# Choosing where to have a coffee contributes to the segregation of the city

The Atlas of Inequality is an interactive map made from mobile geolocation data to determine where people of different incomes do (or not) encounter as they move around the city to work, shopping or during leisure time. The initiative, led by the Spanish researcher Esteban Moro, has already analysed the map of Boston and it will be extended to eleven other cities, including Madrid and New York.

Ana Hernando   11/6/2019 08:00 CEST
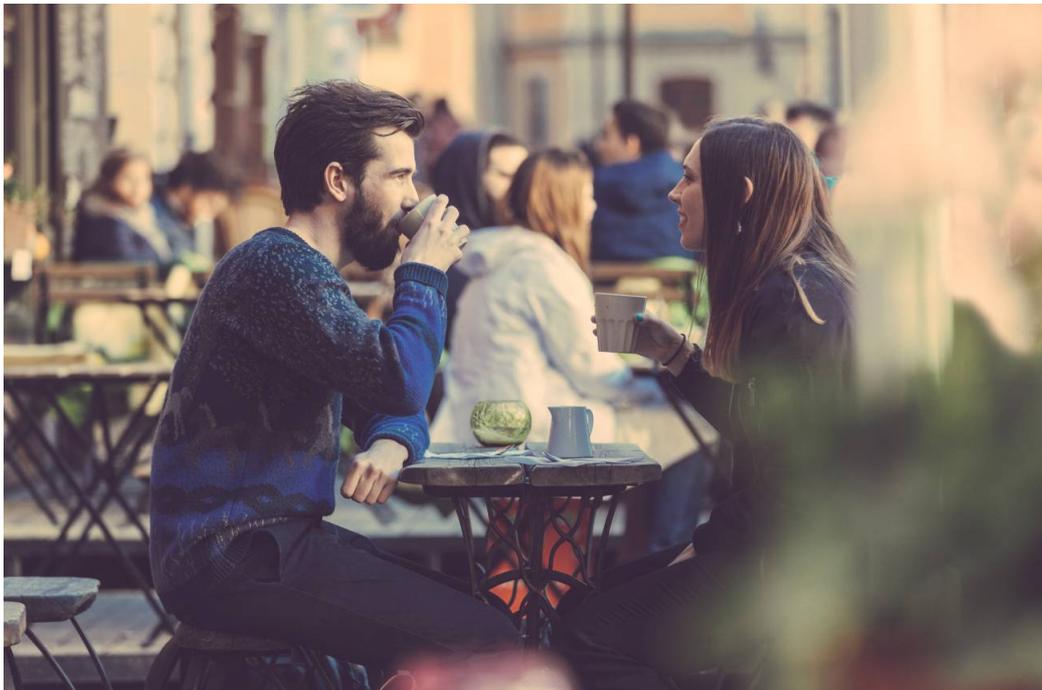
The Atlas of Inequality highlights that segregation extends to the places we visit every day in our city. / Adobe Stock

You are strolling through your city, you have some spare time and you decide to have a cup of coffee. On one side of the sidewalk you see a large cafeteria of a famous commercial chain, where customers of various nationalities, ages and purchasing power queue up. On the other side, an old bar with faithful customers, few resources, and the sign of "no credit given here." Which one will you enter? The organization of one's life in the cities depends on those choices.

The Spanish researcher Esteban Moro leads the Atlas of Inequality project, an interactive map that makes it possible to check the different levels of segregation in cities

So far, the tool used to find out in which areas the rich, the poor or the middle classes live has been the official **census, that is, where we live**. "But it's a limited system because we spend most of the day outside our neighbourhood," **Esteban Moro**, an MIT Media Lab researcher and professor in the department of Mathematics at the Universidad Carlos III de Madrid (UC3M), has told SINC.

Moro is currently leading a project called the **Atlas of Inequality**, which aims to go one step further and see how segregation extends to the places we visit every day in our city. The map is drawn from mobile geolocation data of people with different income levels.

The project, the researcher explains, "is part of a broader initiative to understand **human behaviour** in cities and how large-scale problems such as transport, housing, **segregation** or inequality depend, to some extent, on the patterns that emerge from our decisions or opportunities."

It is a line of research -he adds- "that we have been developing in the Human Dynamics group of the MIT Media Lab and of my department of the UC3M for a long time."

Esteban Moro, at the Carlos III University in Madrid / Álvaro Muñoz Guzmán / SINC

Although it is expected to extend to a dozen U.S. cities, the starting point of the atlas has been the [Boston metropolitan area](#), which, according to the latest census, has about 4.5 million inhabitants.

Coloured dots that warn about inequality

The starting point of the atlas has been the Boston metropolitan area, which has 4.5 million inhabitants and a great deal of segregation

The **interactive map** shows a multitude of coloured dots indicating levels of inequality, ranging from **red** for the most segregated spots to **blue** for the most diverse. According to Moro, "the map provides a snapshot of the **homogeneity** or **diversity** of income among the people who visit thousands of local destinations every day."

Income inequality and segregation "have traditionally been analysed in terms of the neighbourhoods in which people live. Here, the focus has been on identifying where people with different incomes meet, where they happen to be - or not to be - as they move around the city to **work**, **eat**, shop or go to **museums, cinemas, theatres and parks**," he insists.

According to the data handled by the authors, 75 % of the people we meet live very far from us. "If we are segregated, it is because we want to, not because of where we live," Moro points out. "In our atlas, what we observe is what people really do during the day. It allows us to see how different **income groups** come together."

Boston Inequality Atlas. Multitude of points of colors indicate the levels of inequality, that go from the red one for the most segregated places to the blue one for the opposite. / MIT MediaLab

To develop the Atlas of Inequality, researchers analysed the **mobility patterns** of about 150,000 anonymous users (about 3% of the Boston metropolitan area population) between October 2016 and March 2017.

The information was obtained through a cooperation with the Data for Good de Cuebiq initiative, which collects **geolocation data from mobile phones** and tablets using applications that need the appropriate location to offer their services, such as weather apps. This organization then provides this data anonymously and in an aggregated form for research purposes.

The team has used geolocation data in order to see where people of different incomes meet (or not) as they move around the city to work, shopping or during leisure time

The income range of the users was determined by the place of residence, which is deducted by the place where they spend their nights most frequently. In addition to the Foursquare app, researchers extracted the 35,000 local places visited by people, including outdoor public spaces, restaurants, shops, museums, residential areas and hospitals.

All this information, aggregated and anonymised, was then treated with **massive data analysis techniques, machine learning and algorithms** developed by the researchers in order to extract how many people from different economic groups go to the places analysed.

Segregation from one sidewalk to the other

In this first phase of the Atlas of Inequality "we have used massive data on how people move around the city. What we have also shown is that inequality or segregation happens not only between neighbourhoods, but **even at the street level**. Choosing one place or another to have a cup of coffee is also a way to foster segregation among ourselves," remarks Esteban Moro.

He comments that in the study they have found very diverse places next to others with strong segregation. He gives the example of two cafeterias that can be found on the interactive map and that are almost opposite each other. One of them (a local site) is only attended by people with few resources and the other (owned by a famous chain) has people with all kinds of income as customers. "That those places are so close to each other means that what we decide to do influences whether we find people from one group or another. It's our choice."

Image of two cafeterias on a Boston street that are 200 meters apart and have a very different levels of inequality. / MIT Media Lab

Another interesting discovery they have made is that Asian restaurants have less segregation than Latin American restaurants in Boston. "In Latin restaurants -except for Mexicans- there are usually people from a certain economic group. In a Japanese restaurant, however, you will find people of different purchasing power levels."

"We have shown that segregation occurs not only between neighbourhoods, but even within a few metres in the same street," says Moro

The researcher explains that for a visit to be counted, the user has to spend more than five minutes in one place. Clicking on a location reveals the relative proportion of each income group visiting that space, which is shown with a sign of one to four dollars, along with the classification of the income inequality of the place.

According to the free local newspaper [Next City](#), in Boston's the Atlas of Inequality certain patterns are immediately obvious. The dense downtown areas are full of blue dots, indicating that commerce and government areas are visited by people of all income levels.

In much of the eastern part of the city, a lot of red and orange dots show that most businesses still lean toward low-income groups, even though the influx of luxury residential towers is changing an area that has a lot of immigrants.

Airports, hospitals and museums, the most diverse

Among the places with the greatest diversity are **airports**, where you find people of all kinds, and **museums**, particularly science museums, which are among the least segregated in the U.S.," says Moro.

What the team has found is that, as in most major American cities, there is **"high segregation in Boston."** A [recent report](#) by The Brookings Institution indicates that it is the seventh most unequal city in the country in terms of income. [Another one](#) points out that the city has added tens of thousands of low- and high-income households over 25 years, while losing middle-income residents.

What are the **consequences** of the growing separation of different economic groups in cities? Esteban Moro points out that "the fact that we are not exposed to people of different socio-economic conditions causes us to segregate and this has consequences, especially in the area of **health**."
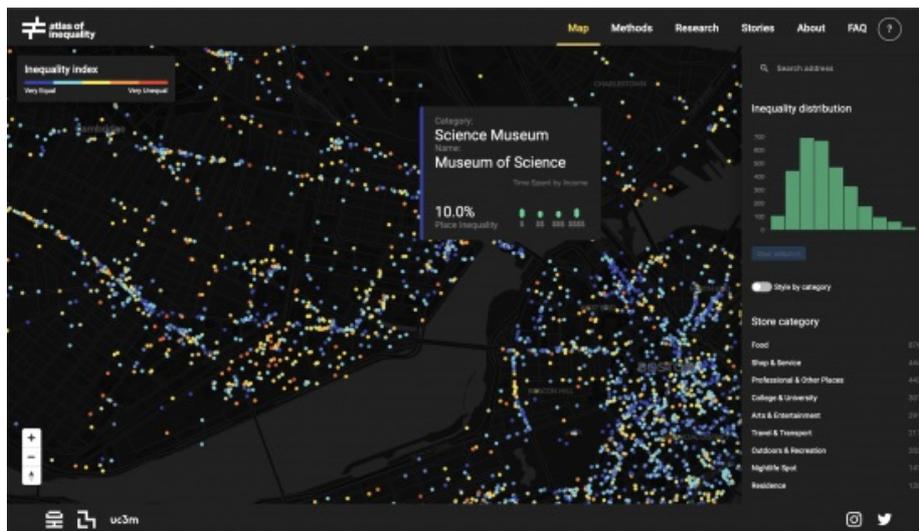
The Boston Science Museum is one of the least segregated places in the city. / MIT Media Lab

For example, he adds, "people who live in segregated and poor areas live less. There are also **economic consequences** and even consequences in **innovation**, because innovation is nourished by diversity. So the cities with the most inequality will be less innovative in the future," he says.

In addition, "it has effects on our **democracy**. A series of studies warns that the fact that we live segregated can impact on the implementation of redistribution policies of wealth, taxes, social spending, etc."

"People living in segregated and poor areas live less. There are economic consequences and even consequences in innovation, as this is nourished by diversity"

We are also responsible

Moro insists that we are also responsible for this inequality. "We decide where to go and we find ourselves more comfortable in places with people more like us. This has been studied. The Nobel Prize in Economics Thomas

C. Schelling investigated this phenomenon, which has a great effect on the segregation of cities, as we have seen in our project."

In the next phases of the atlas, the aim will be to create a **dynamic map** of places to see how city policies, changes in **public transport** or new **urban developments** can lead to more or less inequality in the places where encounters take place," he points out.

What the Atlas of Inequality provides is, "first of all, a resolution that didn't exist before," claims Moro. "The fact that we can investigate a particular block will make local **interventions** by the relevant agencies more effective. Secondly, the effect of these possible improvement actions to reduce segregation and **increase diversity** can be seen in real time. It's a very powerful tool, not only because it allows you to discover things, but because you can know how to improve."

This atlas is having an excellent reception "The good thing about making a platform like this is that people have immediately gone to check the places where they live and tell us stories of why they think a location is one way or another, and that information is very valuable to us."

It has also had a very good institutional response. "For example, from **town halls**, institutions and landowners that are interested in us doing a particular study or consult us because they want to know how an area has changed after having made an intervention."

Nueva York and Manhattan

The researchers have just uploaded the **New York** City Atlas of Inequality, whose data will now have to be analysed. At the outset, says Moro, "what is most striking is the number of blue dots that can be seen on the island of Manhattan, because the most diverse sites are concentrated in that area. Unlike the surrounding neighbourhoods, such as Queens, Brooklyn or New Jersey, where there are more red dots, that is, more segregation."

The team just uploaded the New York City Inequality Atlas to the platform. The large number of blue dots on the island of Manhattan reveals that it is the most diverse area of the city. / MIT Media Lab

After the New York atlas, the team will continue with **Seattle, San Francisco, Los Angeles, Miami, Washington, Philadelphia, Detroit** and **Chicago**. Outside the U.S., **Mexico City** is to be included. "We chose this city because its census is very good and because the company we work with [Cuebiq] has a very good penetration there."

"Just by changing 1% of our behaviour, we add 5% diversity to our lives and that's enriching"

Esteban Moro says that in **Spain** and **Europe**, until now, they had not considered doing anything similar, since the **Data Protection Act** "still does not clearly indicate what can and cannot be done. In the U.S. all this is more established," he explains. However, the researcher has just received the news that it will be possible to prepare the **Madrid Inequality Atlas.**

Let's cross the street

To conclude, the researcher has a piece of advice to give us on how to achieve greater diversity in our daily lives with small steps: "Just by changing 1% of our behaviour, we add 5% diversity to our lives and that is enriching."

Returning to the example of cafeterias opposite to each other, he encourages us to cross the sidewalk and make it possible to meet those we may not consider similar to us, but who can provide us with other points of view.

Updated on June, 12, 2019. After the publication of this report, the researcher learned that Madrid will also be one of the cities included in the Atlas of Inequality project.

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