm, and it connects people with

technologies. As such, it refers to potentials for movements but not to the materialization of these potentials. As far as personal mobilities are concerned, extensibility may thus be measured by levels of household adoptions of mobility means such as automobiles or telephones.

Accessibility was defined as 'the number of opportunities, also called activity sites, available within a certain distance or travel time' (Hanson, 1995, p. 4). Accessibility, in this sense, is complementary to extensibility. Whereas extensibility refers to the ability to move, or potential movement, accessibility refers to potential locations, or the fixed, to be reached by potential movement. Access(ibility), thus, connects between people and locations. These definitions are normally those used in geography. For Kaufmann (2004), though, access refers to potential movement 'the range of possible mobilities according to place, time, and other contextual constraints'. Such a definition is in line with a growing use of the term access beyond its original spatial connotations referring to public access to resources and opportunities (see Rifkin, 2000).

Access is seldom full and undisturbed. No entry road signs for both pedestrians and automobiles may either prevent access altogether or amount to additional travel or walking, thus increasing travel time and costs amounting to decreased access. Traffic lights and other forms of traffic control have a much softer effect on access, mostly in terms of travel time at large. In virtual mobility such barriers on access are less significant, though one may be denied calling back to a calling party in telephone services if the calling party's number is hidden. A different source of barriers on virtual access is anti-virus software preventing access to e-mails or websites if they seem infected. Another virtual access barrier may be censorship on websites, though such attempts by various countries have turned out to be less effective.

Speed

One way of spatio-temporal measurement for both physical and virtual mobilities is checking the duration, or time of movement in space, or along distance, from origin to destination (see Avidan and Kellerman, 2004). Hence, enhanced physical or virtual mobilities may imply the speeding-up of movements of both people and information in time-space, respectively. Speed per se was viewed as 'an irresistible temptation beyond reasonable rational calculation' (Hägerstrand, 1992, p. 35).

Speeding-up implies further enhanced accessibilities, as was simply demonstrated by Janelle (2004). If average speeds increase from 60 to 70 km/h, then the distance travelled within 30 minutes from a central point increases by 5 km or by 17 per cent. This latter addition increases the accessible area from 2,827 sq km to 3,848 sq km, or by 36 per cent! Data for US average commuting distance, speed and time for 1983–95 presented by Janelle (2004) permitted to show that whereas commuting distance increased by some 36.5 per cent, commuting time increased by just 13.7 per cent, because speed increased at