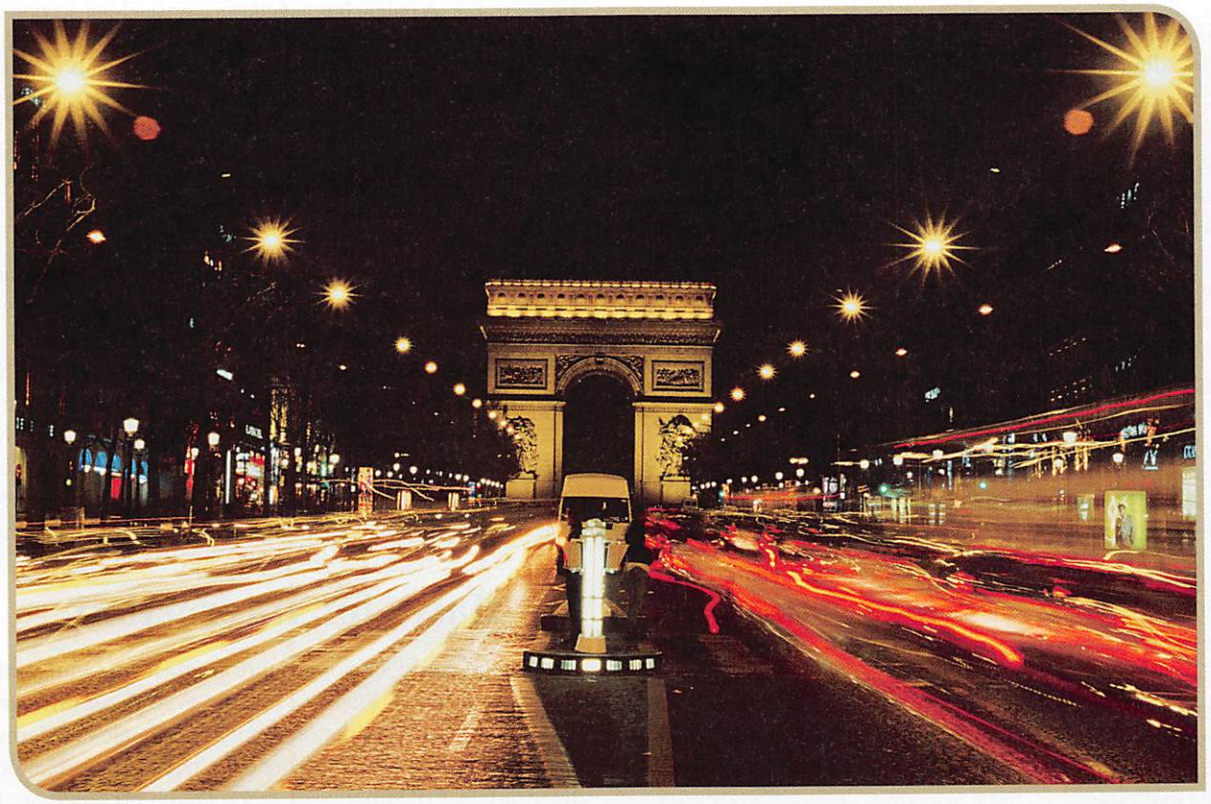
CHAPTER 3

SPATIAL INTERACTION AND SPATIAL BEHAVIOR



The blurred lights of traffic on the Avenue des Champs Elysees in Paris, France, typify spatial interaction in contemporary society.

AP Learning Objectives

- Define major geographic concepts that illustrate spatial relationships.
- Explain how major geographic concepts illustrate spatial relationships.
- Describe different ways that geographers define regions.
- Explain factors that account for contemporary and historical trends in population growth and decline.
- Explain how different causal factors encourage migration.
- Describe types of forced and voluntary migration.
- Explain historical and contemporary geographic effects of migration.
- Explain the processes that initiate and drive urbanization and suburbanization.
- Explain causes and geographic consequences of recent economic changes, such as the increase in international trade, deindustrialization, and growing interdependence in the world economy.

Early in January of 1849 we first thought of migrating to California. It was a period of National hard times . . . and we longed to go to the new El Dorado and "pick up" gold enough with which to return and pay off our debts.

Our discontent and restlessness were enhanced by the fact that my health was not good. . . . The physician advised an entire change of climate thus to avoid the intense cold of Iowa, and recommended a sea voyage, but finally approved of our contemplated trip across the plains in a "prairie schooner."

Full of the energy and enthusiasm of youth, the prospects of so hazardous an undertaking had no terror for us, indeed, as we had been married but a few months, it appealed to us as a romantic wedding tour.[1]

So begins Catherine Haun's account of their nine-month journey from Iowa to California, just two of the quarter-million people who traveled across the continent on the Overland Trail in one of the world's great migrations. The migrants faced months of grueling struggle over badly marked routes that crossed swollen rivers, deserts, and mountains. The weather was often foul, with hailstorms, drenching rains, and burning summer temperatures. Graves along the route were a silent testimony to the lives claimed by buffalo stampedes, Indian skirmishes, cholera epidemics, and other disasters.

What inducements were so great as to make emigrants leave behind all that was familiar and risk their lives on an uncertain venture? Catherine Haun alludes to economic hard times gripping the country and to their hope for riches to be found in California. Like other migrants, the Hauns were attracted by the climate in the West, which was said to be always sunny and free of disease. Finally, like most who undertook the perilous journey west, the Hauns were young, moved by restlessness, a sense of adventure, and a belief that greater opportunities awaited in a new land. They, like their predecessors back to the beginnings of humankind, were acting in space and across space on the basis of acquired information and anticipation of opportunity—prepared to pay the price in time, money, and hardship costs of overcoming distance.

A fundamental question in human geography is: What considerations influence how individual human beings use space and act within it? Related queries include: Are there discernible controls on human spatial behavior? How does distance affect human interaction? How do our beliefs about places influence our spatial activities? How do we overcome the consequences of distance in the exchange of commodities and information? How are movement and migration decisions (like that of the Hauns) reached? How have new technologies enabled increased spatial interaction across great distances and contributed to globalization? These questions address geography's concern with understanding spatial interaction.

Spatial interaction is contact between places, and in human geography, means the movement of people, ideas, and commodities (goods bought and sold) from place to place. The Hauns were engaging in spatial interaction (**Figure 3.1**). International trade, the movement of semitrailers on the expressways, radio broadcasts, and business or personal telephone calls are other familiar examples. Such movements and exchanges are designed to achieve effective integration between different points of human activity. Movement and contact of whatever nature between places serve to smooth out the spatially differing availability of required resources, commodities, information, or opportunities. Whatever the particular purpose of a movement, there is inevitably some manner of trade-off balancing the benefit of the interaction with the costs that are incurred in overcoming spatial separation. Because commodity movements represent simple demonstrations of the principles underlying all spatial interactions, let us turn to them first.

Figure 3.1 A public bus negotiates a washed-out section of highway on one of the major routes connecting the capital city of Kathmandu with southern Nepal and India. Movement in Nepal is more difficult than in developed countries because of the limited road network, narrow, winding mountain roads, and frequent landslides. A ride on a public bus in Nepal can be an adventure in sharing space with people, agricultural produce, and livestock.

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3.1 Bases for Interaction

Neither the world's resources nor products are uniformly distributed. Commodity flows are responses to these differences; they are links between points of supply and locales of demand. Such response may not be immediate, or even direct. Factors such as the awareness of supplies or markets, the presence or absence of transportation connections, costs of movement, and the ability to pay for things wanted and needed—all that and more affect the structure of commodity exchange. Underlying these, however, is a basic set of controlling principles governing spatial interaction.

A Summarizing Model

Geographer Edward Ullman (1912–1976) speculated on the essential conditions affecting such interactions and proposed an explanatory model. He observed that spatial interaction is effectively controlled by three flow-determining factors that he called *complementarity, transferability,* and *intervening opportunity.* Although Ullman's model deals with commodity flows, it has—as we shall see—applicability to information transfers and human movements as well.

Complementarity

For two places to interact, one place must have what another place wants and can secure. That is, one place must have a supply

[1]From Catherine Haun, "A Woman's Trip Across the Plains in 1849," in Lillian Schlissel, *Women's Diaries of the Westward Journey* (New York: Schocken Books, 1982).

of an item for which there is an effective demand in the other, as evidenced by desire for the item, purchasing power to acquire it, and means to transport it. The word describing this circumstance is **complementarity.** Effective supply and demand are important considerations; mere differences from place to place in commodity surplus or deficit are not enough to initiate exchange. For example, Greenland and the Amazon basin are notably unlike in their natural resources and economies, but their amount of interaction is minimal. Supply and market must come together, as they do in the flow of seasonal fruits and vegetables from California's Imperial Valley to the urban markets of the American Midwest and East or in the movement of manganese from Ukraine to the steel mills of Western Europe. The massive movement of crude and refined petroleum clearly demonstrates complementarity in international trade (**Figure 3.2**). More generalized patterns of complementarity underlie the exchanges of the raw materials and agricultural goods of less developed countries for the money or industrial commodities of the developed states.

Transferability

Even when complementarity exists, spatial interaction occurs only when conditions of **transferability**—acceptable costs of an exchange—are met. Spatial movement responds not just to availability and demand but to considerations of time and cost. Transferability is an expression of the mobility of a commodity and is a function of three interrelated conditions: (1) the characteristics and value of the product; (2) the distance, measured in time and money penalties, over which it must be moved; and (3) the ability of the commodity to bear the costs of movement. If the time and money costs of traversing a distance are too great, exchange does not occur. That is, mobility is not just a physical matter but an economic one as well. If a given commodity is not affordable upon delivery to an otherwise willing buyer, it will not move in trade, and the potential buyer must seek a substitute or go without.

Transferability is not a constant condition. It differs between places over time, depending upon what is being transferred and how it is to be moved. In the 1820s, the newly opened Erie Canal cut shipping costs from Buffalo to New York City by 90 percent. However, the growth of railroads and highways across New York State provided quicker alternatives and caused great declines in commercial canal traffic during the early 20th century. More recently, containerized shipping has had a similar effect on the global shipments of goods. An increasing scarcity of high-quality ores will enhance the transferability of lower-quality mine outputs by increasing their value. Low-cost bulk commodities not economically moved by air may be fully transferable by rail or water. Poorly developed and costly transportation may inhibit exchanges even at short distance among otherwise willing traders. In short, transferability expresses the changing relationships between the costs of transportation and the value of the product to be shipped.

Intervening Opportunity

Complementarity can be effective only in the absence of more attractive alternative sources of supply or demand closer at hand or cheaper. **Intervening opportunities** serve to reduce supply/demand interactions that otherwise might develop between distant complementary areas. A supply of Saharan sand is not enough to assure its flow to sand-deficient Manhattan because

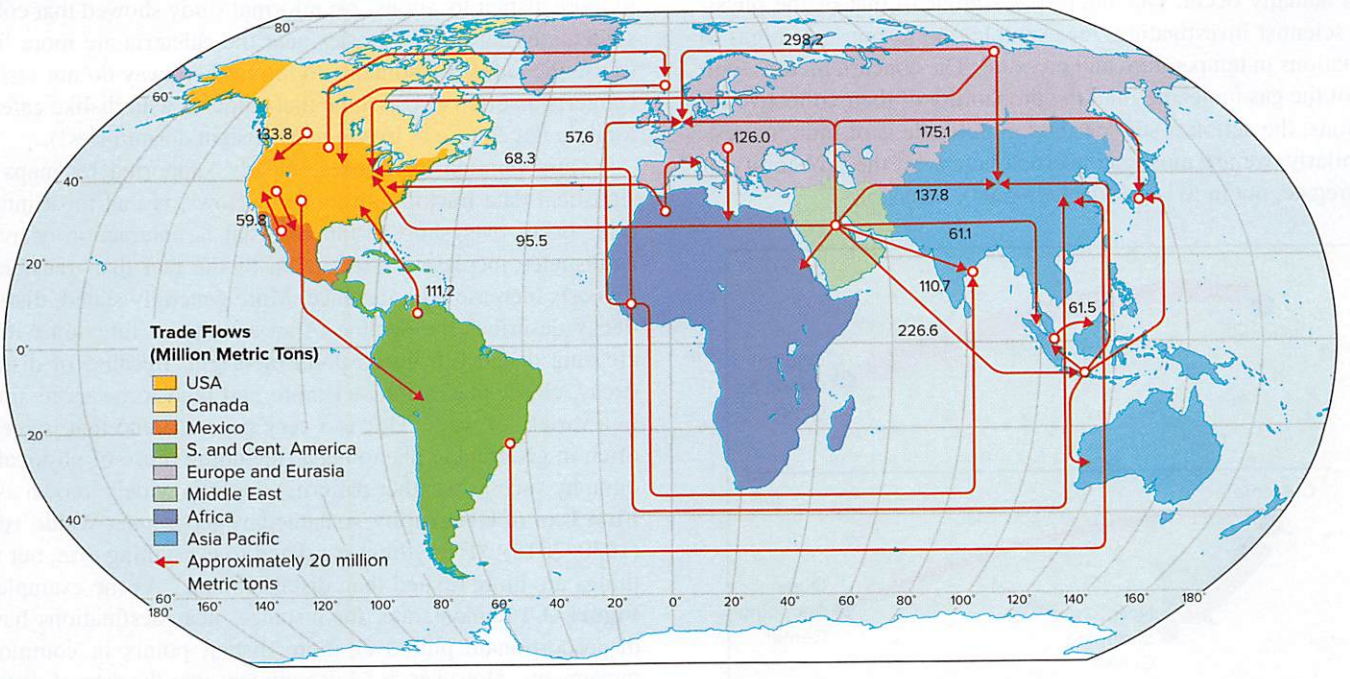


Figure 3.2 Major international crude oil and other product exports flow, 2007. Complementarity is so basic in initiating interaction that even relatively low-value bulk commodities such as coal, fertilizer, and grain move in trade over long distances. For many years, despite fluctuating prices, petroleum has been the most important commodity in international trade, moving long distances in response to effective supply and demand considerations.

Source: Adapted from The BP Amoco Statistical Review of World Energy, *2008.*

supplies of sand are more easily and cheaply available within the New York metropolitan region. For reasons of cost and convenience, a purchaser is unlikely to buy identical commodities at a distance when a suitable nearby supply is available. When it is, the intervening opportunity demonstrates complementarity at a shorter distance.

Similarly, markets and destinations are sought, if possible, close at hand. Growing metropolitan demand in California reduces the importance of Midwestern markets for western fruit growers. The intervening opportunities offered by Chicago or Philadelphia reduce the number of job seekers from Iowa searching for employment in New York City. People from New England are more likely to take winter vacations in Florida, which is relatively near and accessible, than in Southern California, which is not. That is, opportunities that are discerned closer at hand reduce the pull of opportunities offered by a distant destination (**Figure 3.3**). Patterns of spatial interaction are dynamic, reflecting the changeable structure of apparent opportunity.

Measuring Interaction

Complementarity, transferability, and intervening opportunity—the controlling conditions of commodity movement—help us understand all forms of spatial interaction, including choosing a restaurant, where to go to college, or where to buy a house—even the once-in-a-lifetime transcontinental adventure of the Hauns. The study of unique spatial interactions, such as the discovery of an Inuit carving in a Miami gift shop, is interesting but does not establish general patterns. In this chapter, we focus on general principles that govern the frequency and intensity of interaction both to validate the three preconditions of spatial exchange and to establish the probability that any given potential interaction will actually occur. Our interest is similar to that of the physical scientist investigating, for example, the response of a gas to variations in temperature and pressure. The concern there is with all of the gas molecules and the probability of their collective reactions; the action of any particular molecule is of little interest. Similarly, we are mostly concerned here with the probability of aggregate, not individual (disaggregate), behavior.

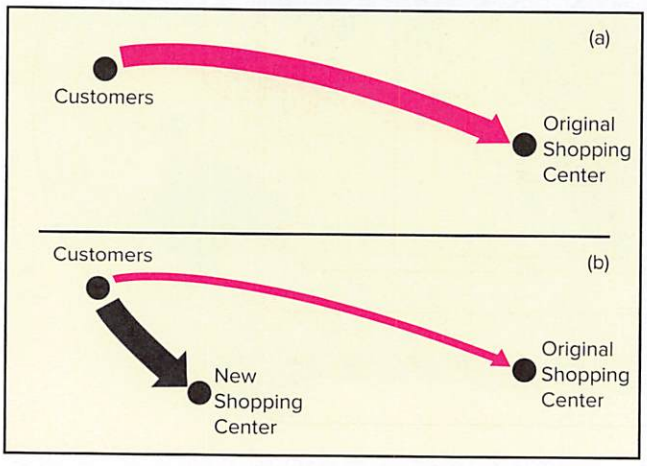


Figure 3.3 (*a*) The volume of expected customers for a shopping mall based solely on their complementarity and distance apart, may be (*b*) reduced if a new mall opens as an intervening opportunity nearer to the customers.

That concern with aggregate behavior conceals or ignores a great deal of spatial interaction of vital importance both in the real world and in human geography. Most theoretical and observational studies of spatial interaction have focused on the standard normative spatial behavior of fully physically and economically capable Western-culture adults. That standard does not address the individual or collective spatial problems and actions of such others as children, the poor, the elderly, the disabled, or socially disadvantaged individuals or groups, nor does it recognize the very real, though often subtle, differences between male and female spatial action responses and decisions. Our orientation to the North American culture realm means also that the aggregate spatial behavioral norms that we discern there fail to recognize the many and varied sociocultural, economic, legal, and similar constraints on spatial behavior operative in other culture areas of the world. Nevertheless, observational evidence suggests that the same basic influences on personal spatial behavior that we recognize here have universal applicability, despite their inevitable modification in different contexts.

Distance Decay

In all manner of ways, the lives and activities of people everywhere are influenced by the **friction of distance.** That phrase reminds us that distance has a retarding effect on human interaction because there are increasing penalties in time and cost associated with longer-distance, more expensive interchanges. We visit nearby friends more often than distant friends; we go more frequently to the neighborhood convenience store cluster than to the farther regional shopping center. Telephone calls or mail deliveries between nearby towns are greater in volume than those to more distant locations. An informal study showed that college students living in dormitories near the cafeteria are more likely to use the cafeteria; students living farther away do not visit the cafeteria as often (we assume that students who dislike cafeteria food do not choose to live in more distant dormitories!).

Our common experience, clearly supported by maps and statistical data tracking all kinds of flows, is that most interactions occur over short distances. That is, interaction decreases as distance increases, a reflection of the fact that transferability costs increase with distance. More generally stated, **distance decay** describes the decline of an activity or function with increasing distance from its point of origin. Because of distance decay, closer places interact more and tend to be more similar in a variety of ways. This is a very general trend that is seen so often in geographic phenomena (including those of physical geography such as weather patterns) that it is widely known as the **First Law of Geography,** so named by geographer Waldo Tobler (1930–2018): "Everything is related to everything else, but near things are more related than distant things." As the examples in **Figure 3.4** demonstrate, for instance, near destinations have a disproportionate pull over more distant points in commodity movements. However, it is also evident that the rate of distance decay varies with the type of activity. It usually declines nonlinearly at a decelerating rate so that the reduction is fastest at close distances, reducing more and more slowly as one gets farther and farther away. Thus, the amount of interaction between two points

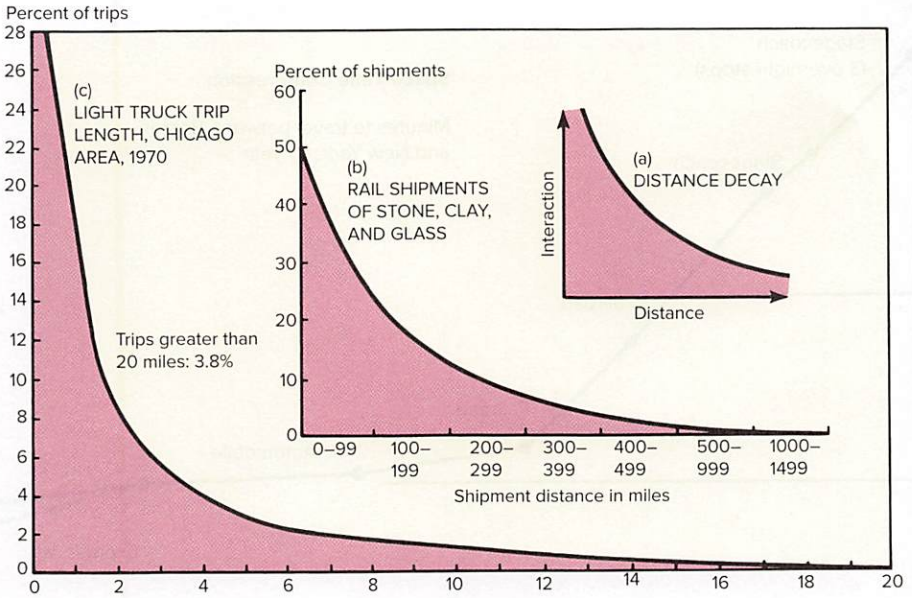


Figure 3.4 The shape of distance decay. The geographer Waldo Tobler summarized the concept of distance decay in proposing his First Law of Geography: "Everything is related to everything else, but near things are more related than distant things." Distance decay curves vary with the type of flow. Graph *(a)* is a generalized statement of distance decay, *(b)* summarizes U.S. data for a single year, and *(c)* suggests the primary use of light trucks as short-haul pickup and delivery vehicles.

Source: (c) Data from Chicago Area Transportation Study, A Summary of Travel Characteristics, *1977.*

80 kilometers (50 miles) apart would usually be less than half that between points 40 kilometers (25 miles) apart, rather than exactly one half. It is also interesting to note that while distance decay in human geography occurs primarily because of the extra "cost" caused by the friction of distance, just as in other areas of geography, other factors can contribute to declining interaction in economic or social contexts, such as declining familiarity and interest with increasing distance.

When the friction of distance is reduced by lowered costs or increased ease of flow, the slope of the distance decay curve is flattened and more total area is effectively united than when those costs are high. This, of course, is the phenomenon of **space-time compression** (convergence) that we introduced in Chapter 2 (**Figure 3.5**). When automobiles and expressways became widely available in the second half of the 20th century, U.S. cities underwent massive geographic expansion as the friction of distance was sharply reduced and large areas of rural land were brought within a reasonable commute time from the city. Figure 3.4 shows that distance decay is evident for both truck and rail shipments, but that the more expensive mode (trucking) is typically used for shorter distances.

The Gravity Concept

Interaction decisions are not based on distance or distance/cost considerations alone. The large regional shopping center attracts customers from a wide radius because of the variety of shops and goods its very size promises. We go to distant big cities "to seek our fortune," rather than to the nearer small town. That is, we are attracted by the expectation of opportunity that we associate with larger rather than smaller places. That expectation is summarized by another model of spatial interaction, the **gravity model,** also drawn from the physical sciences.

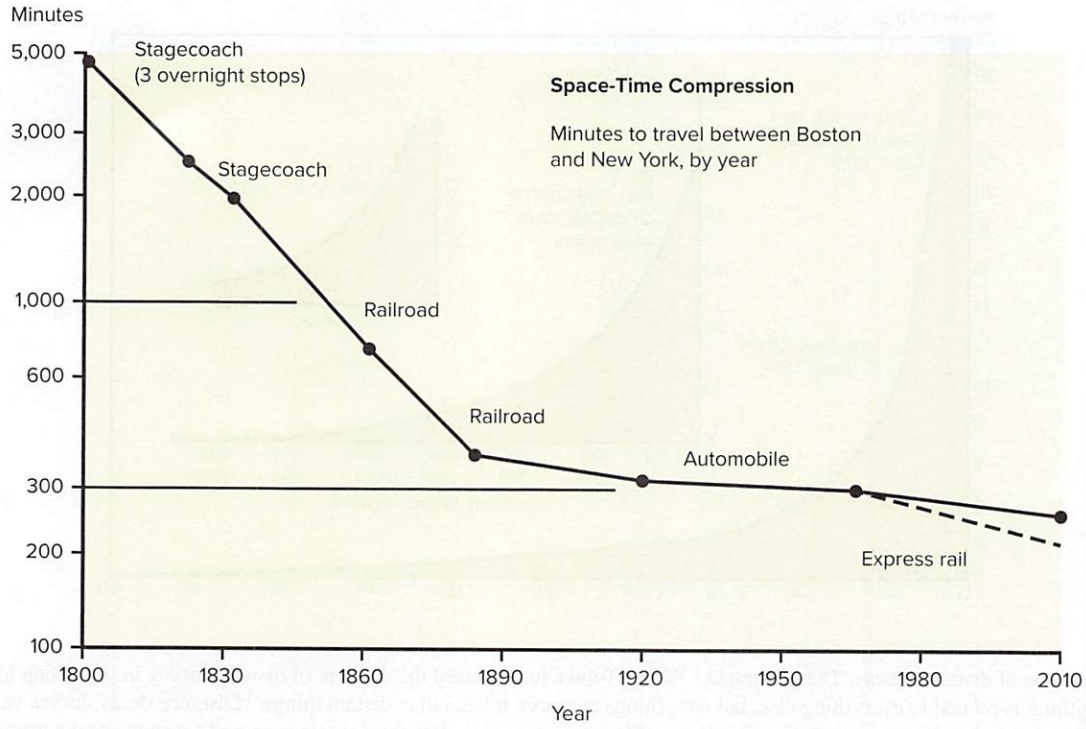
In the 1850s, Henry C. Carey (1793–1879), in his *Principles of Social Science,* observed that the physical laws of gravity and motion developed by Sir Isaac Newton (1642–1727) were applicable to the aggregate actions of humans. Newton's law of universal gravitation states that the gravitational pull between any two objects is proportional to the product of their masses and inversely proportional to the square of the distance between them. More simply put, Newton's law tells us that big things have a stronger attraction force (greater gravitational pull) than do small objects, and that things close to each other have stronger mutual attraction than do objects at greater distance—and that the attraction decreases very rapidly with even small increases in separation. Here is Newton's law of physical gravity:

$$F_{ij} = g\frac{M_i M_j}{d_{ij}^2}.$$

This equation states that the amount of gravitational force between two bodies *i* and *j* equals the product of their masses, divided by the square of the distance between them, and multiplied by the gravitational constant. By analogy, Carey's law of social gravity is

$$I_{ij} = k\frac{P_i P_j}{D_{ij}^B}.$$

This equation states that the amount of interaction (frequency or rate) between two places *i* and *j* equals the product of



AP Figure 3.5 Space-time compression is clearly shown in this plot of travel time between the U.S. cities of Boston and New York, from the year 1800 to the year 2010, resulting from improvements to transportation technologies and infrastructure.

Source: Donald G. Janelle, UCSB.

their "interaction masses," divided by the distance between them raised to some exponent, and multiplied by the interaction constant. Notice some differences between the physical and social laws. Unlike the physical law, the mass of a place in the social law is expressed in terms of some measure of how attractive the place is to interaction; population is often used, as suggested by the letter *P,* but many other measures are possible, such as size, social status, the diversity of commodities offered, and so on (for instance, one might prefer to go to a shopping center with more different stores). Importantly, distance may not be straight-line physical distance but some other measure of physical separation, such as distance along the roads connecting places (*route distance*). Alternatively, it is often more relevant to express distance in nonspatial terms, such as travel time, cost, or effort (for most of us, walking downhill is more alluring than walking uphill). Unlike in physical gravity, where the force of attraction declines as the square of distance (the *inverse-square law*), in social gravity, the force of interaction attraction declines at somewhat different rates depending on the domain of interaction (visiting a friend versus visiting a relative, for instance, or shopping for bread versus shopping for caviar). In many domains, the distance exponent is a fractional number (but almost always greater than 1). Finally, social gravity requires multiplication by a constant at the end just like physical gravity does. However, this social "constant" is actually variable across interaction domains, and unlike the *g* in physical gravity that represents something profound about the nature of the physical world, the *k* in social gravity is probably best thought of as just a mathematical way to get the interaction numbers to work out properly as the output of the equation.

Carey's second observation—that large cities have greater drawing power for individuals than do small ones—was subsequently addressed by the **law of retail gravitation,** proposed by William J. Reilly (1899–1970) in 1931. Using the population and distance inputs of the gravity model, Reilly determined the breaking-point (BP) location between two towns where one would expect to find the boundary separating the market areas of the two towns. The market areas are functional regions for each town that enclose the area where each town exerts controlling influence over retail trade; beyond that boundary, the other town dominates. Residents within a town's market area will likely travel to that town to shop. **Reilly's Breaking-Point Law** is:

$$BP_{(\text{from i})} = \frac{D_{ij}}{1 + \sqrt{\frac{P_j}{P_i}}}.$$

This equation states that the BP location (the market area boundary) between two towns *i* and *j*—expressed as distance from town *i,* equals the distance between the two towns divided by 1, plus the square root of the population of town *j* divided by the population of town *i.* As with all social gravity models, distance may be measured as various forms of physical or nonphysical separation. Because the breaking point between cities of unequal size will lie farther from the larger of the two, its spatially greater drawing power is captured (**Figure 3.6**).

Later studies in location theory, city systems, trade area analysis, and other social topics all suggest that the gravity

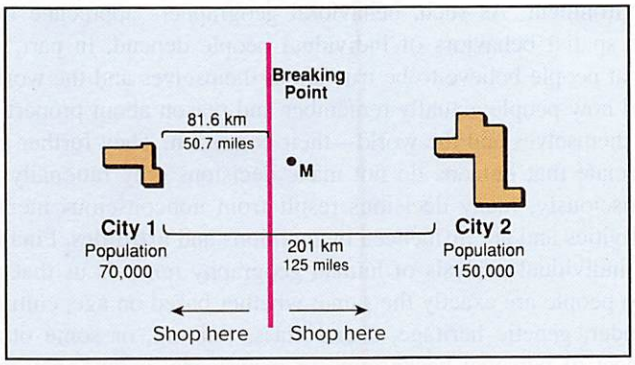


Figure 3.6 The *law of retail gravitation* provides a quick determination of the trade boundary (or breaking point) between two cities. In the diagram, Cities 1 and 2 are 201 kilometers (125 miles) apart. Reilly's law tells us that the breaking point between them lies 81.6 kilometers (50.7 miles) distant from City 1. A potential customer located at *M*, midway (100.5 km or 62.5 mi) between the cities, would lie well within the trade zone of City 2. A series of such calculations would define the "trade area" of any single city.

model can be used to account for a wide variety of interaction flow patterns in human geography, including population migration, commodity flows, journeys to work or to shop, telephone call volumes, and the like. Each flow pattern suggests that size as well as distance influences spatial interaction. Carey's observation, made some 150 years ago, initiated a type of analysis that in modified form is used today for a variety of practical studies that help us better understand the *friction of distance*.

Interaction Potential

The spatial interaction models of distance decay and gravitational pull we have considered thus far deal with only two places at a time. The world of reality is rather more complex. All cities, not just city pairs, within a regional system of cities have the possibility of interacting with one another. Indeed, the more specialized the goods produced in each separate center—that is, the greater their collective complementarity—the more likely it is that such multiple interactions will occur. Similarly, shoppers often have more than two stores or shopping centers to choose from on any given shopping trip.

A **potential model,** also based on the principles of social gravity, provides an estimate of the interaction opportunities available to a center in such a multicentered network. It tells us the relative interaction pull of each point in relation to all other places within a region. It does so by summing the interaction attractiveness and distance relationships between all points of potential interaction within an area. The concept of potential is applicable whenever the measurement of the intensity of spatial interaction is of concern—as it is in studies of retail behavior, marketing, land values, broadcasting, commuting patterns, and the like.

Movement Biases

Distance decay and the gravity models help us understand the bases for interaction in an idealized area without natural or cultural barriers to movement or restrictions on routes followed, and in which only rational interaction decisions are made. Even under those model conditions, the pattern of spatial interaction that develops for whatever reason inevitably affects the conditions under which future interactions will occur. An initial structure of centers and connecting flows will tend to freeze into the landscape a mutually reinforcing continuation of that same pattern. The predictable flows of shoppers to existing shopping centers make those centers attractive to other merchants. New store openings increase customer flow; increased flow strengthens the developed pattern of spatial interaction. And increased road traffic calls for the highway improvement that encourages additional traffic volume.

Such an aggregate regularity of flow is called a **movement bias.** We have already noted a distance bias that favors short movements over long ones. There is also direction bias, in which of all possible directions of movement, actual flows are restricted to only one or a few. Direction bias is simply a statement that from a given origin, flows are not random (**Figure 3.7**); rather, certain places have a greater attraction than do others. The movement patterns from an isolated farmstead are likely oriented to a favored shopping town. On a larger scale, in North America or

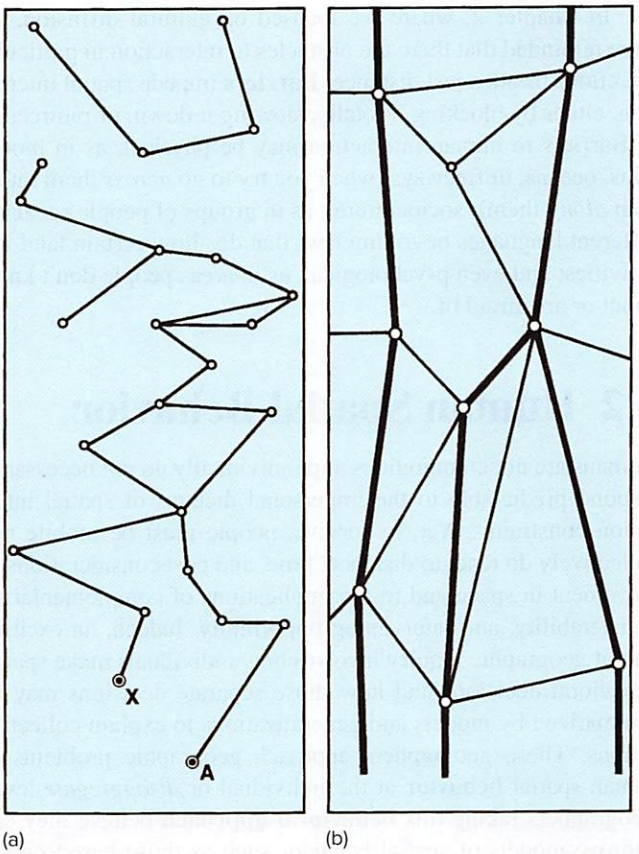


Figure 3.7 Direction bias. (*a*) When direction bias is absent, movements tend to be almost random, occurring in all possible directions, but less likely between points, such as *A* and *X*, that are not directly connected. (*b*) Direction bias indicating predominantly north-south movements, likely as a result of transportation routes and/or major destinations being aligned north to south.

Siberia, long-distance freight movements are directionally biased in favor of east-west flows. Direction bias is reflected in not just the orientation but also the intensity of flow. Movements from a single point—from Novosibirsk in Siberia, for example, or from Winnipeg, Canada, or Kansas City in the United States—may occur in all directions; they are in reality more intense along the east-west axis, in part because of the primary landmass orientations of these large countries.

Such directional biases are in part a reflection of **network bias,** a shorthand way of saying that the presence or absence of connecting channels strongly affects the likelihood that spatial interaction, including transportation and communication, will occur. A set of routes and the places that they connect are collectively called a **network;** in abstract terms, the places are called **nodes** and the connecting routes are called **links.** Networks facilitate spatial interaction along their links and between nodes they directly connect. Flows cannot occur between all nodes if not all nodes are linked, at least indirectly. In Figure 3.6a, the interchange between *A* and *X,* though not necessarily impossible, is unlikely because the route between them is indirect and circuitous. In information flows, a worker on the assembly line is less likely to know of company production plans than is a secretary in the executive offices; these two workers are tied into quite different information networks.

In Chapter 2, where we focused on cultural diffusion, we were reminded that there are obstacles to interaction in particular directions besides just distance. **Barriers** impede spatial interaction, either by blocking it totally, slowing it down, or redirecting it. Barriers to human interaction may be physical, as in mountains, oceans, or freeways (when you try to go *across* them rather than *along* them); sociocultural, as in groups of people speaking different languages or zoning laws that disallow certain land-use activities; and even psychological, as in areas people don't know about or are afraid of.

3.2 Human Spatial Behavior

Humans are not commodities and individually do not necessarily respond predictably to the impersonal dictates of spatial interaction constraints. Yet, to survive, people must be mobile and collectively do react to distance, time, and cost considerations of movement in space and to the implications of complementarity, transferability, and intervening opportunity. Indeed, an exciting line of geographic inquiry involves how individuals make spatial behavioral decisions and how those separate decisions may be summarized by models and generalizations to explain collective actions. These geographers approach geographic problems of human spatial **behavior** at the individual or *disaggregate* level. Geographers taking this **behavioral approach** believe they can improve models of spatial behavior such as those based on social gravity or economic rationality (see Chapter 10) by learning more about the way people actually make decisions about where and how to travel and perform other geographic acts. They also recognize that problems involving the psychology of place, space, and environment are geographic problems in their own right because geographers study all aspects of space, place, and environment. As such, behavioral geographers appreciate that the spatial behaviors of individual people depend, in part, on what people believe to be true about themselves and the world, and how people actually remember and reason about properties of themselves and the world—their **cognition.** They further appreciate that humans do not make decisions only rationally or consciously; many decisions result from nonconscious mental activities and are influenced by emotions and **attitudes.** Finally, an individual analysis of human geography reminds us that no two people are exactly the same; whether based on age, culture, gender, genetic heritage, social class, training, or some other aspect of personal background or experience, people may differ somewhat in their geographic behavior. Models that treat all people as identical are oversimplifications, according to this approach.

Mobility is the general term applied to all types of human movement through space and time. Two aspects of that mobility behavior concern us. The first is the daily or temporary use of space—the journeys to stores, to work, or to school, or for longer periods on vacation or visiting friends and relatives. These types of mobility are often designated as **temporary travel** and have no suggestion of relocation of residence (**Figure 3.8**); people intend to return home after such trips, if not the same day, then relatively soon thereafter. The second type of mobility is the longer-term commitment related to decisions to leave the home territory permanently and find residence in a new location (residential relocation). This second form of spatial behavior is termed **migration.** The distinction between temporary travel and migration is important to a geographic analysis of spatial mobility and is usually fairly clear, but there are ambiguous cases. College students "migrate" to their campus housing from home but may return to that home every summer and after they graduate. Seasonal farm workers may be away from their home for much of the year, following the ripening fruits and vegetables, only to return home at the end of the harvest season. Refugees forced out of their home may intend to return when political, economic, or environmental conditions (see below) permit, but

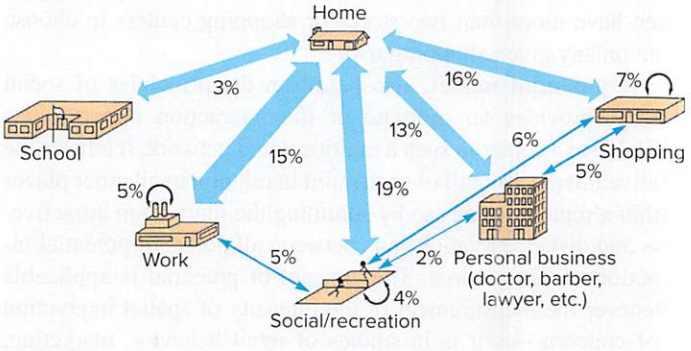


Figure 3.8 Seven County Minneapolis–St. Paul Metropolitan Area travel patterns. The numbers are the percentage of all urban trips taken on a typical weekday. In recent decades, the relative importance of work and school trips has decreased, while other types of trips have risen in importance.

Source: Data from Metropolitan Council: The 2000 Travel Behavior Inventory.

for many of these forced migrants, that time never comes. And of course, nomadic people permanently live in temporary housing that moves with them in a never-ending cycle of residential mobility.

Both aspects of temporary and permanent mobility imply a time dimension. Humans' spatial actions are not instantaneous, even with improvements to transportation technologies. They operate over time, frequently imparting a rhythm to individual and group activity patterns and imposing choices among time-consuming behaviors. Elements of both aspects of human spatial behavior are also embodied in how individuals conceive of space and act within it, and how they respond to information affecting their space-behavioral decisions. The nature of those cognitions and responses affect us all in our daily movements. The more permanent movement embodied in migration involves additional and less common decisions and behaviors, as we shall see later in this chapter.

3.3 Individual Activity Space

One of the realities of life is that groups and countries draw boundaries around themselves and divide space into territories that are, if necessary, defended. Some see the concept of **territoriality**—the emotional attachment to and the defense of home ground—as a root explanation of much of human action and response. It is true that some individual and collective activity appears to be governed by territorial defense responses: the conflict between street groups in claiming and protecting their "turf" (and their fear for their lives when venturing beyond it) and the sometimes violent rejection by an ethnic urban neighborhood of any different advancing population group that it considers threatening. On a more individualized basis, each of us claims as **personal space** the zone of privacy and separation from others that our culture or our physical circumstances require or permit. Anglo Americans strive for greater face-to-face separation in conversations than do Latin Americans. Personal space on a crowded beach or in a department store is acceptably more limited than it is in our homes or when we are studying in a library (**Figure 3.9**).

For most of us, our personal sense of territoriality is a tempered one. We regard our homes and property as defensible private domains but open them to innocent visitors, known and unknown, or to those on private or official business. Nor do we confine our activities so exclusively within controlled home territories as street-gang members do within theirs. Rather, we have a more or less extended home range, an **activity space** or area within which we typically move freely on our rounds of regular activity, sharing that space with others who are also about their daily affairs. **Figure 3.10** depicts activity spaces for a suburban family of five for an average weekday. Note that the activity space is different for each individual.

The types of trips that individuals make, and thus the extent of their activity space, depend on at least three interrelated variables: their stage in life course; the means of mobility at their command; and the demands or opportunities implicit in their daily activities. The first variable, stage in life, refers to membership in specific age groups. School-age children usually travel short distances to lower schools and longer distances to upper-level schools. After-school activities tend to be limited to walking or to bicycle trips to nearby locations. Greater mobility is characteristic of high-school students. Adults responsible for household duties make shopping trips and trips related to child care, as well as journeys away from home for social, cultural,

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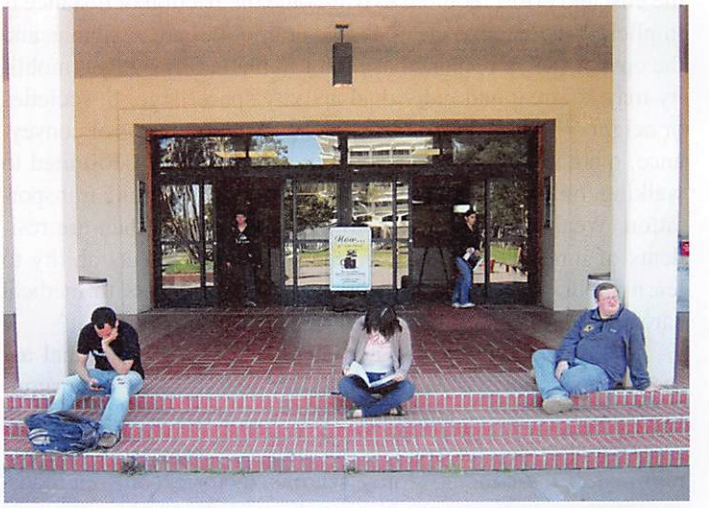


(b)

Figure 3.9 Our demanded *personal space* is not necessarily uniform in shape or constant in size. We tolerate strangers closer to our sides than directly in front of us; we accept more crowding in an elevator than in a store. We accept the press of the crowd on a popular beach *(a)*—as do these students on spring break in the Florida Keys *(b)*, but tend to distance ourselves from others in a public square.

(a) ©McGraw-Hill Higher Education; (b) ©Daniel Montello

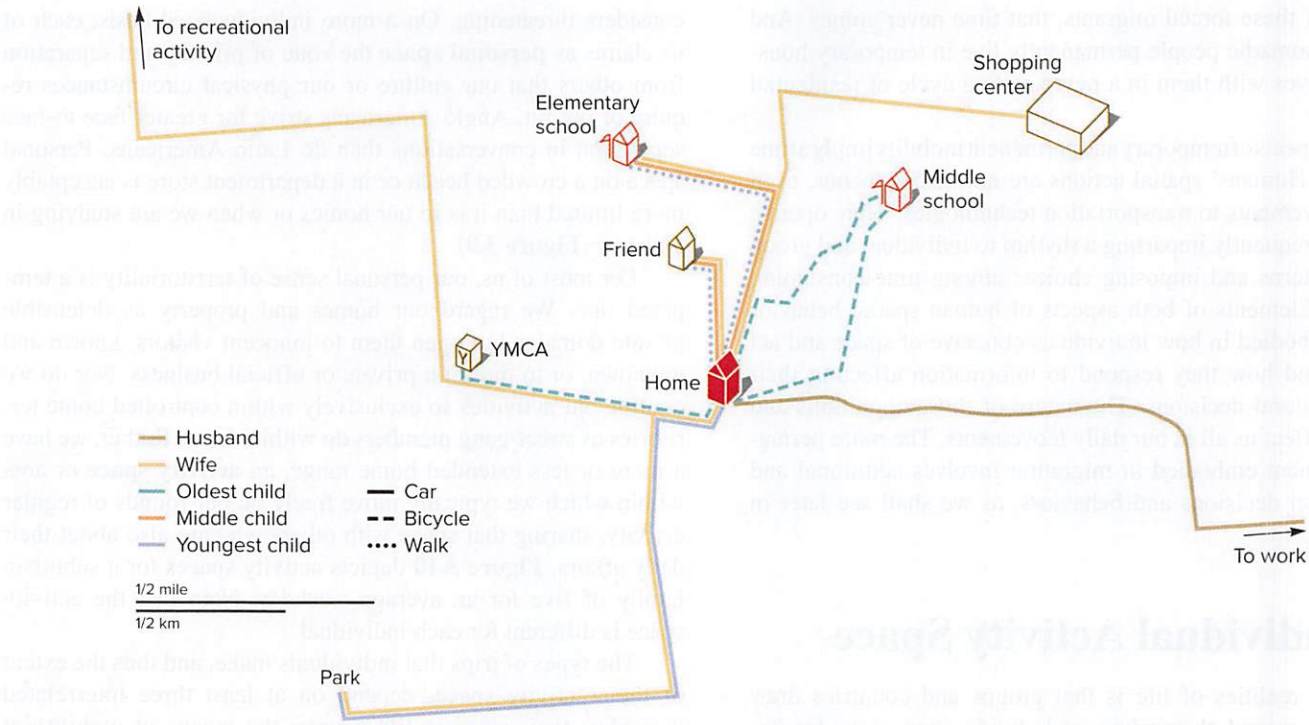


Figure 3.10 Activity space for each member of a family of five for a typical weekday. Routes of regular movement and areas recurrently visited help to foster a sense of territoriality and to affect one's cognitions of space.

or recreational purposes. Wage-earning adults usually travel farther from home than other family members. Elderly people may, through infirmity or interests, have less extensive activity spaces.

The second variable that affects the extent of activity space is mobility, or the ability to travel. An informal consideration of the cost and effort required to overcome the friction of distance is implicit. Where incomes are high, automobiles are available, and the cost of fuel is reckoned as minor in the family budget, mobility may be great and individual activity space large. In societies or neighborhoods where cars are not a standard means of conveyance, the daily non-emergency activity space may be limited to walking, bicycling, or taking infrequent trips on public transportation. Wealthy suburbanites are far more mobile than are residents of inner-city slums, a circumstance that affects ability to learn about, seek, or retain work and to have access to medical care, educational facilities, and social services.

A third factor limiting activity space is the individual assessment of the existence of possible activities or opportunities. In subsistence economies where the needs of daily life are satisfied at home, the impetus for journeys away from home is minimal. If there are no stores, schools, factories, or even roads, expectations and opportunities are limited. Not only are activities spatially restricted, but **awareness space**—knowledge of opportunity locations beyond normal activity space—is minimal, distorted, or absent. In low-income neighborhoods of modern cities in any country, poverty and isolation limit the inducements, opportunities, destinations, and necessity of travel (Figure 1.28). Opportunities plus mobility conditioned by life stage bear heavily on the amount of spatial interaction in which individuals engage.

3.4 The Tyranny of Time

Whatever their activity, people are always located somewhere. Furthermore, they are always located somewhere at some time of the day or night, and they spend various periods of time at each location before moving through space and time to new locations. The study of the temporal characteristics of activities in conjunction with their spatial characteristics is known as **time geography.** We can depict this by drawing a graph that shows activity locations and movements around the landscape plotted against time on the vertical axis. This graph of a person's activity locations at certain times is a **space-time path.** Figure 3.11 shows a daily space-time path, but weekly, yearly, or even lifetime paths are possible. Whatever the temporal scale, space-time paths are notable for their tendency to show cyclic, nonrandom patterns of recurring activity locations at particular times, such as daily or seasonal patterns.

The activities of humans—eating, sleeping, traveling between home and destination, working, or attending classes—all consume time and involve space. An individual's spatial reach is restricted because one cannot be in two different places at the

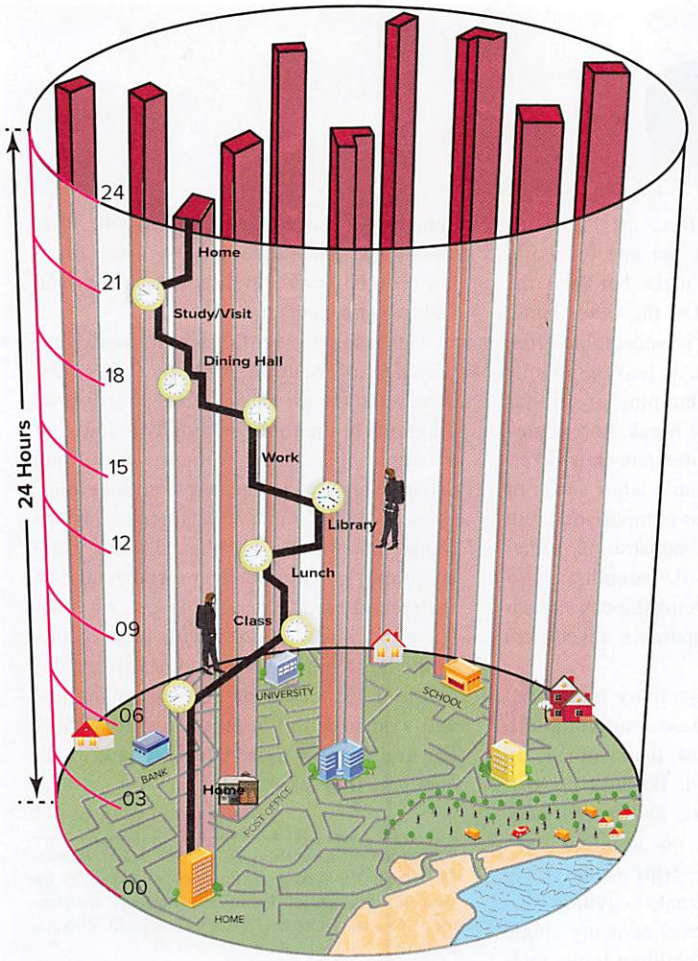


Figure 3.11 The school-day space-time path for a hypothetical college student. Vertical segments are times when the student stays in the same place for some time. Sloped segments indicate movement—changes of location over time. Shallower lines show faster travel.

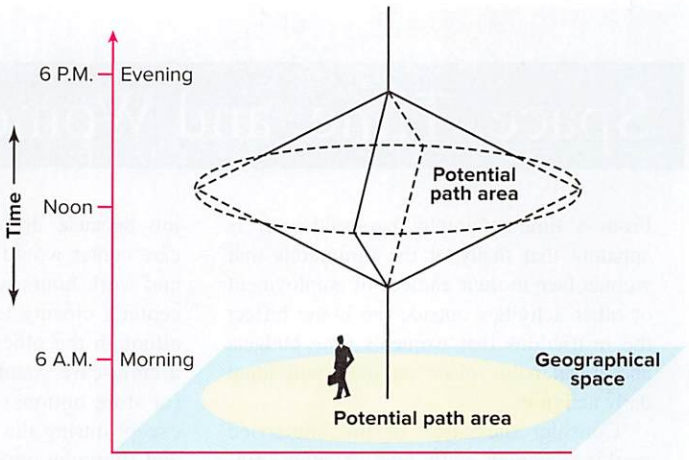


Figure 3.12 The space-time prism. An individual's daily prism has both geographical limits and totally surrounding space-time walls. The *time* (vertical axis) involved in movement affects the space that is accessible, along with the time and space available for other purposes than travel. If we can travel only slowly, such as by walking, we will not be able to move as far from home each day or have as much time available for other activities besides travel. This is suggested by steeper sides on our prism. If we can travel more quickly, such as by driving, we will be able to move farther from home each day and have more time available for other activities. This is suggested by prisms with shallower sides.

same moment or engage simultaneously in activities that are spatially separate. Further, because there is a finite amount of time within a day and each of us is biologically bound to a daily rhythm of day and night, sleeping and eating, time tyrannically limits the spatial choices we can make and the activity space that we can command.

The daily space-time constraints of our time geography may be represented by a **space-time prism,** the volume of space and length of time within which our activities must be confined. Its size and shape are determined by our mobility and our locational responsibilities; its boundaries define what we can or cannot accomplish spatially and temporally (**Figure 3.12**). If our circumstances demand that we walk to work or school, the sides of our prism are steep and the space available for our activities is narrow; steep diagonals mean slow travel and indicate that we cannot go as far in a given time period. We cannot use time spent in transit for most other activities, and the area reasonably accessible to the pedestrian is limited. The space-time prism for the driver has more shallow-angled sides and the individual's spatial range is wide; shallow diagonals mean rapid travel and indicate that we can go farther in a given time period. The area of the prism determines what spatially defined activities are possible, for no activity can exceed the bounds of the prism (see the feature "Space, Time, and Women"). That is, space-time paths are constrained to fit within space-time prisms. Because most activities have their own time constraints, the choices of things you can do and the places in which you can do them are strictly limited. Scheduled class hours, travel time from residence to campus, and dining hall location and opening and closing hours, for example, may be the constraints on your space-time path. If you also need part-time work, your choice of jobs is restricted by their respective locations and work hours, for the job, too, must fit within your daily space-time prism. Parenting responsibilities, particularly for single parents, place major constraints on the spatial range of individuals. In households where one partner (typically the woman) bears greater responsibilities for childcare and household chores, their job choices may be limited by their narrow time-geographic constraints, and they may be forced to accept lower pay and/or a less prestigious job. In other words, all people have *space-time budgets* that dictate how far they can travel in a given time period. Geographers apply the study of these space-time budgets and other aspects of time geography to problems such as traffic control, mass transit, and highway and parking structure design.

Space, Time, and Women

From a time-geography perspective, it is apparent that many of the limitations that women face in their choices of employment or other activities outside the home reflect the restrictions that women's time budgets and travel paths place on their individual daily activities.

Consider the case* of the unmarried working woman with one or more preschool-age children. The location and operating hours of available child-care facilities may have more of an influence on her choice of job than do her labor skills or the relative merits of alternative employment opportunities. For example, the woman may not be able to leave her home before a given hour because the only full-day child-care service available to her is not open earlier. She must return at a specified time to pick up her child and arrive home to prepare food at a reasonable (for the child) dinner time. Her travel mode and speed determine the outer limits of her daily space-time prism.

Suppose both of two solid job offers have the same working hours and fall within her possible activity space. She cannot accept the preferred, better-paying job because drop-off time at the child-care center would make her late for work, and work hours would make her miss the center's closing time. On the other hand, although the other job is acceptable from a child-care standpoint, it leaves no time (or store options) for shopping or errands except during the lunch break. Job choice and shopping opportunities are thus determined not by the woman's labor skills or awareness of store price comparisons, but by her time-geography constraints. Other women in other job skill, parenthood, locational, or mobility circumstances experience different but comparable space-path restrictions.

Mobility is a key to activity mix, time-budget, and activity space configurations. Again, research indicates that women are frequently disadvantaged. Because of their multiple work, child-care, and home maintenance tasks, women on average make more—though shorter—trips than men, leaving less time for alternate activities.

The lower income level of many single women with or without children limits their ability to own cars and leads them to use public transit disproportionately to their numbers—to the detriment of both their money and time-space budgets. They are, it has been observed, "transportation deprived and transit dependent."

Geographer Mei-Po Kwan used geographic information system (GIS) and travel diaries to create three-dimensional diagrams of the time-geography patterns of a sample of men and women who all had driver's licenses and access to automobiles. Despite their relative affluence, Kwan found that women experience more time-geography constraints than men because of their child-care, school drop-off, or other responsibilities. Women with other adults in the household to share domestic responsibilities experienced fewer constraints, and women with the most time-geography constraints were more likely to have to accept part-time work.

*Suggested by Risa Palm and Allan Pred, "A Time-Geographic Perspective on Problems of Inequality for Women," Institute of Urban and Regional Development, Working Paper No. 236, University of California, Berkeley, 1974.

Source: *Mei-Po Kwan, 1999. "Gender, the Home-Work Link, and Space-Time Patterns of Non-Employment Activities,"* Economic Geography, *75(4): 370–394 (1999).*

3.5 Distance and Human Interaction

People make many more short-distance trips than long ones, a statement in human behavioral terms of the concept of distance decay. If we drew a boundary line around our activity space, it would be evident that trips to the boundary are taken much less often than short-distance trips around the home. The tendency is for the frequency of trips to fall off very rapidly beyond an individual's **critical distance**—the distance beyond which cost, effort, and means strongly influence our willingness to travel. **Figure 3.13** illustrates the point with regard to journeys from the homesite.

Regular movements defining our individual activity space are undertaken for different purposes and are differently influenced by time and distance considerations. The kinds of activities that individuals engage in can be classified according to type of trip: journeys to work, to school, to shop, for recreation, and so on. People in nearly all parts of the world make these same types of journeys, though the spatially variable requirements of culture, economy, and personal circumstance dictate their frequency, duration, and

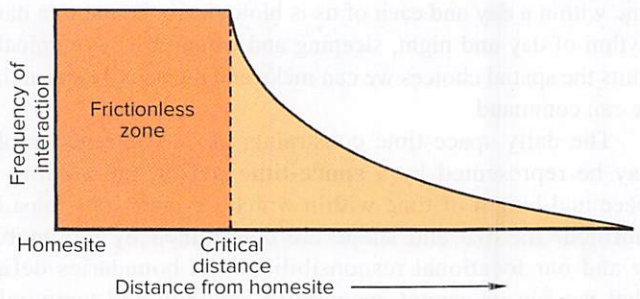


Figure 3.13 Critical distance. This general diagram indicates how most people observe distance. For each activity, there is a distance beyond which the intensity of contact declines. This is called the *critical distance*. The distance up to the critical distance is identified as a *frictionless zone,* in which time or distance considerations do not effectively figure in the decision to take the trip.

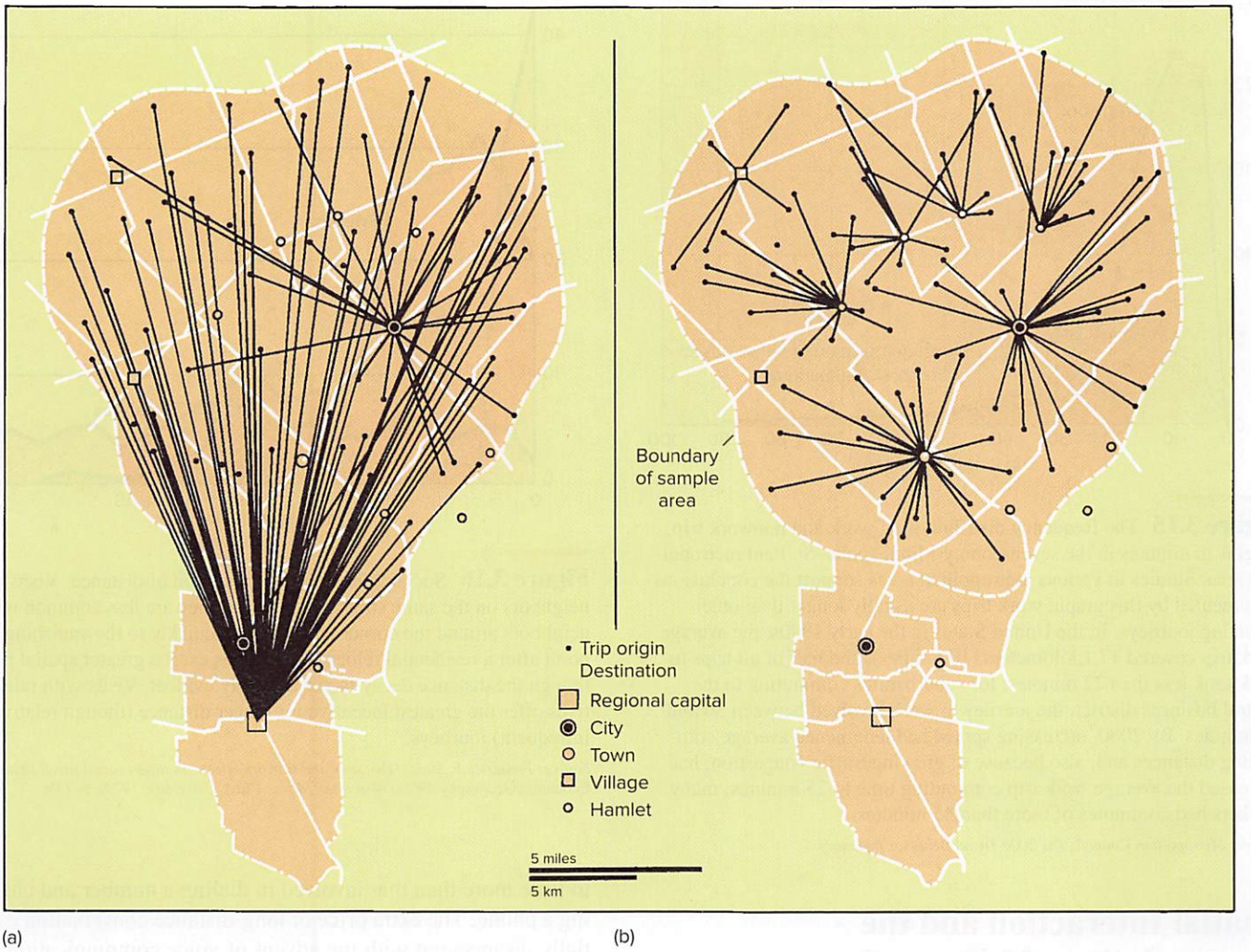


Figure 3.14 Travel patterns for purchases of clothing and yard goods of (*a*) rural cash-economy Canadians and (*b*) Canadians of the Old Order Mennonite sect. These strikingly different travel behaviors mapped many years ago in central Canada demonstrate the great differences that may exist in the action spaces of different culture groups occupying the same territory. At that time, "modern" rural Canadians, owning cars and wishing to take advantage of the variety of goods offered in the more distant regional capital, were willing and able to travel longer distances than were neighboring people of a traditionalist culture who had different mobility and whose different demands in clothing and other consumer goods were, by preference or necessity, satisfied in nearby small settlements. Unpublished studies suggest that similar contrasts in mobility and purchase travel patterns currently exist between buggy-using Old Order Amish (see Figure 7.2 in Chapter 7) and their car-driving neighbors.

Source: Robert A. Murdie, "Cultural differences in consumer travel," Economic Geography *41, no. 3 (Worcester, MA: Clark University, 1965).*

significance to an individual (**Figure 3.14**). A small child, for example, will make many trips up and down the block but is inhibited by parental admonitions from crossing the street. Different but equally effective distance constraints control adult behavior.

The journey to work plays a decisive role in defining the activity space of most adults. Formerly restricted by walking distance or by the routes and schedules of mass transit systems, the critical distances of work trips have steadily increased in European and Anglo American cities as the private automobile figures more importantly in the movement of workers (**Figure 3.15**). Daily or weekly shopping may be within the critical distance of an individual, and little thought may be given to the cost or the effort involved. That same individual, however, may relegate shopping for special goods to infrequent trips and carefully consider their cost and effort. The majority of our social contacts tend to be at short distance within our own neighborhoods or with friends who live relatively close at hand; longer social trips to visit relatives are less frequent. In all such trips, however, the distance decay function is clearly at work (**Figure 3.16**).

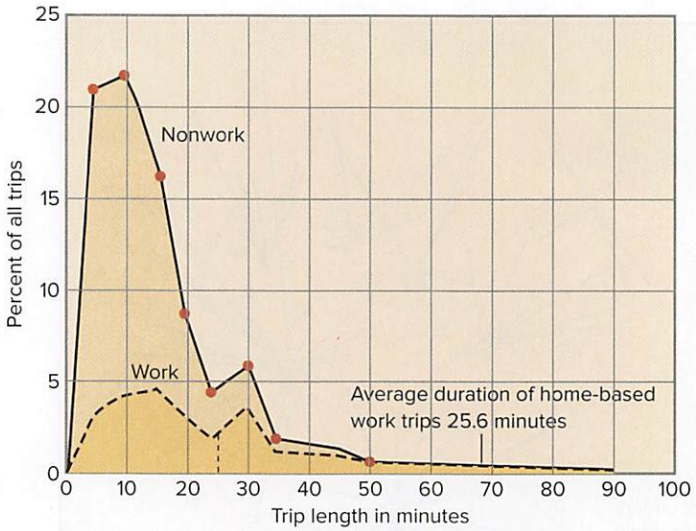


Figure 3.15 The frequency distribution of work and nonwork trip lengths in minutes in the seven-county Minneapolis–St. Paul metropolitan area. Studies in various metropolitan areas support the conclusions documented by this graph: work trips are usually longer than other recurring journeys. In the United States in the early 1990s, the average work trip covered 17.1 kilometers (10.6 miles), and half of all trips to work took less than 22 minutes; for suburbanites commuting to the central business district, the journey to work involved between 30 and 45 minutes. By 2000, increasing sprawl had lengthened average commuting distances and, also because of growing traffic congestion, had increased the average work trip commuting time to 25 minutes; many workers had commutes of more than 45 minutes.

Source: Metropolitan Council: The 2000 Travel Behavior Inventory.

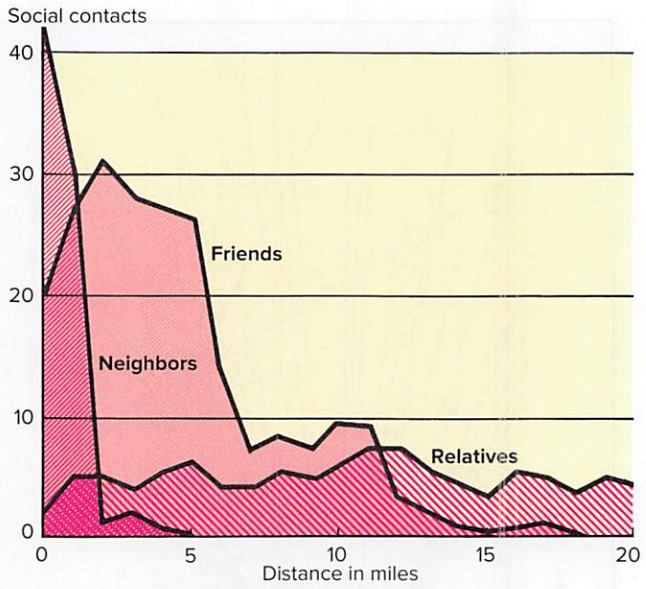


Figure 3.16 Social interaction as a function of distance. Visits with neighbors on the same street are frequent; they are less common with neighbors around the corner and diminish quickly to the vanishing point after a residential relocation. Friends exert a greater spatial pull, though the distance decay factor is clearly evident. Visits with relatives offer the greatest incentive for longer distance (though relatively infrequent) journeys.

Source: Frederick P. Stutz, "Distance and network effects on urban social travel fields," Economic Geography *49(2) (Worcester, Mass.: Clark University, 1973), p. 139.*

Spatial Interaction and the Accumulation of Information

Critical distances, even for the same activity, are somewhat different for each person. The variables of life stage, mobility, and opportunity, together with an individual's interests and demands, help define how often and how far a person will travel. On the basis of these variables, we can make inferences about the amount of information that a person is likely to acquire about his or her activity space and the area beyond. The accumulation of information about the opportunities and rewards of spatial interaction helps increase and justify movement decisions.

For information flows, however, space has a somewhat different meaning than it does for the movement of commodities. Communication does not necessarily imply the time-consuming physical relocations of freight transportation, though in the case of letters and print media, it usually does. In modern telecommunications, the process of information flow may be very quick regardless of distance. The result is extensive space-time compression. A Bell System report tells us that in 1920, putting through a transcontinental telephone call took 14 minutes and eight operators and cost more than $15 for a 3-minute call. By 1940, the call completion time was reduced to less than 1½ minutes, and the cost fell to $4. In the 1960s, direct distance dialing allowed a transcontinental connection in less than 30 seconds, and electronic switching has now reduced the completion time to little more than that involved in dialing a number and answering a phone. The extra price of long-distance conversation essentially disappeared with the advent of voice communication over the Internet early in this century.

The Internet and communication satellites have made worldwide personal and mass communication almost immediate and data transfers a matter of moments. The same technologies that have reduced the time separation of communications have tended to reduce their cost separation. Domestic mail, which once charged a distance-based postage, is now carried nationwide or across town for the same price. In the modern world, transferability is no longer a very significant consideration in information flows. A speculative view of the future suggests that as distance ceases to be much of a determinant of the cost or speed of communication, the spatial structure of economic and social decision making may be fundamentally altered. Determinations about where people live and work, the role of cities and other existing command centers, flows of domestic and international trade, constraints on human mobility, and even the concepts and impacts of national boundaries may fundamentally change with new and unanticipated consequences for patterns of spatial interaction.

Information Flows

Spatially significant information flows are of two types: individual (person-to-person) exchanges and mass (source-to-area) communication. A further subdivision into formal and informal

interchange recognizes, in the former, the need for an interposed channel (radio, press, postal service, or telephone, for example) to convey messages. Informal communication requires no such institutionalized message carrier.

Short-range informal individual communication is as old as humankind itself. Contacts and exchanges between individuals and within small groups tend to increase as the complexity of social organization increases, as the size and importance of the population center grow, and as the range of interests and associations of the communicating person expands. Each individual develops a **personal communication field,** the informational counterpart of that person's activity space. Its size and shape are defined by the individual's contacts in work, recreation, shopping, school, or other regular activities. Those activities, as we have seen, are functions of the age, sex, education, employment, income, and so on of each person. An idealized personal communication field is suggested in **Figure 3.17**.

Each interpersonal exchange constitutes a link in the individual's personal communication field. Each person, in turn, is a node in the communication field of those with whom he or she makes or maintains contact. The total number of such separate informal networks essentially equals the total count of people alive. Despite the number of those networks, all people, in theory, are interconnected by multiple shared nodes (**Figure 3.18**). One debated claim suggested that through such interconnections, no person in the United States is more than six links removed from any other person, no matter where located or how unlikely the association.

Mass communication is the formal, structured transmission of information in essentially a one-way flow between single points of origin and broad areas of reception. There are few transmitters and many receivers. The mass media are by nature "space filling." From single origin points, they address their messages by print, radio, or television to potential receivers within a defined area. The number and location of disseminating points, therefore, are related to their spatial coverage characteristics, to the minimum size of area and population necessary for their support, and to the capability of the potential audiences to receive their message. The coverage area is determined both by the nature of the medium and by the corporate intent of the agency.

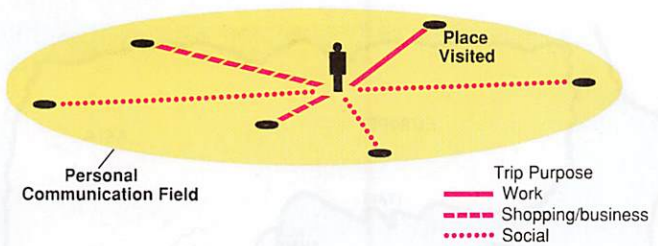


Figure 3.17 A personal communication field is determined by individual spatial patterns of communication related to work, shopping, business trips, social visits, and so on.

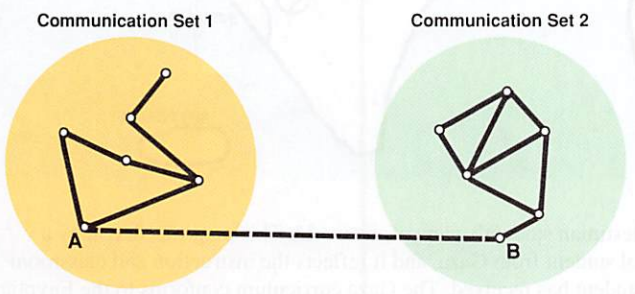


Figure 3.18 Separate population sets (groups) are interconnected by the links between individuals. If link A–B exists, everyone in the two sets is linked.

There are no inherent spatial restrictions on the dissemination of printed materials, though of course limitations and restrictions may be imposed by obscenity laws, religious prohibitions, restrictions in some countries on certain forms of political speech, and the like. And not everyone has access to bookstores or libraries or funds to buy printed material, and not everyone can read. Unlike the distance limitations on the transmission of AM or FM radio waves, however, these restrictions are independent of the area over which printed material could be physically distributed and made available.

In the United States, much book and national magazine publishing is localized in metropolitan New York City, as have the services supplying news and features for sale to the print media located there and elsewhere in the country. Paris, Buenos Aires, Moscow, London—indeed, the major metropolises and/or capital cities of other countries—show the same spatial concentration. Regional journals emanate from regional capitals, and major metropolitan newspapers, though serving primarily their home markets, are distributed over (or produce special editions for distribution within) tributary areas whose size and shape depend on the intensity of competition from other metropolises. A spatial information hierarchy has thus emerged.

Hierarchies are also reflected in the market-size requirements for different levels of media offerings. National and international organizations are required to expedite information flows (and, perhaps, to control their content), but market demand is heavily weighted in favor of regional and local coverage. In the electronic media, the result has been national networks with local affiliates acting as the gatekeepers of network offerings and adding to them locally originating programs and news content. A similar market subdivision is represented by the regional editions of national newspapers and magazines.

The technological ability to fill space with messages from different mass media is useless if receiving audiences do not exist. In illiterate societies, publications cannot inform or influence. Unless the appropriate receivers are widely available, television and radio broadcasts are a waste of resources. Perhaps no invention in history has done more to weld isolated individuals and purely person-to-person communicators into national societies exposed to centralized information flows than has the low-cost transistor radio. Its battery-powered transportability converts the remotest village and the most isolated individual into a receiving node of entertainment, information, and political messages. The direct satellite broadcast of television programs to community antennae or communal sets brings that mass medium to remote areas of Arctic Canada, India, Indonesia, and other world areas able to invest in the technology but as yet unserved by ground stations.

Information and Cognition

Human spatial interaction, as we have seen, is conditioned by a number of factors. Complementarity, transferability, and intervening opportunities help pattern the movement of commodities and peoples. Flows between points and over area are influenced by distance decay and partially explained by gravity and potential models. Individuals in their daily affairs operate in activity spaces that are partly determined by stage in life, mobility, and a variety of socioeconomic characteristics. In every instance of spatial interaction, however, decisions are based on people's beliefs about the opportunity or feasibility of movement, exchange, and the satisfaction of needs and desires, not the objective truth about these things.

More precisely, our actions and decisions are based on our cognition—the awareness that we have, as individuals, of home and distant places, and the beliefs that we hold about their properties. Geographers often refer to such cognitions about Earth locations with the term **place perception,** which is our beliefs, impressions, and feelings—rational or irrational, consciously realized or not—about the natural and cultural characteristics of an area and about its opportunity structure. (Used in this way, geographers are treating the term *perception* as synonymous with cognition.) Whether our views accord with those of others or accurately reflect the "real" world seen in objective terms is not all that matters. Our cognitions are important because the decisions that we make about how to spend our time or about what actions to take in space are not based directly on reality but on our assumptions and impressions of reality.

Cognition of Environment

Psychologists and geographers are interested in determining how we arrive at our cognitions of place and environment both within and beyond our normal activity space. The images we form firsthand of our home territory have been in part reviewed in the discussion of mental maps in Chapter 1. The cognitions we have about more distant places are less directly derived (**Figure 3.19**). In technologically advanced societies, television and radio, magazines and newspapers, Web sites, books and lectures, travel brochures, and hearsay all combine to help us develop a mental picture of unfamiliar places and of the interaction opportunities that they may contain. Again, however, the most effectively transmitted information seems to come from word-of-mouth reports. These may be in the form of letters or visits from relatives, friends, and associates who supply information that helps us develop ideas about relatively unknown areas.

There are, of course, barriers to the flow of information, including that of distance decay. Our knowledge of close places is greater than our knowledge of distant points; our contacts with nearby persons theoretically yield more information than we receive from afar. Yet in crowded areas with maximum interaction potential, people commonly set psychological barriers around themselves so that only a limited number of those possible interactions and information exchanges actually occur. We raise barriers against information overload and to preserve a sense of privacy that permits the filtering out of information that does not directly affect us. There are obvious barriers to long-distance information flows as well, such as time and money costs, mountains, oceans, rivers, and differing religions, languages, ideologies, and political systems.

Barriers to information flow give rise to what we earlier (Section 3.1) called *direction bias.* In the present usage, this implies a tendency to have greater knowledge of places in some directions than in others. Not having friends or relatives in one part of a country may represent a barrier to individuals, so interest in and knowledge of the area beyond the "unknown" region are low. In the United States, both northerners and southerners tend to be less well informed about each other's areas than about the western part of the country. Traditional communication lines in the United States follow an east-west rather than a north-south direction, the result of early migration patterns, business connections, and the pattern of the development of major cities. In Russia, directional bias favors a north-south information flow within the European part of the country and less familiarity with areas far to the east. Within Siberia, however, east-west flows dominate.

When information about a place is sketchy, blurred pictures develop. These influence the impressions that we have of places and cannot be discounted. Many important decisions are made on the basis of incomplete information or biased reports, such as decisions to visit or not, to migrate or not, to hate or not, even to make war or

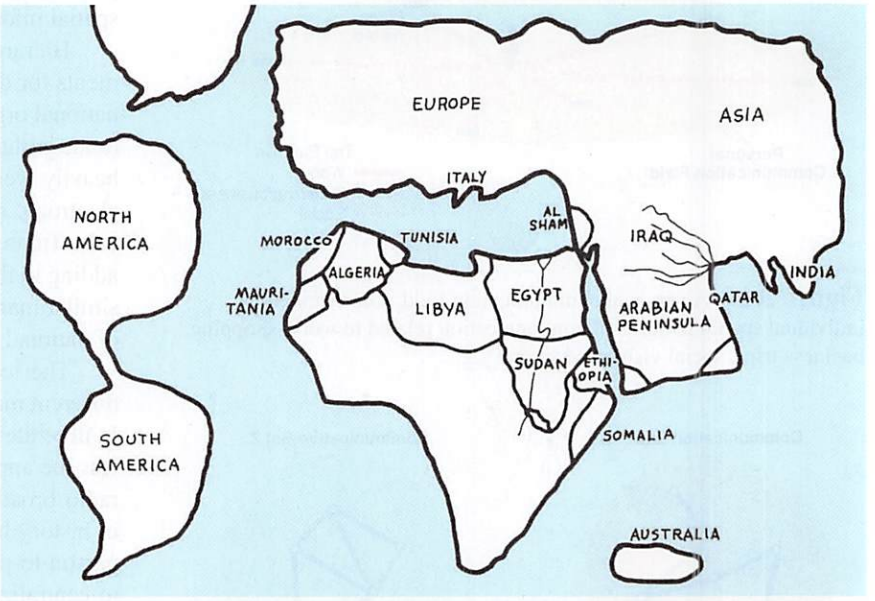


Figure 3.19 A Palestinian student's view of the world. This map was drawn by a Palestinian high school student from Gaza, and it reflects the instruction and classroom impressions that the student has received. The Gaza curriculum conforms to the Egyptian national standards and thus is influenced by the importance of the Nile River and pan-Arabism. Al Sham is the old, but still used, name for the area that includes Syria, Lebanon, and Palestine. The map might be quite different in emphasis if the Gaza school curriculum were designed by Palestinians or if it had been drawn by an Israeli student.

not. Awareness of places is usually accompanied by opinions about them, but there is no necessary relationship between the depth of knowledge and the beliefs held (see the discussion of mental maps and place stereotypes in Chapter 1). In general, the more familiar we are with a locale, the more sound the factual basis of our mental image of it will be. But individuals form firm impressions of places totally unknown to them personally, impressions that may be very inaccurate, and these may color interaction decisions.

One way to determine how individuals envisage home or distant places is to ask them what they think of different locales. For instance, they may be asked to rate places according to desirability—perhaps residential desirability—or to make a list of the 10 best and the 10 worst cities in their country of residence. Certain regularities appear in such inquiries. **Figure 3.20** presents some residential desirability data elicited from college students in three provinces of Canada. These and comparable preference maps derived from studies conducted by researchers in many countries suggest that people generally like the place where they are from but also like some places far away that are widely popular in their culture. For example, students from colleges around the United States tend to rate West Coast states such as California highly, but unless they are from states in the Southeast or the Plains Region, they tend to rate those states poorly. Individuals tend to be indifferent to unfamiliar places and areas and to dislike those that have competing interests (such as distasteful political and military activities or conflicting economic concerns) or a physical environment believed to be unpleasant.

On the other hand, places believed to have superior climates or landscape amenities are rated highly in preference map studies and favored in tourism and migration decisions. Holiday tours to Spain, the south of France, and the Mediterranean islands are heavily booked by the British seeking to escape their damp, cloudy climate. A U.S. Census Bureau study indicates that *climate* is, after work and family proximity, the most often reported reason for interstate moves by adults of all ages. International studies reveal a similar migration motivation based not only on climate, but also on concepts of natural beauty and amenities.

Perception of Natural Hazards

Less certain is the negative impact on spatial interaction or relocation decisions of assessments of **natural hazards**. Natural hazards are elements, processes, or events in the environment

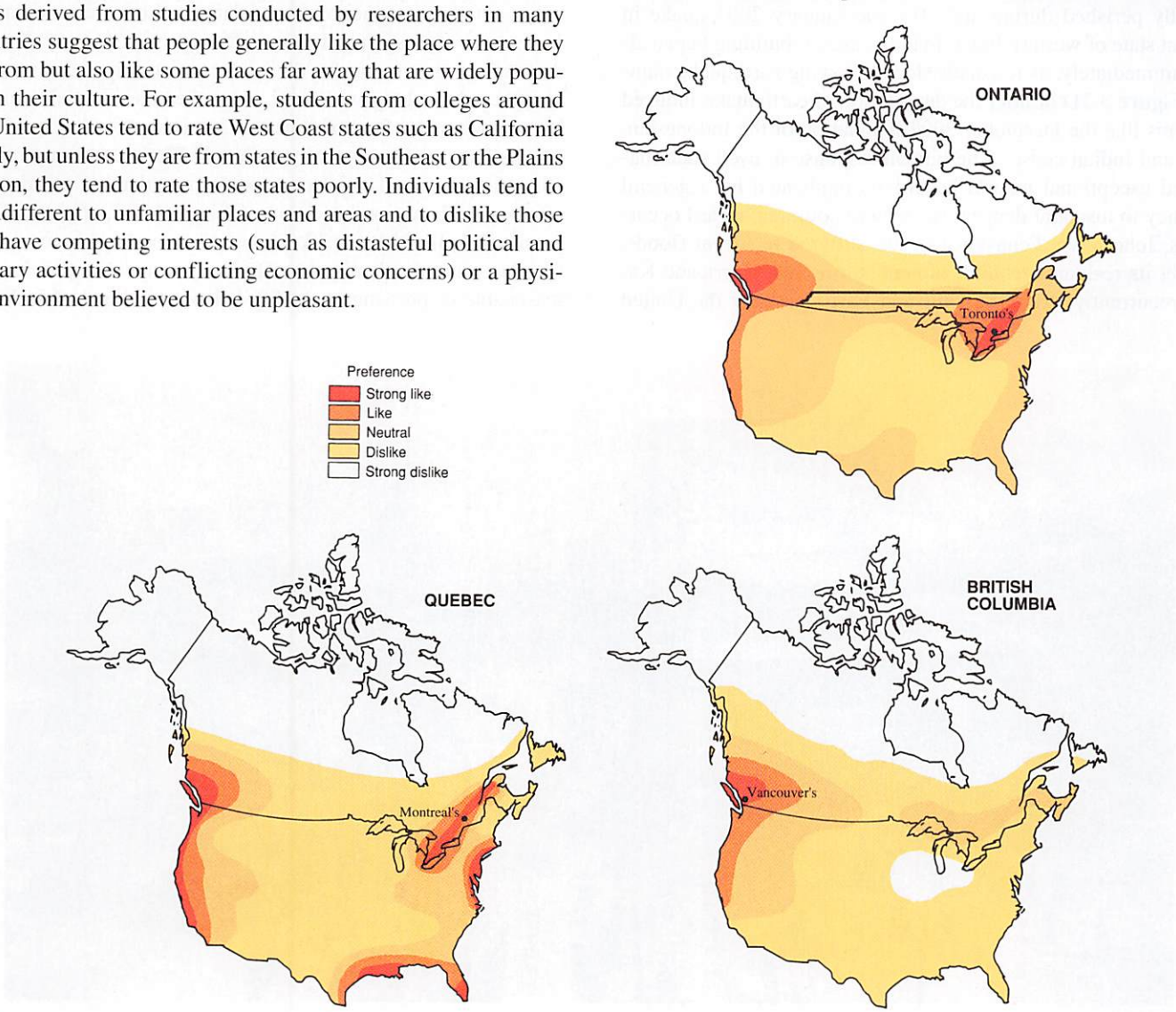


Figure 3.20 Residential preferences of Canadians. These maps show the residential preference of a sampled group of Canadians from the provinces of British Columbia, Ontario, and Quebec, respectively. Note that each group of respondents prefers its own area, but all like the Canadian and U.S. west coasts.

Source: Herbert A. Whitney, "Preferred locations in North America: Canadians, clues, and conjectures," Journal of Geography *83, no. 5. (Indiana, PA: National Council for Geographic Education, 1984): 222.*

that can cause harm to humans. Although the term implies that these hazards are "natural," human adaptation and location decisions always play a major role in determining how disastrous the results are. For example, where we decide to build homes and businesses, and how we construct them, has a major impact on how much destruction is caused by an earthquake.

Mental images of home areas do not generally include an acknowledgment of potential natural dangers as an overriding concern. The cyclone that struck the delta area of Bangladesh on November 12, 1970, left at least 500,000 people dead, yet after the disaster, the movement of people into the area swelled the population above precyclone levels—a resettlement repeated after other, more recent cyclones. The July 28, 1976, earthquake in the Tangshan area of China devastated a major urban industrial complex, with casualties estimated at about a quarter-million, and between 50,000 and 100,000 city dwellers and villagers reportedly perished during and after the January 2001 quake in Gujarat state of western India. In both cases, rebuilding began almost immediately, as it usually does following earthquake damage (**Figure 3.21**) or after the devastation of earthquake-induced tsunamis like the December 2004 inundation of the Indonesian, Thai, and Indian coasts. The human response to even such major and exceptional natural hazards is duplicated by a general tendency to discount dangers from more common hazard occurrences. Johnstown, Pennsylvania, has suffered recurrent floods, and yet its residents rebuild; violent storms like Hurricane Katrina recurrently strike the Gulf and East Coasts of the United States (**Figure 3.22**), and people remain or return. Californians contemplating a move to Kansas may be concerned about tornadoes there but be unconcerned about earthquake dangers at home.

Why do people choose to settle in areas of high-consequence hazards in spite of the potential threat to their lives and property? Why do hundreds of thousands of people live along the San Andreas Fault in California, build houses in Pacific coastal areas known to experience severe erosion during storms, return to flood-prone river valleys in Europe or Asia, or avalanche-threatened Andean valleys? What is it that makes the risk worth taking? Ignorance of natural hazard danger is not necessarily a consideration. People in seismically active regions of the United States and Europe, at least, do believe that damaging earthquakes are a possibility in their districts but, research indicates, are reluctant to do anything about the risk. Similar awareness and reticence accompanies other low-incidence/high-consequence natural dangers. Less than one-tenth of 1 percent of respondents to a federal survey gave "natural disaster" as the reason for their interstate residential move. Geographers have long wondered about these residential decisions by people in the face of repeated hazards. Are they paradoxical, foolish, or, in some way, rational? There are many reasons why natural hazard risk does not deter settlement or adversely affect space-behavioral decisions. Of importance, of course, is the persistent belief that the likelihood of an earthquake or a flood or other natural calamity is sufficiently remote so that it is not reasonable or pressing to modify behavior because of it. People

Figure 3.21 Destruction from the San Francisco earthquake and fire. The first shock struck San Francisco early on the morning of April 18, 1906, damaging the city's water system. Fire broke out and raged for three days. It was finally stopped by dynamiting buildings in its path. When it was over, some 700 people were dead or missing, and 25,000 buildings had been destroyed. Locally, the event is usually referred to as the Great Fire of 1906, suggesting a denial of the natural hazard in favor of assigning blame to correctable human error. Post-destruction reconstruction began at once. Rebuilding following earthquake damage is the general rule.

Figure 3.22 People waiting to be rescued from a New Orleans rooftop following Hurricane Katrina's assault in late August of 2005. More than 1,600 died, hundreds of thousands were left homeless, and tens of billions of dollars of damage were incurred from the storm, which was immediately followed by government and private efforts at recovery and rebuilding.

Source: Jocelyn Augustino/FEMA

are influenced by their natural optimism (which some might call willful ignoring of real risks) and the predictive uncertainty about timing or severity of a rare but calamitous event. Past experiences in high-hazard areas might be relevant. If people have not suffered much damage in the past, they may be optimistic about the future. If, on the other hand, past damage has been great, they may think that the probability of repetition in the future is low, which often represents fallacious thinking (Table 3.1). Lightning may well be *more* likely to strike in the same place, because the first strike we hear about is evidence that the place is attractive to lightning (think of a metal tower on a hill).

Perception of place as attractive or desirable may be quite divorced from any understanding of its hazard potential. Attachment to locale or region may be an expression of emotion and economic or cultural attraction, not just a rational assessment of risk. The culture hearths of antiquity discussed in Chapter 2 and shown on Figure 2.15 were for the most part sited in flood-prone river valleys; their enduring attraction was undiminished by that potential danger. The home area, whatever disadvantages an outside observer may discern, exerts a force of attachment to place and identification with place that is not easily dismissed or ignored.

Indeed, high-hazard areas are often sought out because they possess desirable topography or scenic views, as do, for instance, coastal areas subject to storm damage. Once people have purchased property in a known hazard area, they may be unable to sell it for a reasonable price even if they so desire. They think that they have no choice but to remain and protect their investment. The cultural hazard—loss of livelihood and investment—appears more serious than whatever natural hazards there may be. Carried further, it has been observed that spatial adjustment to perceived natural hazards is a luxury not affordable to impoverished people in general or to the urban and rural poor of Third World countries in particular. Forced by population growth and economic necessity to exert ever-greater

Table 3.1

Common Responses to the Uncertainty of Natural Hazards

Eliminate the Hazard	
Deny or Denigrate Its Existence	Deny or Denigrate Its Recurrence
"We have no floods here, only high water."	"Lightning never strikes twice in the same place."
"It can't happen here."	"It's a freak of nature."
Eliminate the Uncertainty	
Make It Determinate and Knowable	Transfer Uncertainty to a Higher Power
"Seven years of great plenty.... After them seven years of famine."	"It's in the hands of God."
"Floods come every five years."	"The government is taking care of it."

1. Source: *Burton and Kates, "The perception of natural hazards in resource management,"* Natural Resources Journal *435(3) (1964), University of New Mexico School of Law, Albuquerque, NM.*

pressures upon fragile environments or to occupy at higher densities hazardous hillside and floodplain slums, their margin of safety in the face of both chronic and low-probability hazards is minimal to nonexistent (Figure 3.23). In sum, these considerations suggest that there are great economic, cultural, and ideological benefits to living in hazardous places, which when taken together, apparently outweigh the risks to most people.

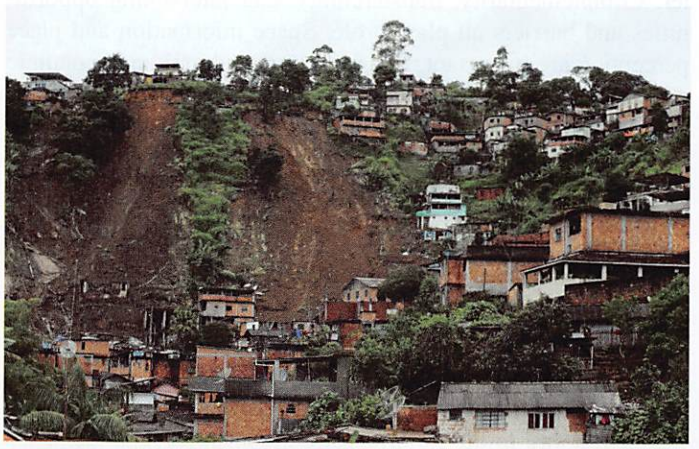


Figure 3.23 Many of the poor of Rio de Janeiro, Brazil, occupy steep hillside locations above the reach of sewer, water, and power lines that keep the more affluent at lower elevations. Frequent heavy rains cause mudflows from the saturated hillsides that wipe away the shacks and shelters that insecurely cling to them, and deposit the homes and hopes of the poor in the richer neighborhoods below.

©VANDERLE ALMEIDA/AFP/Getty Images

Migration

When continental glaciers began their retreat some 11,000 years ago, the activity and awareness spaces of Stone Age humans were limited. As a result of pressures of numbers, need for food, changes in climate, and other inducements, those spaces were collectively enlarged to encompass most of the terrestrial world. *Migration*—the permanent or planned long-term relocation of residential place—has been one of the enduring themes of human history. It has contributed to the evolution of separate cultures, to the diffusion of those cultures and their components by interchange and communication, and to the frequently complex mix of peoples and cultures found in different areas of the world. Indeed, it has been a major force in shaping the world as it is today and continues to be an important force in ongoing world change.

Massive movements of people within countries, across national borders, and among continents have emerged as a pressing concern of recent decades. They affect national economic structures, determine population density and distribution patterns, alter traditional ethnic, linguistic, and religious mixtures, and inflame national debates and international tensions. Because migration patterns and conflicts touch so many aspects of social and economic relations and have become so important a part of current human geographic realities, their specific impact is a significant aspect of several of our topical concerns. Portions of the story of migration have been touched on already in Chapter 2; other elements of it are part of later discussions of population (Chapter 4), ethnicity (Chapter 6), economic development (Chapter 10), urbanization (Chapter 11), and international political relations (Chapter 12). Because voluntary migration is a near-universal expression of spatial assessment and interaction, reviewing its behavioral basis now will give us common ground for understanding its impacts in other contexts later.

Migration embodies all the principles of spatial interaction and space relations that have already been discussed in this chapter. Complementarity, transferability, and intervening opportunities and barriers all play a role. Space information and place perception are important, as are the sociocultural and economic characteristics of the migrants and the distance relationships between their original and prospective locations of settlement. In less abstract terms, group and individual migration decisions may express real-life responses to poverty, rapid population growth, environmental deterioration, or international and civil conflict or war. In its current troubling dimensions, migration may be as much a strategy for survival as an unforced but reasoned response to economic and social opportunity.

Naturally, the length of a specific move and its degree of disruption of established activity space patterns raise distinctions important in the study of migration. A change of residence from the central city to the suburbs certainly changes both residence and activity space of schoolchildren and of adults in many of their nonworking activities, but the working adults may still retain the city—indeed, the same place of employment there—as an activity space. College students frequently change dorm rooms or rental homes during their time at school, even though they attend classes at the same campus and socialize with most of the same friends. On the other hand, the immigration from Europe to the United States and the massive farm-to-city movements of rural Americans late in the 19th and early in the 20th centuries clearly meant a total change of all aspects of behavioral patterns.

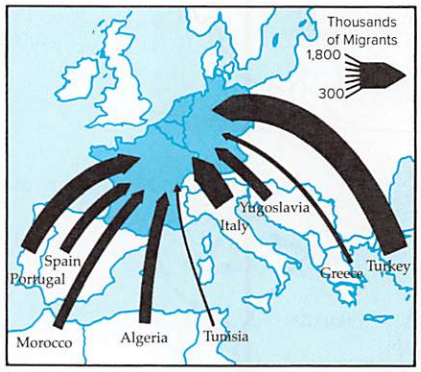
Principal Migration Patterns

Migration flows can be discussed at different scales, from massive intercontinental torrents to individual decisions to move to a new house or apartment within the same metropolitan area. Geographers broadly distinguish **total displacement migrations,** wherein migrants travel so far that they have completely new activity spaces that do not overlap at all with their former home ranges, from **partial displacement migrations,** local moves wherein migrants move to a new residence nearby, with new activity spaces overlapping some with their former home ranges. As discussed more below, such partial displacement moves are actually quite common, an expression of distance decay in migration behavior. At each scale, although the underlying controls on spatial behavior remain constant, the immediate motivating factors influencing the spatial interaction are typically different, with varying impacts on population patterns and cultural landscapes.

At the broadest scale, *intercontinental* movements range from the earliest peopling of the habitable world to the most recent flight of Asian or African refugees to countries of Europe or the Western Hemisphere. The population structure of the United States, Canada, Australia, New Zealand, and Argentina, Brazil, and other South American countries—as Chapter 4 suggests—is a reflection and result of massive intercontinental flows of immigrants that began as a trickle during the 16th and 17th centuries and reached a flood during the 19th and early 20th (Figure 4.20). Later in the 20th century, World War II (1939–1945) and its immediate aftermath involved more than 25 million permanent population relocations, all of them international, but not all intercontinental.

Intracontinental and *interregional* migrations involve movements between countries (*external migrations*) and within countries (*internal migrations*), most commonly in response to individual and group assessments of improved economic prospects, but often reflecting flight from difficult or dangerous environmental, military, economic, or political conditions. The millions of **refugees** leaving their homelands following the dissolution of Eastern European communist states, including the former USSR and Yugoslavia, exemplify that kind of flight. Between 1980 and 2005, Europe received some 23 million newcomers, often refugees, who joined the 15 million labor migrants ("guest workers") already in West European countries by the early 1990s (**Figure 3.24**). North America has its counterparts in the hundreds of thousands of immigrants coming (many illegally) to the United States each year from Mexico, Central America, and the Caribbean region, particularly during the 1990s and 2000s.

The Hauns, whose westward trek opened this chapter, were part of a massive 19th-century regional shift of Americans that continues today (**Figure 3.25**). Russia experienced a similar, though eastward, flow of people in the 20th century. In 2007, nearly 200 million people—roughly 1 of every 33 then alive—lived outside the country of their birth, and migration had become a world social, economic, and political issue of first priority.



AP Figure 3.24 International "guest worker" flows to Western Europe. Labor shortages in expanding Western European economies beginning in the 1960s offered job opportunities to workers immigrating under labor contract from Eastern and Southern Europe and North Africa. Economic stagnation and domestic unemployment halted foreign worker contracting in Germany, France, Belgium, the Netherlands, and Switzerland in the later 1980s and 1990s, but continuing immigration raised the share of foreign workers in the labor force to 20 percent in Switzerland, 10 percent in Austria, and 9.5 percent in Germany by 2000.

Source: Data from Gunther Glebe and John O'Loughlin, eds., "Foreign Minorities in Continental European Cities," Erdkundliches Wissen 84 (Wiesbaden, Germany: Franz Steiner Verlag, 1987).

In the 20th century, nearly all countries experienced a great movement of peoples from agricultural areas to the cities, continuing a pattern of **rural-to-urban migration** that first became prominent during the 18th- and 19th-century Industrial Revolution in advanced economies and now is even more massive than international migrant flows. The rural-to-urban migration going on in China is especially remarkable, as more than 300 million people (about equal to the entire U.S. population!) are predicted to migrate in this way by 2020. Rapid increases in impoverished rural populations of developing countries put increasing and unsustainable pressures on land, fuel, and water in the countryside. Landlessness and hunger, as well as the loss of social cohesion that growing competition for declining resources induces, help force migration to cities. As a result, although the rate of urban growth is decreasing in the more developed countries, urbanization in the developing world continues apace, as will be discussed more fully in Chapter 11.

Motivations to Migrate

Migrations may be forced or voluntary or, in many instances, reluctant relocations imposed on the migrants by circumstances. Put another way, all migrations can be placed on a continuum of motivation from being strongly forced or compelled to being entirely voluntary, with all possible degrees of motivation in between.

In **forced migrations,** the relocation decision is made solely by people other than the migrants themselves (**Figure 3.26**). An estimated 10 to 12 million Africans were forcibly transferred as slaves to the Western Hemisphere from the late 16th to early 19th centuries. Half or more were destined for the Caribbean and most of the remainder for Central and South America, though nearly a million arrived in the United States. Australia owed its earliest European settlement to convicts transported after the 1780s to the British penal colony established in southeastern Australia (New South Wales). More recent involuntary migrants include millions of Soviet citizens forcibly relocated from countryside to cities and from the western areas to labor camps in Siberia and the Russian Far East beginning in the late 1920s. During the 1980s and 1990s, many refugee destination countries in Africa, Europe, and Asia expelled immigrants or encouraged or forced the repatriation of foreign nationals within their borders.

Figure 3.25 Westward shift of population, 1790–2010. More than 200 years of western migration and population growth are recorded by the changing U.S. center of population. (The *center of population* is that point at which a rigid map of the United States would balance, reflecting the identical weights of all residents in their location on the census date.) The westward movement was rapid for the first 100 years of census history and slowed between 1890 and 1950. Some of the post-1950 acceleration reflects population growth in the Sunbelt. However, the large shift in 1960 as compared to 1950 also reflects the geographic pull on the center of population exerted by the admission of Alaska and Hawaii to statehood in 1959.

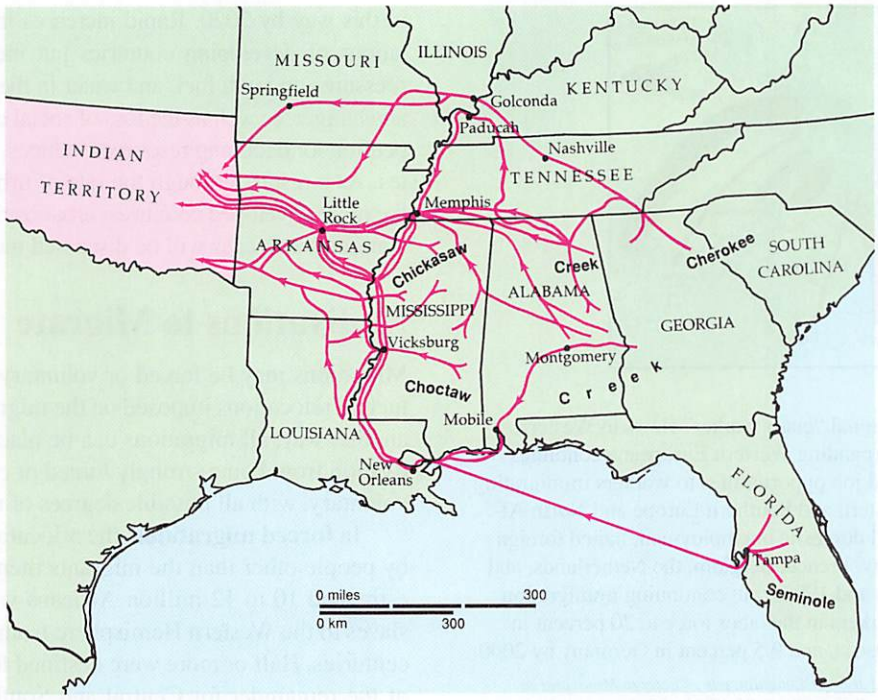


Figure 3.26 Forced migrations: The Five Civilized Tribes. Between 1825 and 1840, some 100,000 southeastern Native Americans were removed from their homelands and transferred by the Army across the Mississippi River to "Indian Territory" in present-day Oklahoma. By far, the largest number consisted of members of the "Five Civilized Tribes" of the South: Cherokees, Choctaws, Chickasaws, Creeks, and Seminoles. Settled, Christianized, literate small-farmers, their forced eviction and arduous journey—particularly along what the Cherokees named their "Trail of Tears" in the harsh winter of 1837–1838—resulted in much suffering and death.

Less than fully voluntary migration—**reluctant relocation**—of some 8 million Indonesians has taken place under an aggressive governmental campaign begun in 1969 to move people from densely settled Java (roughly 775 per square kilometer or 2,000 people per square mile) to other islands and territories of the country, in what has been called the "biggest colonization program in history." International refugees from war and political turmoil or repression numbered nearly 13.5 million in 2005, according to the United Nations.

In recent decades, the vast majority of new international migrants has been absorbed by the developed countries. But there has also been an increasing flight from developing countries to other developing regions, and many countries with the largest refugee populations are among the world's poorest. Sub-Saharan Africa alone houses more than 3 million refugees (**Figure 3.27**). Between 2003 and 2007, Iran, Syria, and Jordan became home to millions of Iraqis fleeing persecution, terrorism, and war. Additionally, at the end of 2005, the Internal Displacement Monitoring Centre estimated that there were 25.3 million people in some 40 countries worldwide who were "refugees" in their own countries as a result of conflicts or human rights violations; in a search for security or sustenance, they had left their home area but not crossed an international boundary. The total did not include those additional millions internally displaced by environmental disasters such as the southeast Asian tsunami in 2004 or Hurricane Katrina in 2005.

Poverty is the great motivator. Some 30 percent of the world's population—nearly 2 billion persons—have less than $1 per day of income. In addition, many are victims of drought, floods, other natural catastrophes, or wars and terrorism. Poverty in developing countries is greatest in the countryside; rural areas

Figure 3.27 Rwandan refugees near the border of Rwanda and Zaire. More than 1 million Rwandans fled into neighboring Zaire (now, the Democratic Republic of the Congo), Tanzania, Uganda, and Burundi in 1994 to escape an interethnic civil war in their home country and the genocide and retribution that killed at least 750,000 people. Early in the 21st century, more than 14 million Africans remained uprooted (that is, internally displaced and refugees combined). Fleeing war, repression, and famine, millions of people in developing nations have become reluctant migrants from their homelands.

are home to around 750 million of the world's poorest people. Of these, some 20 to 30 million move each year to towns and cities, many as "environmental refugees" abandoning land so eroded or exhausted it can no longer support them. In the cities, they join the 40 percent or more of the labor force that is unemployed or underemployed in their home country and seek legal or illegal entry into more promising economies of the developed world. All, rural or urban, respond to the same basic forces—the push of poverty and the pull of perceived or hoped-for opportunity.

Those motivating forces are controlling in much of the international flow of illegal migrants whose economic condition in their homelands, they feel, is so intolerable that to seek employment they risk their lives in flight by unsafe boat and raft or through forbidding natural boundary barriers as involuntary but unforced migrants. Without immigration papers or legal status, subject to arrest and deportation or worse, illegal immigrants able to find work and income satisfy some of their migration objectives by sending money home to ensure their families' survival. Immigrants from poor countries, the World Bank estimated, sent more than 260 billion traceable dollars home in 2006; money sent through informal channels increased that total by as much as 50 percent. The traceable **remittance** amount alone in 2005 was on a par with the total of foreign direct investment in developing countries and twice the value of foreign aid. The estimated 17 million Latin American immigrants (again, not all illegal) in the United States sent an estimated $45 billion a year in legal and illegal remittances to their home countries in 2006 ($19 billion to Mexico alone). For some Latin American countries, those remittances account for about 20 percent of the money circulating in their economies.

The great majority of migratory movements, however, are **voluntary migrations** (volitional), representing individual response to the factors influencing all spatial interaction decisions. At root, migrations take place because the migrants believe that their opportunities and life circumstances will be better at their destination than they are at their present location.

Controls on Migration

Economic considerations crystallize most migration decisions, though nomads fleeing the famine and spreading deserts of the Sahel obviously are impelled by different economic imperatives than is the executive considering a job transfer to Montreal or the resident of Appalachia seeking factory employment in the city. Among the aging, affluent populations of highly developed countries, retirement amenities figure importantly in beliefs about the residential attractiveness of areas. Educational opportunities, major life events such as getting married, moving closer to family members, and environmental attractions or repulsions are but a few other possible migration motivations. Migration theorists attribute international economic migrations to a series of often overlapping mechanisms. Differentials in wages and job opportunities between home and destination countries are perhaps the major driving force in such individual migration decisions. Those differentials are in part rooted in a built-in demand for workers at the bottom of the labor hierarchy in more prosperous developed countries whose own workers disdain low-income, menial jobs with poor wages and benefits. Migrants are available to fill those jobs, some argue, because advanced economies make industrial investment in developing or colonial economies to take advantage of lower labor costs there. New factories inevitably disturb existing economies, employ primarily short-term female workers, and leave a residue of unemployed males available and prone to migrate in search of opportunity. If successful, international economic migrants, male or female, help diversify sources of family income through their remittances from abroad, a form of household security that in itself helps motivate some international economic migration.

Negative home conditions that impel the decision to migrate are called **push factors.** They might include loss of job, lack of professional opportunity, overcrowding or slum clearance, or a variety of other influences, including poverty, war, violent crime, and famine. The presumed positive attractions of the migration destination are known as **pull factors.** They include all the attractive attributes believed to exist at the new location—safety and food, perhaps, or job opportunities, better climate, lower taxes, quality schools, more room, and so forth. Very often, migration is a result of both push and pull factors. But it is important to recognize that it is the migrant's beliefs about the areal pattern of opportunities and want satisfaction that is important here, whether or not those beliefs are supported by objective reality.

The concept of place utility helps us to understand the decision-making process that potential voluntary migrants undergo. **Place utility** is the measure of an individual's satisfaction with a given residential location. The decision to migrate is a reflection of the appraisal—the perception—by the prospective migrant of the current homesite compared to other sites of which something is known or hoped for. In the evaluation of comparative place utility, the decision maker considers not only the believed value of the present location, but also the expected place utility of potential destinations. Seen in this way, we can understand that all migrations not strictly forced are a combined response to push factors at the current location relative to the pull factors of potential new residential sites.

Those evaluations are matched with the individual's aspiration level, that is, the level of accomplishment or ambition that the person sees for herself or himself. Aspirations tend to be adjusted to what one considers attainable. If one finds present circumstances satisfactory, then **spatial search** behavior—the process by which locational alternatives are evaluated—is not initiated. If, on the other hand, dissatisfaction with the home location is felt, then a utility is assigned to each of the possible migration locations. The utility is based on past or expected future rewards at various sites. Because new places are unfamiliar to the searcher, the information received about them acts as a substitute for the personal experience of the homesite. Decision makers can do no more than sample information about place alternatives and, of course, there may be errors in both information and interpretation. Ultimately, these anticipated utilities depend on beliefs—place perceptions—about the places being considered and on the motivations of potential migrants that prompt them to consider long-distance migration, or even relocation of residence within the local area. In the latter instance, of course,

the spatial search usually involves actual site visits in evaluating the potential move (**Figure 3.28**). Of course, even actual visits cannot generally show people everything important there is to know about a place being considered for a new home (just as one date does not usually tell us whom to marry!).

One goal of the potential migrant is to avoid physically dangerous or economically unprofitable outcomes in the final migration decision. Place utility evaluation, therefore, requires assessments not only of hoped-for pull factors of new sites, but also of the potentially negative economic and social reception the migrant might experience at those sites. An example of that observation can be seen in the case of the large numbers of young Mexicans and Central Americans who have migrated both legally and illegally to the United States (**Figure 3.29**). Faced with poverty, crime, and overpopulation at home, they regard the place utility in Mexico as minimal. With a willingness to work, they learn from friends and relatives of job opportunities north of the border and, hoping for success or even wealth, quickly place high utility on relocation to the United States. Many know that dangerous risks are involved in entering the country illegally, but even legal immigrants face legal restrictions or rejections that are advocated or designed to reduce the pull attractions of the United States (see the feature "Porous Borders").

Another migrant goal is to reduce uncertainty about the move and the new residential destination. That objective may be achieved either through a series of transitional relocation stages or when the migrant follows the example of known predecessors. **Step migration** involves the place transition from, for example, rural to central city residence through a series of less extreme locational changes—from farm to small town to suburb and, finally, to the major central city itself. **Chain migration** assures that the mover is part of an established migrant flow from a common origin to a prepared destination. An advance group of migrants, having established itself in a new home area, is followed by second and subsequent migrations originating in the same home district and frequently united by kinship or friendship ties. Public and private services for legal migrants and informal service networks for undocumented or illegal migrants become established and contribute to the continuation or expansion of the chain migration flow. Ethnic and foreign-born enclaves in major cities and rural areas in a number of countries are the immediate result, as we shall see more fully in Chapter 6.

Sometimes the chain migration is specific to occupational groups. For example, nearly all newspaper vendors in New Delhi, in the north of India, come from one small district in Tamil Nadu, in the south of India. Most construction workers in New Delhi come either from Orissa, in the east of India, or Rajasthan, in the northwest. The diamond trade of Mumbai, India, is dominated by a network of about 250 related families who come from a small town several hundred miles to the north. Many members of particular small towns in Mississippi ended up in the same neighborhood in Chicago as part of the great internal migration of African Americans from the rural South to northern and western cities during the mid-twentieth century.

Certainly, not all immigrants stay permanently at their first destination. Of the some 80 million newcomers to the United States between 1900 and 1980, some 10 million returned to their homelands or moved to another country. Estimates for Canada indicate that perhaps 40 of each 100 immigrants eventually leave, and about 25 percent of newcomers to Australia also depart permanently. Therefore, a corollary of all out-migration flows is **counter** (or **return**) **migration,** the likelihood that as many as 25 percent of all migrants will return to their place of origin.

Within the United States, return migration—defined as moving back to one's state of birth—makes up about 20 percent of all domestic moves. That figure varies dramatically among states. More than a third of recent in-migrants to West Virginia, for example, were returnees—as were more than 25 percent of those moving to Pennsylvania, Alabama, Iowa, and a few other states. Such widely different states as New Hampshire, Maryland, California, Florida, Wyoming, and Alaska were among the several that found returnees were fewer than 10 percent of their in-migrants. Interviews suggest that states deemed attractive draw new migrants in large numbers, whereas those with high proportions of returnees in the migrant stream are not believed to be desirable destinations by other than former residents. The preference maps we looked at above reveal these sorts of place preferences.

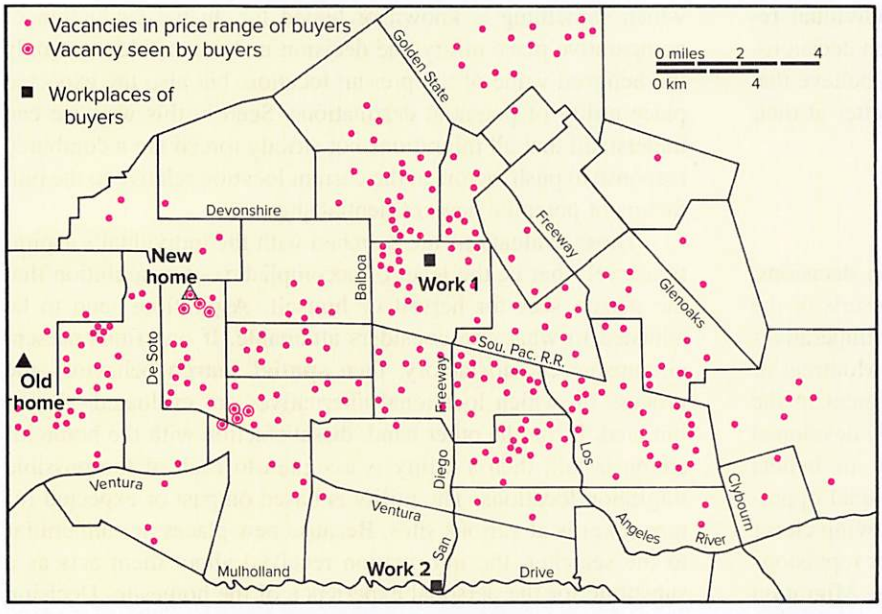


Figure 3.28 An example of a residential spatial search. The dots represent the house vacancies in the price range of a sample family. Note (1) the relationship of the new house location to the workplaces of the married couple; (2) the relationship of the old house location to the chosen new homesite; and (3) the limited total area of the spatial search. This example from the San Fernando Valley area of Los Angeles is typical of intraurban moves.

Source: J. O. Huff, Annals of the Association of American Geographers, *Vol. 76, 217 -221. Association of American Geographers, 1986.*

(a)

(b)

Figure 3.29 *(a)* Unauthorized Mexican immigrants running from the U.S. Border Patrol. *(b)* Workers build portions of a barrier fence on the U.S.–Mexico border, dividing Calexico, California, from Mexicali, Baja California.

Source: (b) Image released by the United States Air Force with the ID 061003-F-1726H-004.

(a) ©Per-Anders Pettersson/Hulton Archive/Getty Images; (b) Source: DoD photo by Staff Sgt. Dan Heaton, U.S. Air Force

AP Geography and Citizenship

Porous Borders

Many residents of the U.S. were born in another country—about 13 to 14 percent of the United States population as of 2016. The United States has been the most popular destination for international migrants for at least half a century (and quite a few before then as well); about 20 percent of the world's current international migrants live there. But migrants can enter a country legally—with a passport, visa, working permit, or other authorization—or illegally, without authorization (also referred to as *undocumented*). And some immigrants arrive claiming the right of political asylum but actually seeking economic opportunity. Others enter the country legally but on a temporary basis (as a student or tourist, for example) but then remain after their official departure date. The U.S. Department of Homeland Security estimates that between one-fourth and one-third of those residing without authorization in the United States entered the country legally but then overstayed their visas.

It is impossible to determine the precise number of people residing without authorization in the United States; this population is very difficult to count accurately. At this time, the Census attempts to count everyone living in the United States but does not attempt to determine residents' legal status (the Trump administration proposes to add this question to the 2020 Census). The number of people residing without authorization changes on a daily basis, and most of these people are obviously not eager to make sure government agencies know they reside here. A widely accepted figure (from the Pew Research Center and other sources) estimates the number of people living without authorization in the United States in the year 2017 at about 11 million. This is much higher than the 3½ million estimated to have resided illegally in the United States in 1990, but actually a decline from the more than 12 million believed to have been here in 2007, perhaps the peak year in American history (the United States had virtually an open border until the 1920s). The main cause for the decline during the last 10 years has apparently been the large economic recession starting in 2008.

About 52 percent of unauthorized immigrants in the United States came from Mexico, another 21 percent from other Central American countries and the Caribbean, 12 percent from Asia, 6 percent from South America, 3 percent from Africa, and the rest from Canada, Europe, and Oceania. Although, historically, a substantial majority of people migrating to the United States without authorization came from Mexico, the source of unauthorized immigrants has changed considerably during the last decade. During this time, there has actually been net out-migration of Mexican people here without authorization—more people here illegally from Mexico have left the United States (most returning to Mexico) than have entered. Those coming from other countries have increased during this time, however, in some sense "making up" for the decrease in Mexican immigrants. There has especially been a big increase in people coming without authorization from Central America south of Mexico (who generally travel through Mexico to get to the United States) and from Asia, particularly China and India (the countries with the two largest populations in the world).

More than half of unauthorized immigrants reside in four states: California (25 percent), Texas (11 percent), New York (10 percent), and Florida (6 percent). They are clustered in large urban areas, with just 20 large metropolitan areas (led by New York, Los Angeles, and Houston) accounting for something like 60 percent of the unauthorized residents. But they reside in every state, and in both rural and urban areas. The states with the smallest unauthorized populations are Montana, North Dakota, and West Virginia, each with less than 5,000 such residents.

Attitudes against unauthorized immigrants that some have expressed have been directed mainly against those from Mexico and other Latin American countries, most of whom are unskilled workers. Once in the United States, Latin American immigrants have found work in agricultural fields, animal slaughtering and meatpacking facilities, construction, hotels, and restaurants. Many work in private residences as maids, nannies, and gardeners, and, hence, citizens of wealthy enclaves often express stronger support for the rights of unauthorized immigrants to stay in the United States The demand for their labor is great enough that male immigrants here without authorization have a higher labor-force participation rate than male immigrants here legally (92 percent versus 85 percent), who, in turn, participate at a higher rate than males who are native-born (81 percent). Interestingly, the pattern is reversed for females. Females here without authorization have lower labor-force participation rates than female immigrants here legally (61 percent versus 64 percent), who themselves participate at a lower rate than native-born females (72 percent).

Public opinion is distinctly split about what the United States should do concerning both the continuing streams of unauthorized immigrants and those who are here already. Many people are concerned about the loss of employment opportunities or depression in wages they believe immigrants cause, as well as the increased strain they put on housing stocks, traffic congestion, emergency room visits, and public schools, the latter particularly considering the challenges of providing public education for students who do not speak English well. There is concern that illegal immigration opens our country to disease, drug smuggling, and terrorism (concern about disease is a very traditional and long-standing anxiety about foreign immigration). Some people, including many legal immigrants, just feel that it is wrong for people to enter without the long and rather arduous process of applying to enter and reside legally. In contrast, other people believe that the United States acts compassionately by accepting new residents who want only to work, provide for their families, and escape from poverty and drug violence. Some supporters claim that immigrants increase the strength of the U.S. economy, through their consumption, production, and payment of taxes. Others argue that unauthorized immigrants keep the costs of agricultural products low and do jobs "Americans will not take" (a claim of the George W. Bush administration). They value the cultural diversity immigrants bring and do not believe that immigrants (authorized or not) are major contributors to disease and crime (evidence supports their view on these claims). Many supporters of legalizing unauthorized immigrants simply believe it is practically and morally unimaginable to propose deporting so many people from our country, in many cases returning them to harsh and dangerous conditions.

Thus, attitudes toward unauthorized immigration vary greatly, with multiple arguments

on both sides of the issue. However, it appears that a clear majority of Americans favor some way of granting legal status to immigrants currently residing illegally in the United States In the 2015 *American Values Atlas* survey (Public Religion Research Institute), 62 percent of Americans agreed that unauthorized immigrants should be allowed to become citizens providing they meet certain requirements, and 15 percent agreed they should be allowed to become permanent legal residents but not citizens. Just 19 percent believed they should be identified and deported (4 percent offered no opinion).

Concern over the large number of unauthorized immigrants has been reflected in a number of actions in recent decades. Greater efforts have been made to deter unauthorized crossings along the 1,950-mile U.S.-Mexico border. This border is enforced with nearly 700 miles of fencing of different types (some of which is fairly easy to climb over, if you can get to that spot over rough terrain). Thousands of Border Patrol agents use automotive vehicles, helicopters, drones, night-vision cameras, and hidden electronic sensors to surveil the border. Apprehensions at the border vary year to year, in part because of changing emphasis by presidential administrations. During the Obama administration, the number was as high as 800,000 in 2010 and as low as 460,000 in 2015. In parts of Arizona and California, self-appointed Minutemen —groups of volunteer militia—patrol the border "to protect our country from a 40-year long invasion across our southern border with Mexico," as one vigilante put it. A cornerstone of President Trump's platform when running for office was a promise to build a tall barrier wall along the entire southern border. As of this writing, his administration continues to push Congress to provide initial funding for the wall. Interestingly, the Pew Research Center reports that as of early 2018, more than half (60 percent) of Americans are against having the government "substantially expand the wall along the U.S. border with Mexico". Democrats are strongly against it (6½ to 1 against), whereas Republicans strongly support such an expansion (3 to 1 in favor).

With respect to unauthorized immigrants who are already in the United States, many people advocate implementing a process of vetting and eventually granting them authorization to be here. This has happened more than once before; millions of unauthorized residents managed to achieve legal status by taking advantage of government amnesties offered between 1984 and 2000. In 2012, the Obama administration launched the *Deferred Action for Childhood Arrivals,* or *DACA,* program. It offered two years of work authorization and relief from the threat of deportation to young adult immigrants who were brought into the United States without authorization by their parents or other adults before they were 16 years of age, as long as they had lived continuously in the United States, had gone to school, and had not been convicted of significant criminal behaviors or deemed a threat to public safety or national security. It has been estimated that more than a million people currently meet these criteria, with another half million nearly meeting them. Most of these applicants have applied for the program, a majority of whom have been granted DACA status. In September of 2017, however, the Trump administration rescinded DACA with a six-month wind-down. Public opinion does not support this much—the Pew Center report from early 2018 finds that 74 percent of Americans favor granting legal status to DACA candidates. Democrats and those leaning Democratic are at least 9 to 1 in favor of it, and although Republicans and those leaning Republican are much less in favor, they are still a bit more likely to support it than oppose it. A political compromise being debated by Congress and the president is to reinstate much of the DACA program in return for funding for the border wall. Clearly, the issue of unauthorized immigration continues to be prominent in political and policy debates in the United States.

Thinking Geographically

1. Making unauthorized crossings more difficult in California did not diminish the number of migrants making the journey north. It simply pushed coyotes, the people who lead migrants across the border, into Arizona. Some people believe resourceful migrants will always find a way to get across the border. As one observer noted, "It's like putting rocks in a river—the water just goes around it." Is there is any way to seal the entire U.S.-Mexico border, or will immigration continue as long as the income gap between the United States and many Latin American countries remains so great? Conduct additional research to learn more about the income gap between the United States and Latin American countries. Is the income gap extreme for all countries? What is the nature of the income gap? How could the gap be addressed to make life in Latin American countries more desirable? Write a research paper that addresses these questions.
2. With regard to proposals for a temporary-worker program, the libertarian Cato Institute argues that when there is no immigration barrier, circular migration occurs, with migrant workers entering and leaving almost at will. It cites Puerto Rico as an example; many who move to the U.S. mainland stay for just a few years, and out-migration from the island is very low. A temporary worker program, on the other hand, encourages migrants to move north with their entire families, and those who are already in the United States stay for good because border crossings become more expensive and dangerous. If you were a member of the U.S. Congress, would you be in favor of creating a guest-worker program? Write a one-page position paper on this issue.
3. It is often said that unauthorized immigrants perform jobs that "Americans won't take". Why do you think many immigrants are willing to work for low wages, often under poor working conditions? Would Americans take the jobs if they paid, say, $20 per hour and offered health care and other benefits?
4. What would happen if all states followed Arizona's lead in passing and enforcing laws targeting employers of undocumented workers? One in 10 or 11 workers in Arizona is unauthorized, and opponents of the legislation contend that the state has put its economy in jeopardy. The workers tend to be reliable, they fill necessary jobs, spend their wages in the communities in which they live and work, and most pay taxes because employers in the construction, hotel, restaurant, and other industries withhold taxes from paychecks. Create an oral presentation to share your thoughts and reasoning on this issue.

(Continued)

5. Anyone born on U.S. soil (except the children of foreign diplomats or the like) automatically becomes a U.S. citizen, even if their parents entered the country illegally. Likewise, the immediate family members (spouses, children, parents) of anyone in the United States legally gets preferential legal admission to move to the United States This *family reunification* principle is an example of chain migration. Critics argue that these principles are inappropriate and responsible for excess immigration into the United States Work with a partner to debate this topic. One of you will argue for and one of you will argue against each of these principles. You may need to conduct outside research to prepare for your debate. Be sure that you can support your position.
6. Should unauthorized residents already in the United States be given the opportunity to get worker permits and the possibility of eventual citizenship (if they have no criminal record) by doing the following: pay a fine, demonstrate that they are gainfully employed, and have paid taxes? Write a paragraph defending your position.
7. Does the federal government has an obligation to fully or partially reimburse state and local governments for the costs of education, medical care, incarceration, and other legal services for unauthorized immigrants? Why or why not? Write a position paper on this issue.

Once established, origin and destination pairs of places tend to persist. Areas that dominate a locale's in- and out-migration patterns make up the **migration fields** of the place in question. As we would expect, areas near the point of origin comprise the largest part of the migration field (remember distance decay and the First Law), though larger cities more distantly located may also be prominent as the ultimate destination of hierarchical step migration (**Figure 3.30**). As **Figure 3.31** shows, some migration

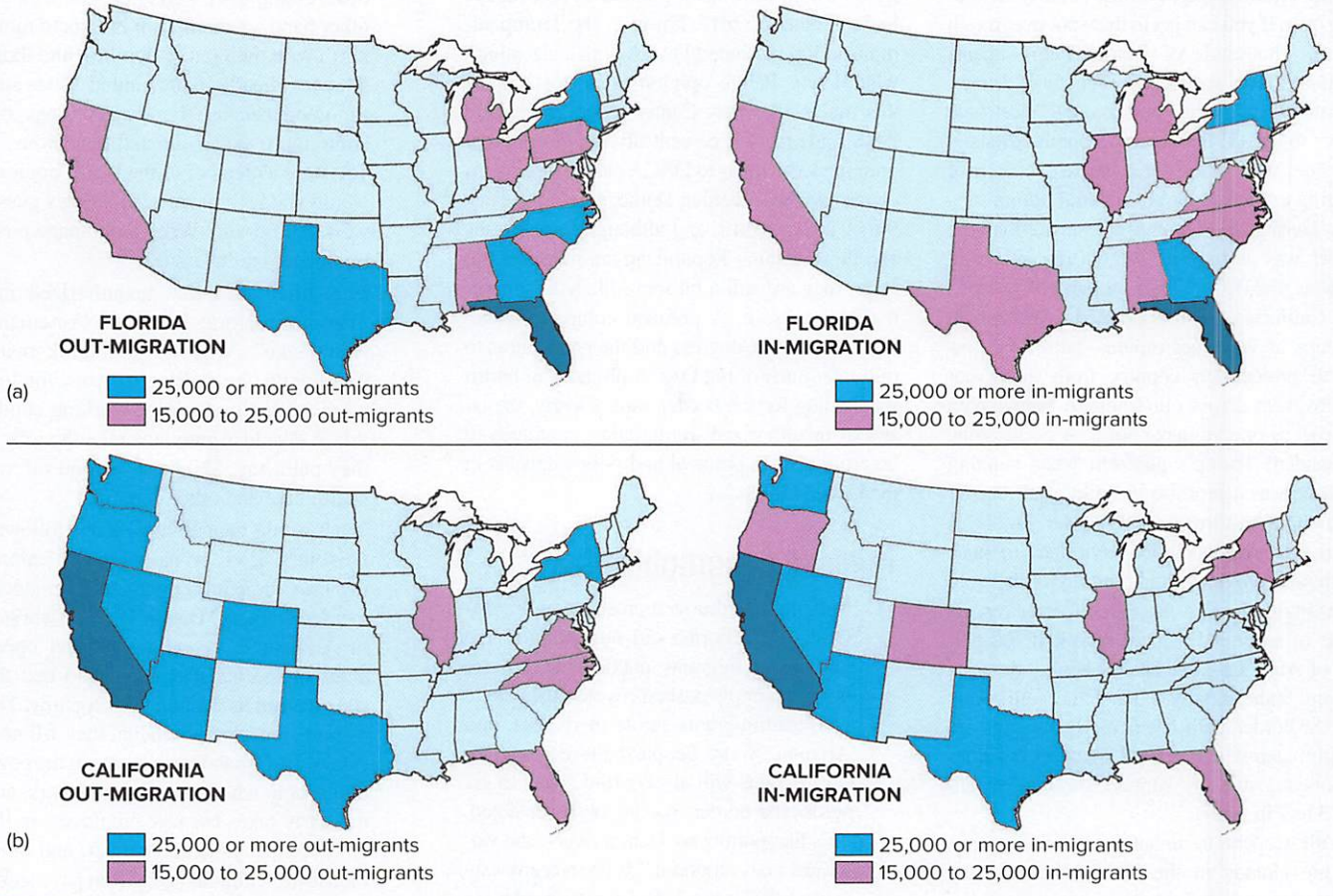


Figure 3.30 The migration fields of Florida and California in 2005–2010. (*a*) For Florida, nearby Georgia receives most out-migrants, but in-migrants originate in large numbers from the northeastern United States. (*b*) For California, the nearby western states receive large numbers of out-migrants, and there are fewer in-migrants from those states.

Source: U.S. Census Bureau.

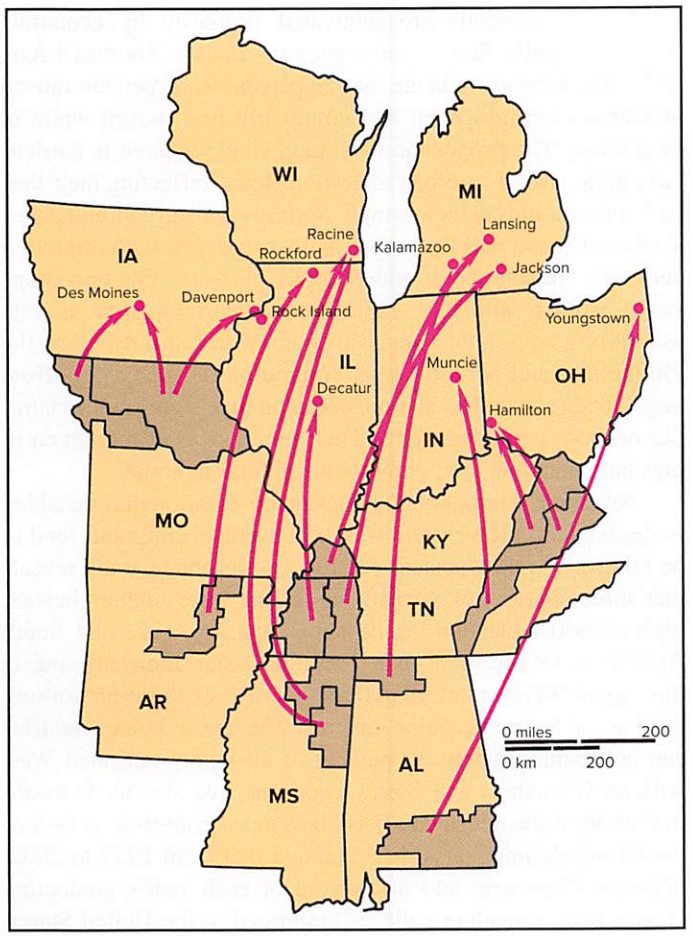


Figure 3.31 In the United States in the late 20th century, channelized migration flows from the rural south to midwestern cities of medium size. Distance is not the only determinant of flow direction. Through family and friendship links, the rural southern areas were tied to particular midwestern destinations.

Source: Proceedings of the Association of American Geographers, *C. C. Roseman, Vol. 3, p. 142.*

fields reveal a distinctly channelized pattern of flow. The channels link areas that are in some way tied to one another by past migrations, by economic trade considerations, or some other affinity. The flow along them is greater than otherwise would be the case (such as predicted by a standard gravity model) but does not necessarily involve individuals with personal or family ties. The former streams of southern blacks and whites to northern cities, of Scandinavians to Minnesota and Wisconsin, and of U.S. retirees to Florida and Arizona or their European counterparts to Spain, Portugal, or the Mediterranean coast are all examples of **channelized migration.**

Voluntary migration is responsive to the other controls that influence all forms of spatial interaction. Push-pull factors may be equated with complementarity; costs (emotional and financial) of a residence relocation are expressions of transferability. Other things being equal, large cities exert a stronger migrant pull than do small towns, a reflection of the impact of the gravity model. We noted the influence of distance decay in migration studies. Movers seek to minimize the friction of distance. In selecting between two potential destinations of equal merit, a migrant tends to choose the nearer as involving less effort and expense. And because information about distant areas may be less complete and less certain than knowledge about nearer localities, short moves are favored over long ones. Research indicates that determined migrants with specific destinations in mind are unlikely to be deterred by distance considerations. However, groups for whom push factors determine the migration decision more than specific destination pulls are likely to limit their migration distance in response to encountered apparent opportunities. For them, intervening opportunities affect locational decisions. The concept of hierarchical migration also helps explain some movement decisions. Individuals in domestic relocations tend to move up the level in the urban hierarchy, from small places to larger ones. Often, levels are skipped on the way up; only in periods of general economic decline is there considerable movement down the hierarchy. Because suburbs of large cities are considered part of the metropolitan area, the movement from a town to a suburb is considered a move up the hierarchy.

Observations such as these were summarized in the 1870s and 1880s as a series of **"laws of migration"** by E. G. Ravenstein (1834–1913). Among those that remain relevant are the following:

- Most migrants go only a short distance.
- Longer-distance migration favors big-city destinations.
- Most migration proceeds step by step.
- Most migration is rural to urban.
- Each migration flow produces a counterflow.
- Most migrants are adults; families are less likely to make international moves.
- Most international migrants are young males.

The latter two "laws" introduce the role of personal attributes (and attitudes) of migrants: their age, sex, education, and economic status. Migrants do not represent a cross section of the populace from which they come. Selectivity of movers is evident, and the selection shows some regional differences. In most societies, young adults are the most mobile (**Figure 3.32**). In the United States, mobility peaks among those in their twenties, especially the later twenties, and tends to decline thereafter. Among West African cross-border migrants, a World Bank study reveals, the age group 15–39 predominated. Young adults have weaker ties to their place of origin than older adults, being less likely to have careers or stable employment, mates, children, houses, and other material possessions. They are also generally healthier with more energy and endurance for the challenges of relocation.

Ravenstein's conclusion that young adult males are dominant in economically pushed international movement is less valid today than when first proposed. In reality, women and girls now comprise 40 to 60 percent of all international migrants worldwide (see the feature "Gender and Migration"). It is true that legal and illegal migrants to the United States from Mexico and Central America are primarily young men, as were first-generation "guest workers" in European cities. But population

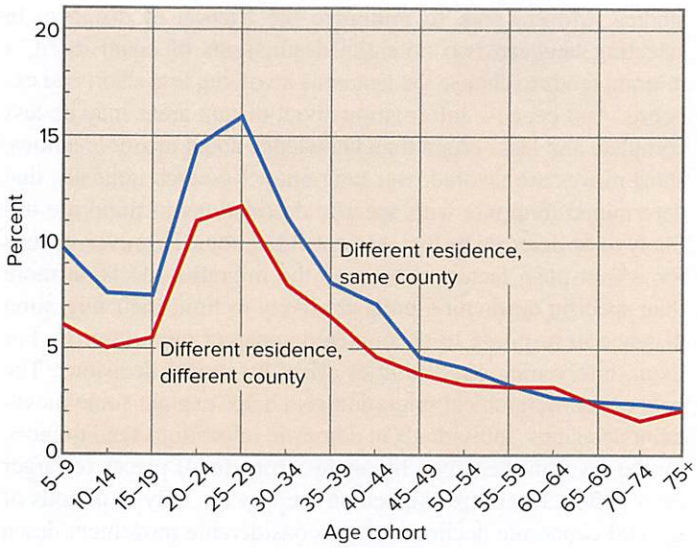


Figure 3.32 Percentage of 2004 population over 5 years of age with a different residence than in 2003. Young adults figure most prominently in both short- and long-distance moves in the United States, an age-related pattern of mobility that has remained constant over time. For the sample year shown, 28 percent of people in their 20s moved, whereas fewer than 5 percent of those 65 and older did so. Short-distance moves predominate; 58 percent of the 39 million total U.S. movers between March 2003 and March 2004, relocated within the same county and another 20 percent moved to another county in the same state. Some two-thirds of intracounty (mobility) moves in that year were made for housing-related reasons; long-distance moves (migration) were made for work-related (31 percent) and family (25 percent) reasons.

Source: U.S. Bureau of the Census.

projections for West European countries suggest that women will shortly make up the largest part of their foreign-born population, and in one-third of the countries of sub-Saharan Africa, including Burkina Faso, Swaziland, and Togo, the female share of foreign-born populations was as large as the male. Further, among rural to urban migrants in Latin America since the 1960s, women have been in the majority.

Female migrants are motivated primarily by economic pushes and pulls. Surveys of women migrants in Southeast Asia and Latin America indicate that 50 percent to 70 percent moved in search of employment and commonly first moved while in their teens. The proportion of young, single women is particularly high in rural-to-urban migration flows, reflecting their limited opportunities in increasingly overcrowded agricultural areas. To the push and pull factors normally associated with migration decisions are sometimes added family pressures that encourage young women with few employment opportunities to migrate as part of a household's survival strategy. In Latin America, the Philippines, and parts of Asia, emigration of young girls from large, landless families is more common than from smaller families or those with land rights. Their remittances of foreign earnings help maintain their parents and siblings at home.

An eighth internationally relevant observation may be added to those cited in Ravenstein's list: On average, emigrants tend to be relatively well educated. A British government study reveals that three-quarters of Africa's emigrants have higher (beyond high school) education, as do about half of Asia's and South America's. Of the more than 1 million Asian Indians living in the United States, more than three-quarters of those of working age have at least a bachelor's degree. The loss to home countries can be draining; about 30 percent of all highly educated West African Ghanaians and Sierra Leoneans live abroad. Outward migration of the educated affects developed countries as well as poorer developing states. It is claimed that from 1997 to 2002, between 15 percent and 40 percent of each year's graduating classes from Canadian colleges emigrated to the United States, while in Europe, half the mid-1990s' graduating physics classes at Bucharest University left the country.

For modern Americans, the decisions to migrate are more ordinary, but individually just as compelling. They appear to involve (1) major life events (e.g., getting married, having children, getting a divorce, etc.); (2) changes in the career course (getting a first job or a promotion, receiving a career transfer, seeking work in a new location, retiring, etc.); or (3) changes of residence associated with individual personality (**Figure 3.33**).

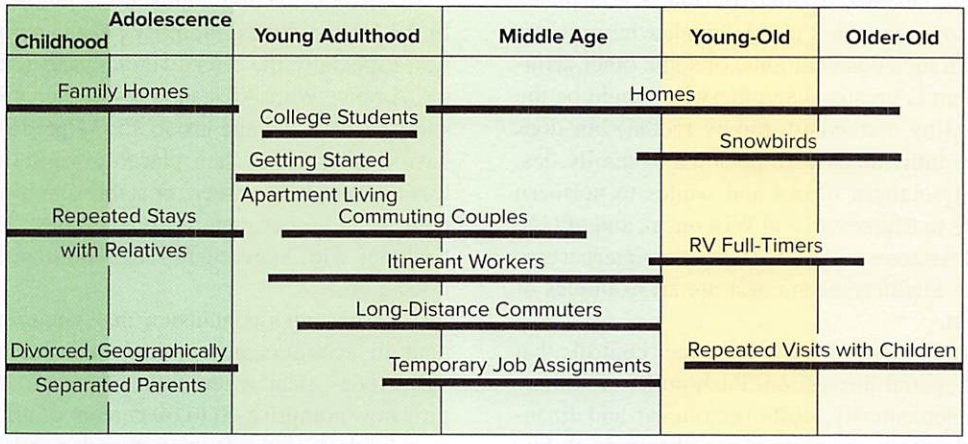


Figure 3.33 Examples of multiple residences by stage in life. Each horizontal line represents a period of time in a possible new residence.

Source: From K. McHugh, T. Hogan, and S. Happel, "Multiple residence and cyclical migration," The Professional Geographer *47(3), Figure 1, p. 253. Association of American Geographers, 1995.*

Gender and Migration

Gender is involved in migration at every level. In a household or family, women and men are likely to play different roles regarding decisions or responsibilities for activities such as child care. These differences, and the inequalities that underlie them, help determine who decides whether the household moves, which household members migrate, and the destination for the move. Outside the household, societal norms about women's mobility and independence often restrict their ability to migrate.

The economies of sending and receiving areas play a role as well. If jobs are available for women in the receiving area, women have an incentive to migrate, and families are more likely to encourage the migration of women as necessary and beneficial. Thousands of women from East and Southeast Asia have migrated to the oil-rich countries of the Middle East, for example, to take service jobs.

The impact of migration is also likely to be different for women and men. Moving to a new economic or social setting can affect the regular relationships and processes that occur within a household or family. In some cases, women might remain subordinate to the men in their families. A study of Greek-Cypriot immigrant women in London and of Turkish immigrant women in the Netherlands found that although these women were working for wages in their new societies, these new economic roles did not affect their subordinate standing in the family in any fundamental way.

In other situations, however, migration can give women more power in the family. In former Zaire (now the Democratic Republic of the Congo), women in rural areas moved to towns to take advantage of job opportunities there, and gain independence from men in the process.

One of the keys to understanding the role of gender in migration is to disentangle household decision-making processes. Many researchers see migration as a family decision or strategy, but some members will benefit more than others from those decisions.

For many years, men predominated in the migration streams flowing from Mexico to the United States. Women played an important role in this migration stream even when they remained in Mexico. Mexican women influenced the migration decisions of other family members; they married migrants to gain the benefits from and opportunity for migration; and they resisted or accepted the new roles in their families that migration created.

In the 1980s, Mexican women began to migrate to the United States in increasing numbers. Economic crises in Mexico and an increase in the number of jobs available for women in the United States, especially in factories, domestic service, and service industries, have changed the backdrop of individual migration decisions. Now, women often initiate family moves or resettlement efforts.

Mexican women have begun to build their own migration networks, which are key to successful migration and resettlement in the United States. Networks provide migrants with information about jobs and places to live and have enabled many Mexican women to make independent decisions about migrating.

In immigrant communities in the United States, women are often the vital links to social institution services and to other immigrants. Thus, women have been instrumental in the way that Mexican immigrants have settled and become integrated into new communities.

Nancy E. Riley, "Gender, Power, and Population Change," Population Bulletin 52, no. 1 (1997): 32-33. Reproduced by permission.

Work-related relocations are most important in U.S. long-distance (intercounty) migrations, and in both intra- and interstate relocations, more migrants move down the urban hierarchy—that is, from larger to smaller centers—than vice versa. Some observers suggest that pattern of deconcentration reflects modern transportation and communication technologies, more and younger retirees, the cost of housing, and the attractions of amenity-rich smaller places. Some people, of course, simply seem to move often for no discernible reason, whereas others settle into a community permanently. For other developed countries, a somewhat different set of summary migration factors may be present.

Globalization

We have seen how the cost of communication affects the degree of spatial interaction. Since the 1980s, the Internet and relatively low transportation costs have made it increasingly easy to buy goods from abroad and to travel throughout the world. There has been simultaneously a strong international movement to reduce barriers to trade and to foreign investment and ownership. For example, the creation of the European Union (EU) has dismantled restrictive national borders there, and its monetary unit, the euro, makes possible financial transactions in a single currency over a massive multinational common market.

Integration and interdependence characterize globalization and affect economic, political, and cultural patterns across the world. The unification of Eastern and Western Europe or the creation of regional trade alliances such as the North American Free Trade Agreement (NAFTA) in North America or Mercosur in South America is as much a function of the revolution in communication and computer technology as it is of the will of political or financial leaders. Low-cost, high-speed computers, communication satellites, fiber-optic networks, and the Internet are the main technologies of the revolution, with robotics, microelectronics, e-mail, cell phones, and more making their contributions.

The fact that a consumer in Italy can order a book from Amazon.com or clothes from Land's End, obtain news from CNN, or make an investment through the London Stock Exchange while talking on a cell phone to a colleague in Tokyo is revolutionary and proof that globalization brings about greater world integration and spatial interaction (**Figure 3.34**). The Web browsers built into even basic cell phones enable large numbers of people to be integrated into the global community. The cell phone's capacity for immediate voice, instant message, and Internet data transfer has made it an agent of universal globalization in the early 21st century.

International banking is a financial case in point with nearly instantaneous movements across borders of billions of dollars in response to changing foreign exchange values and investment opportunities. Split-second changes in all the interconnected markets are certain. Within minutes of the September 11, 2001, attacks on the World Trade Center, stock markets everywhere went down as investors sensed that the international marketplace was in danger of losing stability. Internationalization of finance is also demonstrated by the immense sums in foreign investments held by citizens of all countries. American ownership of foreign stocks and bonds directly or through mutual funds and pension plans, for example, tie citizens of this country to the economic institutions of distant areas; at the same time, people outside the United States have significant holdings in U.S. companies and in U.S. treasury bonds. The U.S. subprime lending crisis and housing price bubble collapse of 2008 led to financial crises and an economic slowdown around the globe.

Figure 3.34 The old and the new: A traditional gondolier in Venice, Italy, conducting business on a cell phone.

©Arthur Getis

Transnational corporations (TNCs), discussed more fully in Chapter 9, are important forces driving the globalization of the world economy. With headquarters in one country and subsidiary companies, factories, warehouses, laboratories, and so on in several others, some 65,000 transnational corporations control several hundred thousand affiliates worldwide and sell their multitude of products on the international market. TNCs, by some estimates controlling about one-third of the world's productive assets, exploit the large differential in wage rates around the world to keep production costs low, not only decentralizing manufacturing and other business activities internationally but also diffusing the infrastructure and technology of modern business and industry to formerly underdeveloped regions, integrating them more fully and competitively into the global economy. At the same time, many employment opportunities decrease for citizens of the developed countries where most of the owners and stockholders of the TNCs reside. It is interesting to keep in mind that in spite of globalization, the areal differentiation in wages and employment opportunities is proof that the world has not yet been made completely homogeneous by technologies.

The internationalization of popular culture is more apparent to most of the world's people than is the less visible globalization of commerce and industry. In widely different culture realms, teenagers wear Yankee baseball caps, Gap shirts, Levis, and Reeboks; eat at McDonald's; drink coffee at Starbucks; and listen to pop music on their iPod. The culture they embrace is largely Western in origin and chiefly American. U.S. movies, television shows, video games, software, music, food, and fashion are marketed worldwide. They influence the beliefs, tastes, and aspirations of people in virtually every country, though their effect is most pronounced on young people. Like the globalization of finance, industry, and commerce, this internationalization of popular culture is further evidence of the transformative nature and impact of modern spatial behavior and interaction.

AP KEY WORDS

Use the terms below with a ▮ to focus your study of AP Human Geography key words in this chapter.

activity space
▮ asylum seeker
attitude
awareness space
barrier
behavior
behavioral approach
▮ (Christaller's) Central Place Theory
▮ chain migration
channelized migration
cognition
▮ complementarity
counter (return) migration
critical distance
▮ dispersion
distance decay
First Law of Geography
forced migration
friction of distance
▮ gravity model
▮ guest worker
▮ internally displaced person
intervening opportunity
law of retail gravitation
link
▮ migration
migration field
mobility
movement bias
natural hazard
network
network bias
node
partial displacement migration
▮ pattern
personal communication field
personal space
place perception
place utility
potential model
▮ pull factor
▮ push factor
▮ Ravenstein's laws of migration
▮ refugee
Reilly's Breaking-Point Law
reluctant relocation
remittance
▮ rural-to-urban migration
▮ space
▮ space-time compression
space-time path
space-time prism
spatial interaction
spatial search
▮ step migration
temporary travel
▮ territoriality
time geography
total displacement migration
transferability
▮ transhumance
voluntary migration

AP TEST PRACTICE

Multiple Choice Questions

1. **Study Figure 3.3 on page 66. The reason people behave as they do when a new shopping mall opens is because**
   (A) the new mall is more modern and therefore would be cleaner and have nicer shops, so more people go to it.
   (B) the new mall is similar to the old mall, so there is no change in consumer behavior.
   (C) the new mall is closer and so more people will go to it.
   (D) people will continue to be loyal to the old mall that they have shopped at for years.
   (E) young people will go to the new mall, while older people will continue to shop at the old mall.

2. **The concept of space-time compression (or convergence) affected U.S. cities**
   (A) when cars and expressways were introduced in the first half of the 20th century, allowing goods to be more easily brought in from farther away.
   (B) when the use of modern time-keeping methods and time zones were introduced in the mid-19th century.
   (C) when commute times became longer due to traffic problems, making it necessary for commuters to live close to their work in the late 20th century.
   (D) when the development of supersonic transport made it possible for goods to be sent long distances extremely quickly.
   (E) when truck and rail shipments became more expensive, causing prices to rise in the inner cities.

3. **According to the gravity model,**
   (A) the amount of interaction between two cities is based on the amount of resources available in those places.
   (B) the amount of interaction between two cities is based on the distance between them.
   (C) the amount of interaction between two cities is based on the type of work done in each.
   (D) the amount of interaction between two cities is based on the size of the cities and the distance between them.
   (E) the amount of interaction between two cities is based on the available transportation.

4. **Each person's activity space includes all of the following EXCEPT**
   (A) territoriality, the emotional attachment to a specific place one sees as home.
   (B) a zone of privacy and separation of others, which is called personal space.
   (C) the area in which we go about our normal daily routine, which is our activity space.
   (D) the stage of life space, which differs depending on whether we are a child, an adult, or an elderly person.
   (E) the awareness space, or an individual's assessment of the possibility of locations outside the normal realm of activity.

5. **From a time-geography perspective, all of the following are true of women's lives EXCEPT**
   (A) women are frequently disadvantaged due to multiple work, child care, and home maintenance tasks.
   (B) women on average make more—though shorter—trips while men make longer but less frequent trips.
   (C) women face limitations in their choices of employment or other activities outside the home due to time-budget restrictions.
   (D) women who are single parents experience more constraints than do women who have other adults in the household to share tasks.
   (E) single women with no children experience the most time-budget restrictions.

6. **In cases of natural disasters such as floods and earthquakes,**
   (A) most people tend to resettle elsewhere.
   (B) most people make changes to their homes to make them safer.
   (C) most people tend to come back to their homes in spite of the danger.
   (D) most people migrate as far away as possible from the disaster area.
   (E) most people move away to live with family in other parts of the country.

7. **According to the map showing westward shift of the U.S. population in Figure 3.25 on page 83,**
   (A) for the first 50 years, data is not conclusive since the United States did not conduct a census.
   (B) westward expansion was slow in the first 100 years because methods of transportation were poor.
   (C) westward expansion sped up between 1890 and 1950.
   (D) the admission of Alaska and Hawaii to statehood in the 1950s caused a large shift to the west.
   (E) population growth in the Sunbelt had no effect on westward expansion because of a correspondingly large amount of immigration to the East Coast.

8. **The millions of Soviet citizens who were required by their government to move from rural areas to cities for factory work or from western Russia to labor camps in Siberia are examples of**
   (A) international migration.
   (B) refugees.
   (C) forced migration.
   (D) pull factors.
   (E) guest workers.

9. **Ravenstein's laws of migration state that**
   (A) most migrants go only a short distance.
   (B) most migration proceeds in one long step.
   (C) migration is mainly urban to rural areas.
   (D) migration only flows one way.
   (E) most migrants come into a country illegally.

10. **An effect of gender on migration is that**
    (A) women usually decide where the migrating family will go.
    (B) studies show that women from countries where they are subservient to men tend to stay subservient, even when they move to a country where they have more freedom.
    (C) an equal number of men and women migrate.
    (D) migrants rarely bring their families with them but prefer to send money home instead.
    (E) migration to a developed country gives women fewer economic opportunities and more rights.

Free Response Questions

1. **Answer Parts A, B, and C below.**
   (A) Define *external migration* and *internal migration*.
   (B) Give examples of external migration and internal migration in North America and South America.
   (C) Explain two main causes of migration and give examples of each.

2. **Answer Parts A, B, and C below.**
   (A) Define *push factors* and *pull factors*.
   (B) Explain examples of economic, social, and environmental factors of migration.
   (C) Give an example and explain a political barrier to migration.

3. **Explain the effects of globalization on retail trade, international banking, transnational corporations, and popular culture.**