6 How global is international mobility?[1]

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INTRODUCTION

How global is international mobility? The answer to this short question has—despite its seeming simplicity—been obscured by how the issue of international mobility was treated in parts of the social sciences. There has been a tendency, particularly in globalization research, to argue that physical space has a lessening or even vanishing role in structuring human activity and that *all* international mobility tends to be global. For example, in the 1970s, Toffler (1970: 91) talked about the "demise of geography", alleging that in contrast to the nomads of the past who were bound by place, "the new nomads of today leave the physical structure behind". Similarly, Held and McGrew (2003: 3) argued that "the constraints of social time and geographical space, vital coordinates of modern social life, no longer appear to impose insuperable barriers to many forms of social interaction or organization". Numerous other terms, such as "time-space compression" (Harvey 1989), "collapse of space" (Kirsch 1995), "shrinking world" (Allen and Hamnett 1995), "deterritorialization" (Appadurai 1996), "collapse of time and distance" (Koehn and Rosenau 2002: 105), and "increasing emancipation from space" (Schroer 2006) have been proposed to describe the very matter.

In international relations, too, a classic perspective simply equates international and transnational mobility with global mobility. Nye and Keohane (1971: 332), e.g., state: "In the most general sense one can speak of 'global interactions' as movements of information, money, physical objects, people, or other tangible or intangible items across state boundaries." From this perspective, then, any move that crosses a national border is by definition "global". Similarly, in sociological theory, prominent approaches have not differentiated between regional and global scales of interaction (e.g., Giddens 1990: 64). Doing so, however, can be highly problematic because it renders invisible that—as we will see—a large share of international mobility actually occurs between neighboring countries and within world regions and is thus better described as regional rather than global mobility.

Just how global international mobility actually is thus remains an empirical question. In this chapter, we provide answers which lead us to argue that accounts treating basically all international mobility as global are misleading. The lion's share of all international mobility takes place at nearby distances at the world-regional scale. Only a small share of all mobility is actually global. We will show that a mathematical model, the Lévy-flight or *power-law* model is very good at describing the precise shape of this pattern. An extension of this model can even predict differences between the spatial structures of different types of international mobility. We demonstrate this empirically with data on international tourism, refuge-seeking, migration, and student mobility. In a further step, we explore whether and how the first year of

[1] The sections "Introduction", "State of Research and Theory", and "Empirical Patterns: The Macro Perspective" draw on text material and figures previously published in Deutschmann (2016a) and Deutschmann (2021).

the COVID-19 pandemic affected the spatial structure of international mobility, revealing that this global shock did indeed alter the average distance people moved internationally—at least temporarily. Of course, mobility patterns also look different for individuals from different backgrounds. To better understand the extent to which a number of social factors influence how globalized people's movements are, we then go beyond the macro-perspective and look at the impact of various social characteristics such as education, age, occupation, and gender via the micro-level-based space-set approach. We end with a discussion and outlook.

STATE OF RESEARCH AND THEORY

In contrast to the accounts from globalization research, international relations, and sociological theory described above, other research has taken the role of space in structuring mobility more seriously. A classical statement in this regard is Tobler's *First Law of Geography*, which states that "everything is related to everything else, but near things are more related than distant things" (Tobler 1970: 236). Other central terms are the "principle of least effort" (Zipf 1949) and "distance decay". With respect to human mobility, Ravenstein (1885) realized that the large majority of migrants in nineteenth-century England only moved short distances while few migrants moved long distances. Later, Stouffer (1940) presented graphically a spatial distribution of US family movements that featured a heavy tail, meaning that most movements covered short distances and only few moves went over long distances. In the early 1950s, Hägerstrand (1967) examined the spatial structure of migration (and phone calls) in two Swedish districts and found similar distributions.

Concerning *international* mobility, the central structuring role of geographical distance has been recognized in a number of empirical studies (Brams 1966; Clark and Merritt 1987; Choi 1995). McKercher et al. (2008) used the concept of "distance decay" in relation to international tourism. Focusing on 41 countries, they showed that 80 percent of all international travel occurs to countries within 1,000 km distance. Migration researchers, too, have repeatedly recognized that migration primarily occurs within world regions (e.g., Abel and Sander 2014; Sander and Bauer 2015; Mberu and Sidze 2018).

Two explanations have been put forward as to why human mobility is affected by geographic space (cf. Miller 1972; Noulas et al. 2012). The first one, the *gravity* hypothesis, is inspired by Newton's law of gravity and states that costs connected to distance itself are responsible for fewer long-distance movements (Deutsch and Isard 1961: 308; Zhou 2011: 197). The second one, the *intervening opportunities* hypothesis, argues that it is not the costs of distance itself that matter, but intervening opportunities that allow one to fulfill one's needs already at close distances, making long-distance mobility unnecessary (Stouffer 1940; Freymeyer and Ritchey 1985).

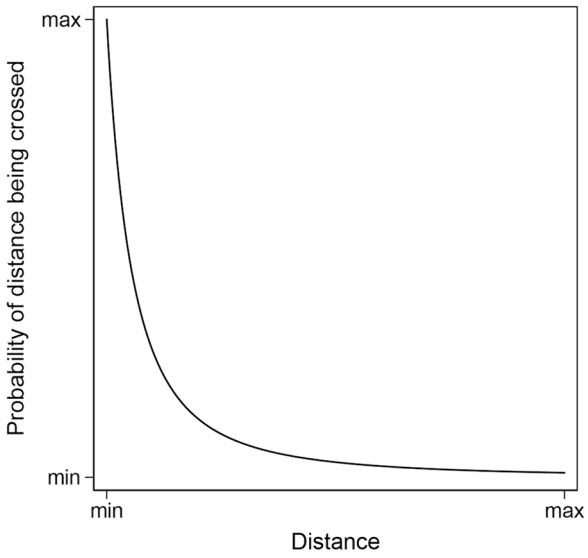
Encompassing analyses of the precise shape of the relation between distance and various types of human activity at the global scale is also missing in this "distance-decay debate". For a more precise understanding, we can turn to the Lévy-flight model, which has been used in the natural and complexity sciences to model the mobility behavior of many animal species, including jackals, sea turtles, and sharks.

The Lévy-flight Model

A hungry shark searching for prey in the ocean will frequently move short distances, interrupted by random changes of direction that are only occasionally followed by moves over longer distances. Ecologists, who are interested in understanding the mobility patterns of sharks and other animal species, have found a way to simulate such movement traces using a mathematical model called *Lévy flights*. A Lévy flight is a random walk (i.e., a succession of steps into random directions) in which the step-lengths feature a heavy-tailed probability distribution (Shlesinger and Klafter 1986) that follows a power law. In empirical research, Lévy flights are usually diagnosed by "showing that the power-law distribution holds" (Buchanan 2008: 715). Mathematically, the power-law relation between two quantities y and x can be defined as

$$y = ax^{\beta},$$

where a is a prefactor and β is the scaling exponent, which determines the steepness of the curve.[2] In our case, x is the physical distance of a move across space, and y is the probability of such a move to occur. Drawn graphically, such a relation looks as shown in Figure 6.1: The probability of a spatial move to occur is highest at very short distances and then drops rapidly with increasing distance and ends in a long tail of very few movements over very long distances.



Source: Author's own elaboration

Figure 6.1 Ideal-typical representation of a power-law pattern of spatial mobility

[2] Power laws are a common phenomenon in the social and natural world and have been shown to exist in phenomena as diverse as the gamma-ray intensity of solar flares (Clauset et al. 2009), the sizes of strike waves (Biggs 2005), or the distribution of accusations between prisoners (Deutschmann 2016b).

Ecological research has shown that such Lévy-flight-like mobility patterns, with power-law distributions of step lengths sorted by frequency, occur not only in the foraging movements of sharks and other marine predators like sea turtles and penguins (Sims et al. 2008), but also in the motion of mammals like spider monkeys (Ramos-Fernández 2004), jackals (Atkinson et al. 2002), and smaller species like plankton (Bartumeus et al. 2003). But does this model also hold for human mobility?

Past research by natural and complexity scientists that has looked at local (González et al. 2008; Song et al. 2010; Rhee et al. 2011; Noulas et al. 2012) and nation-wide human mobility (Brockmann et al. 2006) has indeed found Lévy-like patterns. These studies followed students on university campuses, volunteers in theme parks and state fairs, cabs on their journey through a city, or bank notes travelling through the United States. Two studies (Cheng et al. 2011; Noulas et al. 2012) showed that logins to location sharing services (LSS) like Foursquare also follow a Lévy-flight pattern on a global scale. Deutschmann (2016a; 2021) demonstrated that this pattern also holds for various forms of international mobility between countries worldwide, including migrants, tourists, asylum-seekers, and refugees.

The finding that the Lévy-flight model is not only able to capture displacements of foraging animals, but also to describe how humans and their messages travel around the world, raised new questions about the aptitude of existing theorems. The most influential theoretical argument for these Lévy-flight patterns is *random search optimization theory*. It has been argued that in environments where food is scarce, a power-law distribution of flight lengths with a scaling exponent $\beta = 2$ is the optimal search strategy (Viswanathan et al. 1999). This $\beta = 2$ hypothesis has been highly influential, and scholars have tended to compare their empirically found coefficients to this theoretical ideal (e.g., Bartumeus et al. 2003; Sims et al. 2008). However, there are some doubts about the universal practicability of the $\beta = 2$ argument.[3] Most importantly, the $\beta = 2$ argument has little to say about motion patterns of humans, who are generally not foraging in the strict sense and who do not usually walk into random directions but consciously decide where to go based, for example, on cultural preferences and information about their environment (Song et al. 2010; Rhee et al. 2011). Hence, new explanations are needed.

Expanding the Lévy-flight Model to Cover Human Mobility

A first expansion of the Lévy-flight model to account for different types of human mobility across borders was presented in Deutschmann (2016a; 2021). This "comparative theory of transnational human mobility's spatial structure" allows us to develop hypotheses about how various types of international human mobility should differ in terms of their spatial structure, building on the general assumption of a Lévy-like power-law pattern. Remember that the precise shape of such a power-law curve is determined by the scaling exponent β: A larger β means that the curve is steeper, i.e., relatively more activity occurs at short distances, whereas a smaller β denotes a flatter relation, i.e., relatively more activity takes place over longer dis-

[3] The appeal of this constant reminds us of Vilfredo Pareto's presumption of having found a universal law of distribution by which log N = const-α (log X), where N is population size and X is the average value of the asset (e.g., wealth). According to Pareto, α was universally 1.5, whatever the population or the asset at stake. Such a claim was soon falsified by scholars like Pigou and Gini (Alacevich and Soci 2018: 55 ff.).

tances. The theory expects β and the fit of this power-law function (measured by an R^2, which can range from 0, indicating no fit, to 1, indicating a perfect fit) to vary by type of mobility.

For international mobility, the argument, which is inspired by the distance-decay debate (and in specific the intervening-opportunities hypothesis), is the following.

If we accept the assumptions that

(i) International mobility is associated with type-specific goals,
(ii) the availability of opportunities for goal-attainment varies by goal
(iii) the average amount of resources available to attain goals varies by mobility type,
(iv) humans aim at spending as little of their resources as necessary to attain their goals,

then the spatial structure of a specific type of mobility *i* can be expected to be determined by two factors: the availability of opportunities for attainment of the goals associated with *i* and the resources available on average to the individuals engaging in *i*. The broader the availability of opportunities for goal-attainment, the higher is the likelihood for individuals to stop their movement at closer locations (and thus the higher R^2 and β), because their needs are already fulfilled to a satisfying extent and any further movement would only diminish the stack of resources without leading to additional benefits. Similarly, the higher the average amount of resources available to the group of people engaging in a particular type of mobility, the less they will be physically bound by the costs of mobility (and thus the lower R^2 and β), *ceteris paribus*.

These considerations allow us to delineate specific expectations for various types of mobility, including the ones we will have a closer look at in this chapter: migration, tourism, refuge-seeking, and student mobility. Major goals commonly associated with refuge-seeking are mere survival, fulfillment of basic needs, and security. These goals can usually be achieved in many places, oftentimes already in neighboring countries just outside a warzone, locality of oppression, or natural disaster scene. The resource stock available to refugees and asylum-seekers tends to be rather low. As a result, the spatial structure of refuge- and asylum-seeking is expected to feature a high power-law fit and scaling exponent. Tourists are usually interested in a pleasant environment (if on holidays) or in business opportunities (if on business trips). Both are widely available in many countries around the world (and easier to pursue in closer ones, e.g., due to cultural similarity), but tourists are likely to possess more resources on average than refugees. Therefore, R^2 and β should still be high for tourism but slightly lower than for refuge-seeking. Migrants are often interested in improving their economic well-being, which is quite stratified globally and although moving short distances may already result in relative improvements, moving a bit further may in many cases still lead to additional benefits.[4] Migrants are also likely to possess more resources on average than

[4] Migrants are a particularly large group of people with diverse sets of attributes. Some of them are high-skilled experts, whom some countries actively seek to attract, while others are low-skilled, untrained workers, who often have to cross borders illegally. The migration data used here does not allow to differentiate between such skill types, but in theory this is of course possible. The larger resource stock of high-skilled migrants (in terms of financial, human, and social capital), as well as the more dispersed opportunity structure for getting highly-paid knowledge-based jobs compared to the broad availability of low-paid untrained work suggests that they are less bound by gravity (which should result in lower R^2 and β values) than low-skilled migrants. It would be interesting to see this hypothesis tested in future work. For an analysis of how different motives for internal migration (employment, family, housing, etc.) are related to the distance of the move within three countries, see Thomas et al. (2019).

refugees, so that overall we expect a medium R^2 and β. International students tend to aim for excellent education and social distinction, which is best available only in a small number of institutions in a select number of countries, as the global university system is highly stratified (Barnett and Wu 1995). In theoretical terms, this stratification leads to a lack of intervening opportunities: students cannot just go to neighboring states but have to reach countries like the United Kingdom or the United States to attain their goals. Therefore—and because international students tend to be comparatively well-endowed economically on average—one would expect low R^2- and β-values for student exchange (Deutschmann 2016a; 2021).

If we go from the aggregated patterns of all individuals globally that engage in a specific type of mobility to a micro-perspective that differentiates between people with different social characteristics, further considerations can be made. Clearly, the average amount of resources available (cf. assumption iii above) to an individual is highly likely to affect their mobility behavior. People who are better off (e.g., because they have well-paying jobs) will likely travel more and over longer distances than those with fewer economic means. In addition, other socio-cultural factors will influence how global one's movements are. In some cultures, for example, men might have a larger mobility radius than women, because of a lower commitment to parental and domestic chores. Age might have a curvilinear relationship with how far people travel: we begin our journey through life as immobile infants, become more mobile as we grow up, explore the world, go further and further before becoming immobile again in old age. Moreover, prior personal long-distance ties might have an influence. A descendent of migrants from Chennai who resides in Canada but remains attached to kin in India will likely have more long-distance moves in their trajectory than a native Canadian without migration background. This is of course not a definitive list, but it illustrates that socio-cultural factors will shape how global the mobility patterns of different social groups are.

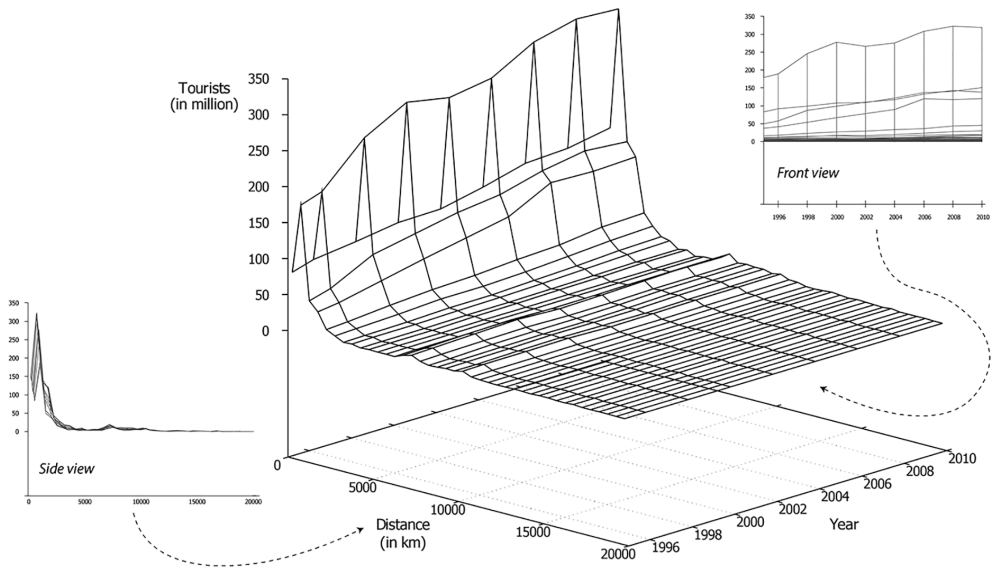
To test whether these assumptions about the spatial structure of international mobility hold in the real world, we will now first have a look at the empirical picture from a macro, planet-scale perspective (different mobility types) before switching to the micro-perspective and exploring the role of a set of social factors (age, gender, occupational class, migration background, etc.) based on individual-level data from France and Italy.

EMPIRICAL PATTERNS: THE MACRO PERSPECTIVE

Let's now approach the question of how global international mobility actually is empirically. To begin, we can look at the spatial structure of tourism as one particular type of international mobility. Figure 6.2 illustrates this structure, based on tourism flows between 196 countries,[5] in its development between 1995 and 2010. The vertical axis displays the number of tourists (in million), the first horizontal axis shows the distance crossed (ranging from 0 to 20,000 km—equivalent to travelling to the opposite side of the planet), and the second horizontal axis indicates the year (ranging from 1995 to 2010, the timeframe for which data is available). The

[5] This analysis is based on international tourism data from the World Tourism Organization (UNWTO). The chosen indicator is "tourist arrivals", which implies that the reported numbers are not equivalent to individual persons traveling, since the same person can arrive at the same destination as a tourist multiple times per year. Furthermore, tourism in this context is not restricted to holiday trips since business travels are also included.

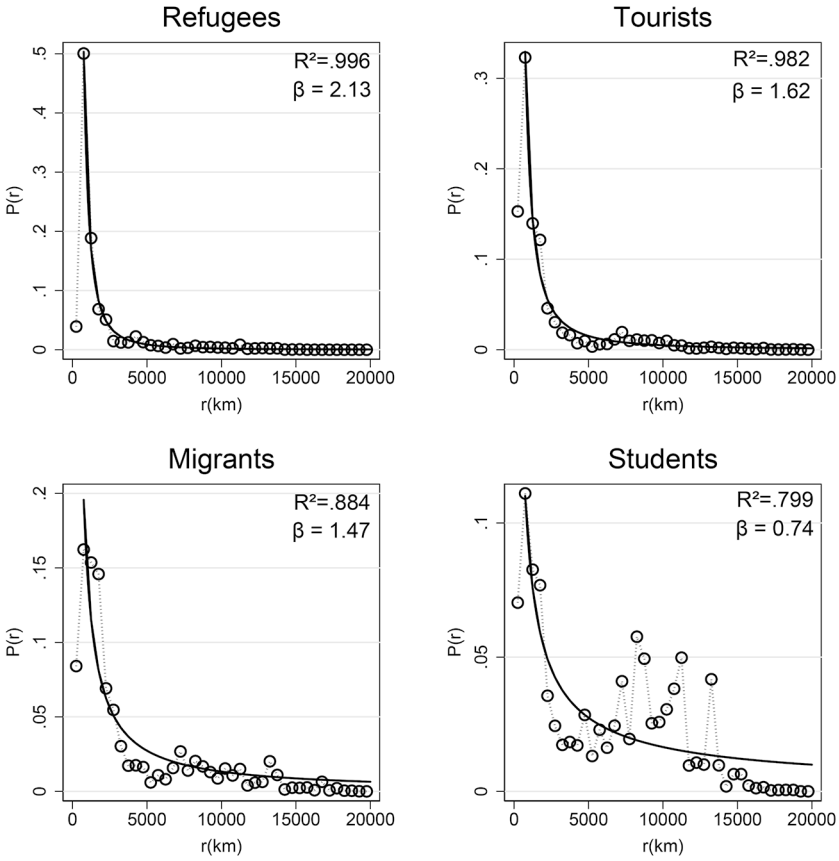
resulting distribution of observations (i.e., the grid) looks a bit like a carpet, with one end (to the right) lying flat on the ground while the other end (to the left) is hung on an imaginary lopsided clothesline. In the middle, there are a few untidy bumps, as if the conceived person hanging up the carpet for drying had not been too diligent. As observers, we can approach this "carpet" from several directions. The view from the front (right inset in Figure 6.2) reveals the development over time and shows that the absolute number of tourists has increased over the years. Or, to remain within the carpet metaphor: the slanting clothesline reaches from a much lower position on the left (1995) to a higher one on the right (2010). The view from the side (left inset), by contrast, reveals the spatial structure and its astonishing stability over time: Most transnational tourism occurs over quite short distances, becomes rare quite quickly as the kilometer count rises, and hardly occurs at all over very long distances, resulting in a flat right half of the carpet. Perhaps most surprising is the fact that (except for very short distances) the lines representing the different years are almost perfectly congruent in this side view, indicating that despite the absolute growth in tourist numbers, the spatial structure is very stable over time.



Source: Deutschmann (2021).

Figure 6.2 The spatial structure of international tourism, 1995–2010

This carpet graph is already quite revealing and hints at two fundamental patterns that will accompany us throughout this chapter: (a) a strikingly steep decline of the probability of international mobility to occur after a peak at relatively short distances with almost no mobility taking place at very long distances, and (b) a remarkable stability of this distinctive spatial structure over time. To assess these patterns more systematically, we can draw on the power-law approach described above.



Note: Based on international mobility between 196 countries worldwide. r = distance; P(r) = probability of a move across a certain distance r to occur; circles = binned empirical observations; dotted line = connected binned observations; solid line = best-fitting power-law curve; R^2 = fit of the power-law curve to binned empirical observations; β = scaling exponent of best-fitting power-law curve.
Source: Adapted from Deutschmann (2016a; 2021).

Figure 6.3 The spatial structures of four types of international mobility

Figure 6.3 shows the spatial structure of four types of mobility, including tourists, but also migrants, refugees, and students.[6] Dots represent the binned empirical observations while the solid lines depict power-law curves fitted to the empirical distributions' tails. The goodness-of-fit is indicated by the R^2 in the upper right corner (again, 0 = no fit, 1 = perfect fit), by which the subgraphs are sorted. The scaling exponent β, placed below the R^2, indicates the steepness of the power-law curve, as described above. The power-law fit is highest for

[6] Based on the same tourism data as above (UNWTO 2014), migration data from the United Nations (UN 2012), refugee data from UNHCR (2013), and student data from UNESCO (2010).

refuge-seeking (R^2 = .996), and just slightly lower for tourism (R^2 = .982), and migration (R^2 = .931). Only for student exchange does the power law not fit the empirical distribution well (R^2 = .799). The spatial structure of student exchange differs from that of the other activity types in that there are several significant peaks at middle-range distances (approx. 7,000–14,000 km). A closer look reveals that these peaks result mainly from extraordinarily large flows of students from China, India, and South Korea to the United States, the United Kingdom, and Australia (Deutschmann 2021: 143). This fits our assumption about the role of the global university system's heavy stratification and the related lack of intervening opportunities as the main mechanism behind this exceptionality of student mobility.

The scaling exponent β is highest for refuge-seeking (β = 2.13), medium-high for tourism (β = 1.62), medium for migration (β = 1.47), and small for student exchange (β = 0.74). Thus, the theoretically expected order holds, indicating that type-specific goal-attainment opportunities and available resources do indeed help predict spatial structures of human mobility across nation-state borders. Since tourists and migrants encompass a lot more people than student exchange, international mobility as a whole clearly follows a power-law-like spatial structure.

Developments Over Time

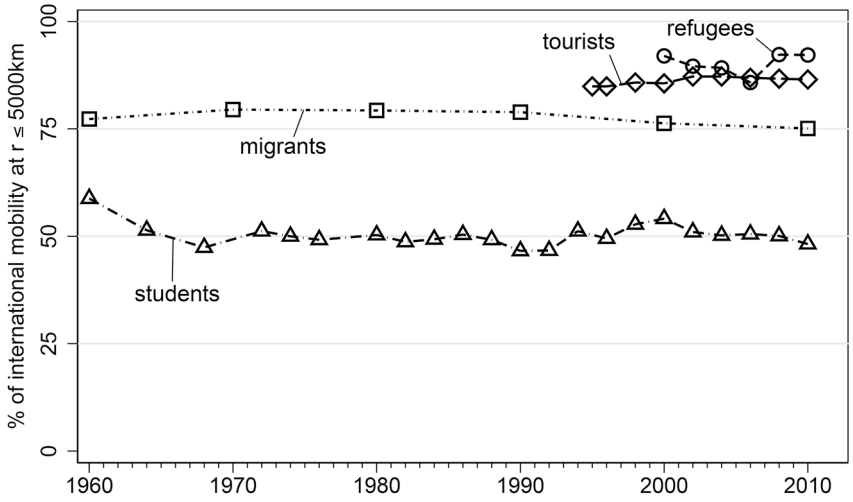
Are there any changes in this structure over time? Based on one of the most comprehensive sources on international mobility, the GMP Global Transnational Mobilities Dataset (Recchi et al. 2019), which covers more than two billion estimated international trips a year between 2011 and 2016, 80 percent of all international mobility occurs within world regions, and only 20 percent between them (Deutschmann 2020).[7] What is striking is that in each and every year between 2011 and 2016, this value remained at *exactly* 80 percent, despite enormous growth in international mobility in this time frame (annual growth rate: 4.8 percent).

This finding of structural stability also holds for longer time periods and when we look at specific types of mobility. Figure 6.4 illustrates, for the four types of mobility already analyzed before (students, migrants, tourists, and refugees), the share of international mobility that takes place within the first 5,000 km from the country of origin. This constitutes a range of about a fourth of the maximum possible distance on planet Earth and can thus be seen as regional (as opposed to global).[8] The figure reveals two things: First, the share or short-distance mobility is type-specific: whereas only about half of all students move short distances, this is true for approximately three out of four migrants, 86 percent of tourists and 90 percent of refugees. Second, this type-specific share is very stable over time. For students, it fluctuates around the 51-percent mark over a period of half a century. Thus, there is no clear evidence for meaningful shifts in the relative degree of regionalization or globalization in any of the four types of mobility, despite enormous growth in the number of people moving over time. Overall, *international mobility was, is, and remains regionalized.* (It is important to remember that

[7] In this study, five world regions were differentiated when calculating intra- and interregional mobility shares: Africa, Americas, Asia, Europe, and Oceania.

[8] The specific size of this threshold is, of course, arbitrary. For additional analyses based on alternative indicators, see Deutschmann (2016a). For approaches that acknowledge that the sizes of specific world regions differ and that thus look at the degree of regionalization and globalization comparatively across concrete world regions over time, see Deutschmann (2019; 2021). While these nuanced alternative approaches allow for additional insights, they also support the main message that we intend to communicate here: that by and large, international mobility is quite stable in its regionalized structure.

students, who feature the most globalized movement pattern out of the four types of persons under study, are only a small share of all internationally mobile people.)



Source: Based on Deutschmann (2016a; 2021), cf. these references for details about the data sources.

Figure 6.4 *Longitudinal trends in spatial structures of international mobility, 1960–2010*

This general finding of structural stability does, however, not necessarily hold for *all* specific types of mobility. Gomez et al. (2020) find that the moves of *scientists* for professional stays abroad have become more regionalized over time. Based on 116,400 ORCID profiles, they show that between 1980 and 2015, the distance that scientists travel for international moves has become shorter. The share of intra-regional as opposed to interregional (= global) mobility[9] has increased continuously, from about 15 percent in 1980 to about 30 percent in 2015. Thus, scientists are, in comparison to other groups and types of mobility, an exception in two ways: (a) in that their international moves have become more regionalized over time, and (b) in that a large majority of their moves (approximately 70 percent) remains global.

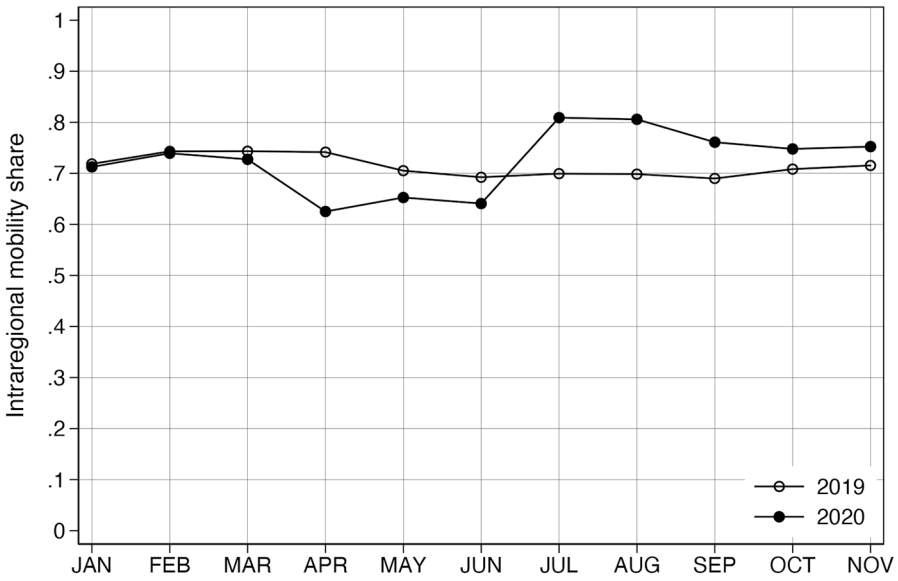
Changes During the COVID-19 Pandemic

How robust is the spatial structure of international mobility to the massive shock of a global pandemic? We tackle this question using air traffic data for a set of 28 countries globally. Figure 6.5 shows, for each month in 2019 and 2020 (except December), the share of mobility that takes place within world regions (as opposed to between them). While the mere *quantity* of air passengers fluctuates widely throughout the year due to seasonal effects (cf. Gabrielli et al. 2019), Figure 6.5 shows that in a "normal", non-pandemic year such as 2019, the share

[9] Gomez et al. (2020) differentiate between six regions in their study: Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania.

of mobility that is intraregional (as opposed to interregional)[10] is very stable, at about 70 percent. Only in the period from February to May 2019 was there a slight rise to about 74 percent. In 2020, by contrast, the picture changes: Whereas in January and February, before the global outbreak of COVID-19, the intraregional mobility share still follows precisely the 2019 pattern, the two lines begin to diverge as the pandemic spreads. First, at the height of the first wave, in April, May, and June 2020, the share of intraregional mobility is significantly *lower* than in non-pandemic times. However, during July and August, and to a lesser extent in the months that followed, the share of intraregional mobility became disproportionally *high*.

A possible explanation—which we are only able to suggest, not prove here—is the following: at the height of the first wave (April-May), non-essential, vacation-related air traffic was drastically reduced, while unavoidable, business- and crisis-related long-haul flights remained in existence to a disproportional extent (possibly for repatriations as well as transnational ties of critical or powerful personnel: health specialists, diplomats, elites). After the first wave, in the summer of the northern hemisphere (July-September), people took the period of comparatively low incidences as an opportunity to go on vacation, now preferably via short distances to nearby countries. In Europe, in particular, the EU deliberately aimed at revamping intra-European mobility while keeping external borders sealed (Thym and Bornemann 2021).



Note: Original visualization based on international air passenger traffic between 28 countries.

Figure 6.5 *Intraregional air passengers as a share of all international air passengers, 2019–2020*

[10] Here, six regions were distinguished when computing this share: Africa, Asia, Europe, North America, Oceania, and South America.

The overall impression is that the change during the pandemic compared to normal times is (a) limited in its extent, (b) not unidirectional, and (c) temporary. Regarding (a): the deviation from the same month one year earlier only reached a maximum of -11.6 percentage points (March) and +10.9 percentage points (July). While this change is definitely significant and meaningful—seasonal fluctuations are much smaller during a normal year as the 2019 line reveals—it is still relatively moderate. While the mere *number* of passengers in the set of countries under study dropped starkly, by 75 percent in April 2020 compared to April 2019, the shifts in the spatial structure are rather small in comparison. Regarding (b), it is noticeable that the increase in regionalization (July-November) basically "neutralizes" the prior increase in globalization (April-June). The mean change in regionalization across the 11 months of the two years for which we have data is only +1 percentage points, and thus negligible. An impact of the COVID-19 pandemic is thus only visible at the monthly resolution, whereas the yearly average share of intraregional mobility is about the same as in pre-pandemic times. Regarding (c), it looks like after two swings, first down, then up, the 2020 line begins to slowly converge with the 2019 line again. A pandemic wave thus seems to have only a temporary effect on the otherwise quite stable, regionalized structure of international mobility. Future data (ideally also in combination with more data from the past) will have to be examined to confirm or refute this impression.

The analysis was conducted as part of the Airport Factor project (https:// m igrationpo licycentre .eu/ projects/ global -mobilities -project/ #airport), drawing on Sabre Travel Data, a private company dataset on airport traffic based on data collected directly from the airline industry (https://www.sabre.com/products/travel-data/).

EMPIRICAL PATTERNS: THE MICRO PERSPECTIVE

The analyses presented so far highlight the broad picture of human mobility across state borders globally. Flows refer to the aggregate behaviors of hundreds, thousands, or even millions of people moving along the same trajectory by time unit (months or years). These movements are, to be more precise, *events* that can even be repeated by the same individuals—think of commuters and frequent flyers. But what do we know about the social differentiation of international mobility practices? In other words, *who* travels *where*, *when*, and *how*? Systematic answers to this question are scant in the literature.

In principle, recent development in big data—particularly, geo-spatial tracking of smartphones—can yield individual-level maps of mobility at an extremely high level of granularity. Studies indeed exist locally or country-wise (e.g., Phithakkitnukoon et al. 2012; Deville et al. 2016), but are technically more difficult when it comes to international travels due to roaming issues. While promising, this line of research faces two hurdles. The most serious is ethical. Smartphone tracking is very intrusive and privacy issues are more severe than in other forms of social science data collection. When geospatial tracking is linked to information like gender, age, occupation, or income, personal identities can be fully exposed (Thompson and Warzel 2019; Drouhot et al. forthcoming). Extra warranties and informed consent should be put up front, much like in public opinion surveys on sensitive topics. The second obstacle is that international mobility events are relatively rare in an average individual's biography. Except for select populations (for instance, residents of border regions or workers in the transportation industry), the experience of crossing a border is not that recurrent, maybe no more

than occasionally in a lifetime, and is thus hardly captured by time-censored data like phone pings recorded over a month or two.

An approach that, conceptually and technically, addresses the issue of drawing the map of individual geographies of travel is research on 'space sets' (Recchi 2013; Recchi and Kuhn 2013; Recchi 2015: 150-153; Recchi et al. 2021). 'Space sets' are defined as the whole of geographical places where individuals happen to be during their life. This concept resonates with Torsten Hägerstrand's 'time geography' (Hägerstrand 1967; Pred 1984; Lenntorp 1999), but it adds to it an emphasis on the lifecourse embeddedness of mobility. Operationally, space sets correspond to maps of the personally experienced world. This notion embraces all forms of human mobility, usually treated separately in the literature—like tourism, residential mobility, student, or work migration. Its goal is to make sense of the social structuration of mobility.

We distinguish three layers of space sets, depending on the time spent in each place: *cognitive* (including all places visited, no matter how long), *experiential* (including places where Ego stayed at least one week) and *residential* (for stays of at least three months, when Ego has to set up a 'home'). Focusing on the international facet of space sets, we can then compute their *size* (number of countries visited) and *range* (farthest distance travelled). Additional dimensions of space sets are conceivable, but these suffice for the economy of this chapter.

Data on space sets can be collected through social survey tools, provided they incorporate a visualization of geographical maps—better if interactive. This was the case in two ad hoc surveys carried out in Italy and France in 2015-16, using the same questions and very similar visualization tools of national and global maps. In Italy, the *Mobilità* study relied on the DOXA permanent panel (1,004 respondents, representative of the Italian resident population by gender, age, and education); in France, the study *Mobilités et rapport à l'espace dans le cycle de vie* was administered through the ELIPSS panel (698 respondents, weighted by gender, age, and education). In both cases, the questionnaire aimed at reconstituting retrospectively and exhaustively individuals' travels over their lifecourse.

Results of these two surveys are astonishingly similar, although the French tend to have a somewhat larger practice of mid-duration trips (see Table 6.1). All in all, both Italian and French residents have a limited first-hand experience of continents other than Europe. In spite of being rich countries in global comparison, half of the Italian and French population have visited no more than four foreign countries in their life. Approximately one person in seven to eight has never been abroad in their life (16.9 percent in France, 12.5 percent in Italy); one person in four has never been abroad for more than one week (28.2 percent in France, 27.7 percent in Italy). Longer stays abroad are even rarer, and when they occur, they are more likely to be at closer distance, thus echoing the findings of macro analyses. Overall, the size and range of space sets follow a consistent trend. On the one hand, the farther the destination, the less likely it is; on the other, the longer the stay, the closer the place.

Neighboring countries take the lion's share of all travels and stay. For Italians, France and Spain are the two most commonly visited countries; for the French, these are Spain and Italy. Germany and the UK follow as most common destinations in both cases. Equally, for both the French and the Italians, of the ten most visited countries, only one—the USA—lies out of the European or Mediterranean space. Outside of Europe and the Mediterranean basin, the only two countries that have been visited by more than five percent of Italians are the USA and Canada. For the French, these outliers (visited by more than five percent of respondents) also include Mexico, Thailand, and Senegal. These countries represent, in a sense, the global outposts of highly Europe-centric space sets. Note that large countries like China, India, Russia,

Table 6.1 Size and range of the space sets of French and Italian residents: median, mean, and standard deviation (in parenthesis)

Dimension	France	Italy
Cognitive size (countries visited)	4	4
	6.0	6.1
	(6.6)	(6.5)
Experiential size (countries visited > one week)	2	1
	3.8	2.7
	(4.6)	(3.7)
Residential size (countries stayed > three months)	1	1
	2.4	2.1
	(2.9)	(3.0)
Cognitive range (farthest distance travelled, in km)	2,078	1,899
	4,252	4,118
	(4,203)	(4,221)
Experiential range (farthest distance > one week, in km)	1,634	1,484
	3,900	3,471
	(4,276)	(4,183)
Residential range (farthest distance > three months, in km)	962	1,173
	2,017	1,952
	(2,862)	(2,931)

Note: N (FR) = 698; N (IT) = 1,004. Distances are computed between the largest airports in the countries of origin (France or Italy) and destination.

Table 6.2. The sociodemographic determinants of the range of cognitive international space sets (farthest distance ever travelled) of French and Italian residents

		France	Italy
Gender	Ref = Woman	.060	.070*
Age	Ref = less than 25 years old	.176**	.075
	25–34 years old	.143*	.184**
	35–44 years old	.223**	.179**
	45–54 years old	.416**	.097*
	55 years old and more		
Education	Ref = lower than tertiary	.231**	.112**
Occupation	Ref = manual worker	.015	.163**
	Routine white collar	.063	.058
	Self-employed, small employer	.183**	.173**
	Manager and professional		
Immigrant status	Ref = Born in France/Italy	-.044	.007
Foreign origins	Ref = Both parents born in France/Italy	.064	.057
N		698	1,004
R^2		.168	.088

Note: OLS regressions with standardized beta coefficients. ** p<.01; * p<.05

Brazil, or South Africa are absent from the space sets of almost all our respondents—what people know about them comes from TV, the internet, newspapers, magazines, books, or word of mouth, but not from personal experiences.

In both countries, long distance travel is clearly the prerogative of the better off (Table 6.2). People in upper-class occupations are significantly more likely to visit more distant regions of the planet. In Italy, this is also the case for white-collar employees, in contrast with manual workers. Cultural capital—operationalized as a tertiary-level qualification—is also a strong predictor of a wider range of respondents' space sets. Gender differences are modest but significant in the Italian case—overall, men have a slightly higher likelihood of traveling farther away. The range of space sets grows with age. This is quite logical, as the opportunities to travel increase with the passing of time (and possibly the accumulation of savings). It must be highlighted, however, the much higher probabilities of long-distance travel experiences of people aged 55 or older are found in France, and are not to be found in Italy. Perhaps this is the outcome of a relatively earlier massification of tourism in France, which may have incentivized foreign and exotic travel (France has also national territories in the Caribbean and Polynesia). An alternative hypothesis—that a wider range of space sets is a legacy of immigration and transnational ties—is not corroborated by the analysis ("immigrant status" in Table 6.2). While it is true that people with a more varied ethnic background (i.e., at least one parent born abroad, "foreign origins" in Table 6.2) appear to have slightly larger space sets, the difference is not significant in in either of the two countries.

DISCUSSION

In this chapter, we searched for answers to the question of how global international mobility actually is. Our findings can be summarized as follows:

1. The vast majority of all international mobility takes place between neighboring countries and within world regions. Only a small share spans across world regions.
2. How high exactly this intraregional share is, depends on the type of mobility, with refuge-seeking and tourism being a lot more regionalized than the international moves of students and scientists, for instance.
3. The spatial structures of most types of international mobility (refuge-seeking, tourism, migration, etc.) follow a power law, a pattern that also describes the movements of many other animal species on this planet well.
4. Over time, this spatial structure is very stable; international mobility has generally maintained its high degree of regionalization over the last decades.
5. The COVID-19 pandemic has had a mixed and overall limited impact: Compared to pre-pandemic times, the intra-regional share of international air traffic decreased during the first wave (April-June 2020), but then became disproportionally high afterwards, offsetting the earlier downtrend.
6. Sociodemographic characteristics affect how global international mobility is. The mobility range tends to be larger for individuals who are older, more educated, and in better-paying jobs. Gender and migration background, by contrast, appear to have limited stratifying effects.

These findings highlight that our international movements and social interactions are a lot less globalized than we often think they are. In contrast to what buzzwords like "global village" or "flat world" purport, international mobility is spatially restricted—and this spatial restriction is socially stratified. The implications of this limited reach are manifold. For one thing, our social

contacts also tend to be restricted to the regional scale, which means that we are unlikely to build social bonds with people outside our world region. As a consequence, the social world remains a parochial one—with a lack of global solidarity and sense of community as a likely outcome. It also implies that when conservatives and right-wing media or politicians draw a picture in which supposedly "the whole world" migrates to the rich countries of the Global North, this tends to be at odds with the empirical reality of international mobility. If it were true, the share of long-distance moves would be a lot higher than it actually is.

Another important issue is the inequality in opportunity that results from the social stratification of the spatial reach of international mobility. Not just because the upper classes are able to experience more and farther places, thereby potentially enriching themselves culturally, but also because they can reap the material and personal benefits of these moves: higher transnational capital and intercultural competence, larger and more diverse social networks that may allow to harvest the strength of weak ties (Granovetter 1973), a bigger pool of work and business opportunities, as well as more potential friendships and romantic partners.

The facts that international mobility has been very stable in its regionalized structure over time and that even a global pandemic had only a limited and temporary effect on it suggest that a truly globalized, fully mobile world in which everyone can (and does) just move everywhere, is highly unlikely to emerge. This is also because, as recent research shows, the main reason for the regionalized structure of international mobility is not the limited reach of cultural similarity, historical, political, legal, or economic ties, but geography (Deutschmann 2021). However, if the spatial structure of international mobility is predominantly structured by fixed physical space *itself* and to a much lesser extent by alterable social factors, then it is indeed prone to remain regionalized and structurally robust in the future.

Nonetheless, it will be interesting to see whether and how future crises, including most prominently the global climate crisis, will affect the spatial structure of international mobility. With ongoing digitalization—according to one estimate by Bill Gates, half of all business trips will disappear in the aftermath of the COVID-19 pandemic (Higgins-Dunn 2020)—and carbon-neutral long-distance flights still being decades away (Van Evra 2021), decreases in long-distance mobility are a real possibility. However, with countries beginning to ban short-distance flights (Macola 2021), it seems hard to predict whether this will lead to an even more regionalized world, or whether the present regionalized structure will simply persist in its current form, independently of the absolute amount of international mobility.

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