Fun City Rankings

Introduction

Which cities in the world are the most fun?

A lot depends on this question.

When tourists decide where to travel, their top question is "will I have fun?". When planners invest in a city, their goal is to build a place where residents will enjoy their lives. Fun is at the center of a virtuous circle. Happy cities bring companies looking to hire productive workers.

Who is Ranking Cities?

Naturally the question is also of considerable interest to cultural journalists who run surveys and publish articles. Readers pay for this research by way of advertising, and tourism agencies pay for this research by way of sponsorship. It's big business, which is why service providers like Time Out are listed on the London AIM stock exchange.

Time Out describe themselves as a "global media and entertainment business that inspires and enables people to explore and enjoy the best of the city" [www.timeout.com/about/time-out-group].

The "Time Out Index" [www.timeout.com/things-to-do/time-out-index] is a survey designed to compare life in the greatest cities around the world. The Time Out Index 2019 surveyed 34,000 people about life in their city. They then ranked the 48 best cities in the world.

The top 5 ranked cities were:

1. New York
2. Melbourne
3. Chicago
4. London
5. Los Angeles

The bottom 5 ranked cities were:

44. Marseille
45. Bangkok
46. Kuala Lumpur
47. Beijing
48. Istanbul

Problem Statement: Replacing Surveys with Location Data

Surveying 34,000 people is an expensive project. The results are also prone to interpretation and strong cultural biases that cannot be completely scrubbed from the data.

Can location data be used instead to provide a cheaper and more objective "Fun City Rank"?

This project examines that question. The analysis pulls categorized venue location data from Foursquare [www.foursquare.com] to generate a "Fun City Ranking". The analysis is then compared to the original "Time Out Index 2019" to see if pure data analytics can be used as a substitute for more personal surveys.

What is Fun?

Fun activities are things people *want* to do – as opposed to activities that people *need* to do. Hence venues that offer cultural activities were included in "fun", while those which offered professional activities were excluded.

Included Venues	Excluded Venues
Museums	College Buildings
Art Galleries	Business Centers
Nature Preserves	Shopping Malls
Monuments	Hotels

Shopping venues and hotels were also generally excluded from this analysis. While shopping can be very fun, it is primarily an activity we *need* to do. Hotels, except for resorts, are usually not fun destinations in themselves, but are a means for tourists to access the fun they seek.

Fun was then divided into different ways a person could experience an activity. Seven (7) top-level descriptive verbs were used to classify fun:

Top Level Fun
Watch
Visit
Strive
Amuse
Indulge
Relax
Party

Some fun activities involve simply sitting and watching. Other fun activities involve visiting and exploring. While still others involved physically striving. Examples are provided below:

Watch	Visit	Strive
Circus	Exhibitions	Fitness Center
Movie Theatre	Memorial Sites	Bike Trail
Concert Hall	Botanical Garden	Fishing Spot
Stadium	Scenic Lookout	Golf Course

Activities that didn't quite fit into Watch, Visit, or Strive were allocated to "Amuse":

Amuse
Casino
Pool Hall
Racecourse
Theme Park

Food and drink were the most difficult to include in the definition of "fun". On the one hand, eating is clearly something that we *need* to do – not just something we *want* to do – and hence not fun. On the other hand, going to a restaurant is an important part of a fun social life.

But it is difficult to rank restaurants globally as a special activity designed to bring enhanced levels of joy. For example, going to a Szechuan Restaurant might be very special in Paris but very ordinary in Beijing.

As a result, only eating venues that were established for the sole purpose of fun and allowed patrons to "Indulge" were included in the analysis. Beverage venues were then generally split between "Relax" and "Party" (along with a few other venues).

Indulge	Relax	Party
Desert Shop	Coffee Shop	Bar
Creperie	Massage Studio	Nightclub
Candy Store	Sauna	Music Venue
Vineyard	Resort	Dance Club

Data Source

The Foursquare API was used to collect the location data for the analysis. Two Foursquare API's were used:

1. Search for Venues
2. Get a Venue's Photos

Search for Venues
Search is a Regular API Endpoint that can be called up to 99,500 times per day. Both user and userless authentication is accepted. The GET request looks like:

GET https://api.foursquare.com/v2/venues/search

The 'near' field can be passed to specify a starting location. In this case, the downtown location of each of the 48 cities from the Time Out Index 2019 were used.

A 'categoryId' can be passed to the call to focus on those venues classified within a "Top Level Fun" category.

The 'radius' field is set so that fun venues within 2 km of each downtown city are returned.

The search API was called for 48 cities x 123 categories = 5,904 times.

Each call returns up to 50 venue results. A total of 71,283 venues were collected.

Get a Venue's Photos

Photos is a Premium API Endpoint so it can only be called up to 500 times per hour. Both user and userless authentication is accepted. The GET request looks like:

GET https://api.foursquare.com/v2/venues/VENUE_ID/photos

The 'VENUE_ID' collected from the Search API is passed to the call. But only those venues that are likely to return good photos were used. Hence venues that fall within the following categories were selected:

- Historic Site
- Monument / Landmark
- Intersection (an extra category searched for the purpose of photo collection)

Analytic Challenges: Targeting Tourists

This analysis focused primarily on tourists coming to enjoy a city. It was assumed that tourists would arrive in the downtown heart of the city and be interested in just those activities within a short 2 km journey.

While a broader "Fun City Rank" analysis would also involve the long-term residents of a city, focusing just on tourists eliminates a lot of practical problems. For instance, a full analysis would involve the data collection of all venues across the entire city – not just those within a 2 km circle of downtown. This would, in turn, require an analysis of the size of the city as well as population density so that some sort of "fun per capita" metric could be generated.

But tourists are less concerned with a city's size, population, and density. Their primary concern is whether fun venues are easily accessible nearby.

Methodology: Calculating a "Fun City Rank"

The Fun City Rank of each city is calculated by comparing both the *number* and *variety* of fun venues accessible to tourists.

Those cities that scores well in each "Top Level Fun" category – the cities that offer the most ways to *Watch* and *Visit* and *Strive* and *Amuse* and *Indulge* and *Relax* and *Party* – will be ranked among the world's most fun cities.

Cities that do not offer a wide variety of fun are therefore punished. For example, a city that has dozens of casinos but nothing else will score low overall.

Detailed Methodology

This project will:

1. Use the Foursquare Venue Search API to collect city venue data [Regular Endpoint]
   a. Data is collected for the same Top-48 cities identified in the Time Out Index
   b. The search covers venues fitting the 7 "Top Level Fun" categories
      (these cover 123 Foursquare Categories and Sub-Categories)
   c. The search radius covers 2 km around each downtown city center
   d. The maximum of 50 venues per query is collected for each [City x Category]

2. Calculate a "Fun Rank" for each city
   a. Parse the Foursquare data to calculate the number of accessible fun venues
   b. Group the individual categories by "Top Level Fun" categories
   c. Sort each city by each Top-Level Fun category and allocate points
      (this normalizes the results so that a city with 2 large stadiums won't lose out to a city with 3 small salsa clubs)
   d. Allocate 'stars' to each city
      The best city in each Top-Level Fun category receives 5 stars
      The worst city will receive 0 stars.
   e. Sum the total points given to each city
   f. Sort and rank all the cities

3. Compare the "Fun Rank" with the "Time Out Index 2019"
   a. Create a correlation Scatter Plot comparing the two results
   b. Run a regression to fit the Fun Rank against the Time Out Index
   c. Discuss sources of discrepancies

4. Map Fun Venues in each City
   a. Randomly select 10% of venues for plotting on each city map
   b. Use the Folium library to map the selection of venues for select cities
   c. Color code the venues by Top-Level Fun category

5. Use the Foursquare Venue Photos API [Premium Endpoint]
   a. Collect city photos taken from nearby intersections and historic sites

6. Prepare a blog posting discussing the project findings
   a. Include rankings, charts, maps, and photos

Results

Below is the Time Out Index 2019 list of the 48 best cities in the world compared against the calculated Fun City rank.

Rank	Time Out Index 2019	Fun City Rank
1	New York	New York
2	Melbourne	Istanbul
3	Chicago	Singapore
4	London	Tokyo
5	Los Angeles	London
6	Montreal	Sydney
7	Berlin	Madrid
8	Glasgow	Kuala Lumpur
9	Paris	Vienna
10	Tokyo	Melbourne
11	Madrid	Moscow
12	Cape Town	Boston
13	Las Vegas	São Paulo
14	Mexico City	Seattle
15	Manchester	Berlin
16	Philadelphia	Mexico City
17	Barcelona	Shanghai
18	Buenos Aires	Philadelphia
19	Lisbon	Barcelona
20	Washington	San Francisco
21	Tel Aviv	Munich
22	Mumbai	Hong Kong
23	Toronto	Paris
24	Birmingham	Bangkok
25	Dublin	Tel Aviv
26	São Paulo	Washington
27	Miami	Buenos Aires
28	Porto	Los Angeles
29	Singapore	Montreal
30	Edinburgh	Lisbon
31	San Francisco	Dublin
32	Dubai	Rio de Janeiro
33	Munich	Marseille
34	Vienna	Glasgow
35	Shanghai	Porto
36	Moscow	Birmingham
37	Delhi	Cape Town
38	Seattle	Chicago
39	Sydney	Edinburgh
40	Abu Dhabi	Manchester
41	Hong Kong	Abu Dhabi
42	Boston	Miami
43	Rio de Janeiro	Beijing
44	Marseille	Toronto
45	Bangkok	Las Vegas
46	Kuala Lumpur	Mumbai
47	Beijing	Delhi
48	Istanbul	Dubai

Discussion

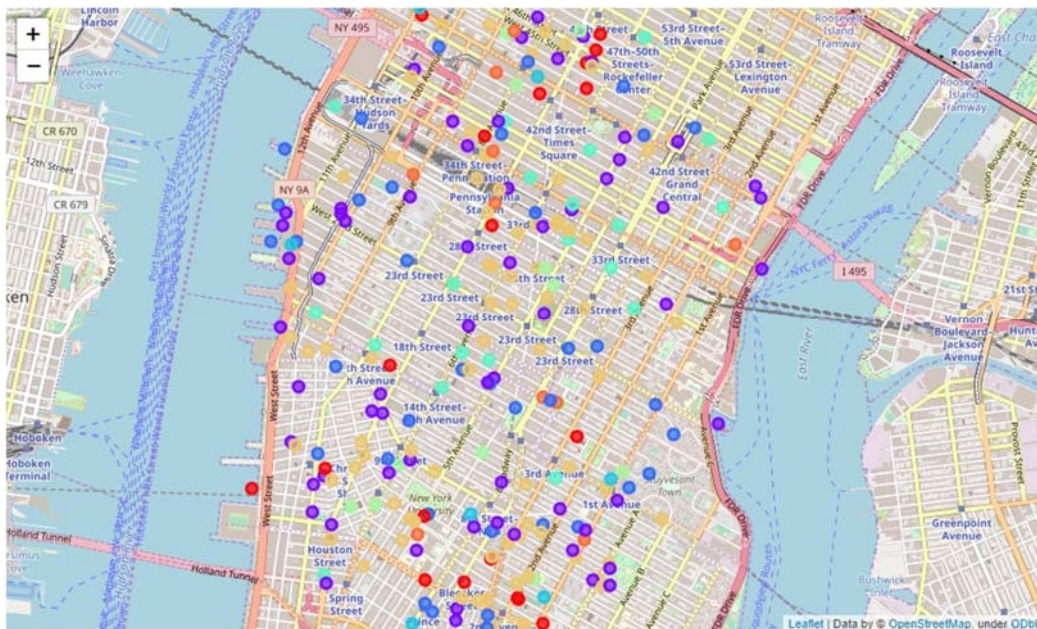Four cities have been selected for individual analysis:

1. New York
2. Istanbul
3. Chicago
4. Paris

New York [Time Out Rank = 1 / Fun City Rank = 1]

[New York – photo courtesy of Foursquare]

New York received the top ranking in both the Time Out Index 2019 survey and the Fun City location analysis.

New York - City Star Scores

Watch	Visit	Strive	Amuse

Indulge	Relax	Party

The city scored high across the board in each of the Top-Level Fun Categories, with fun venues spread out across the city (note that only 10% of venues have been randomly selected and plotted on the maps).
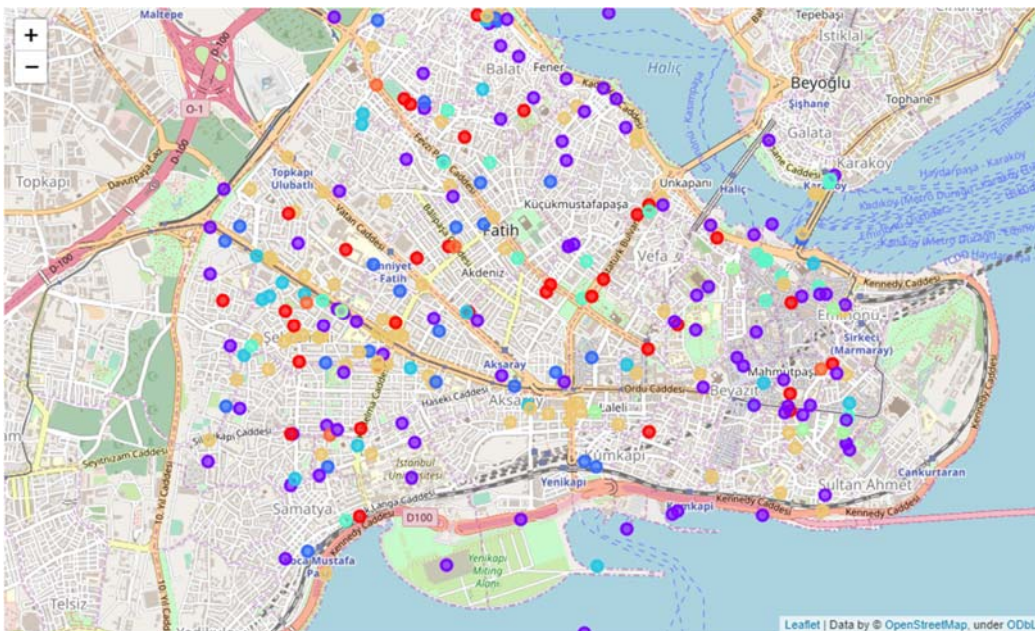
New York has 700 venues to visit (including Art Galleries, Museums, and Historic Sites) and over 900 venues at which to party (including Bars and Music Venues). With 3.5 stars, there are relatively few venues where visitors can indulge, although the city does boast 20 wineries!

Istanbul [Time Out Rank = 48 / Fun City Rank = 2]

[Istanbul – photo courtesy of Foursquare]

Istanbul was the surprise city of the study. The city was ranked last in both the Time Out Index 2018 and 2019. But according to location data analysis, the city deserves a global ranking as the 2nd most fun city in the world!

Istanbul - City Star Scores

	0.0	1.0	2.0	3.0	4.0	5.0
Watch	★	★	★	★	★	
Visit	★	★	★	★	★	
Strive	★	★	★	★	★	
Amuse	★	★	★	★	★	
Indulge	★	★	★	★		
Relax	★	★	★			
Party	★	★	★	★		

Watch **Visit** **Strive** **Amuse**

Indulge **Relax** **Party**

Downtown Istanbul offers more than 2,500 fun venues. Like New York, Istanbul offers plenty of venues to visit and strive (including a plethora of historic sites, as well as 350 basketball courts, soccer fields, beaches, and recreational centers).

In addition, Istanbul offers even more locations than New York to watch and amuse. These include 240 comedy clubs, concert halls, performing arts venue, and movie theatres where a tourist can watch shows. And 220 arcades, casinos, pool halls, racetracks, and theme parks where tourists can amuse themselves.

Istanbul is weakest (scoring only 3 stars) when it comes to providing tourists a location to relax. Although Istanbul has 130 cafés, coffee shops, and resorts, the city shuns massage studios and offers almost none.

It is baffling why Istanbul scores so badly in the Time Out Index 2019. According to the Time Out Index website [https://www.timeout.com/things-to-do/best-cities-in-the-world], Istanbul has a lot to offer tourists. It has:

- become a considerably more affordable destination with a weaker currency,
- 86 percent of people having a night out with friends in the last week, and
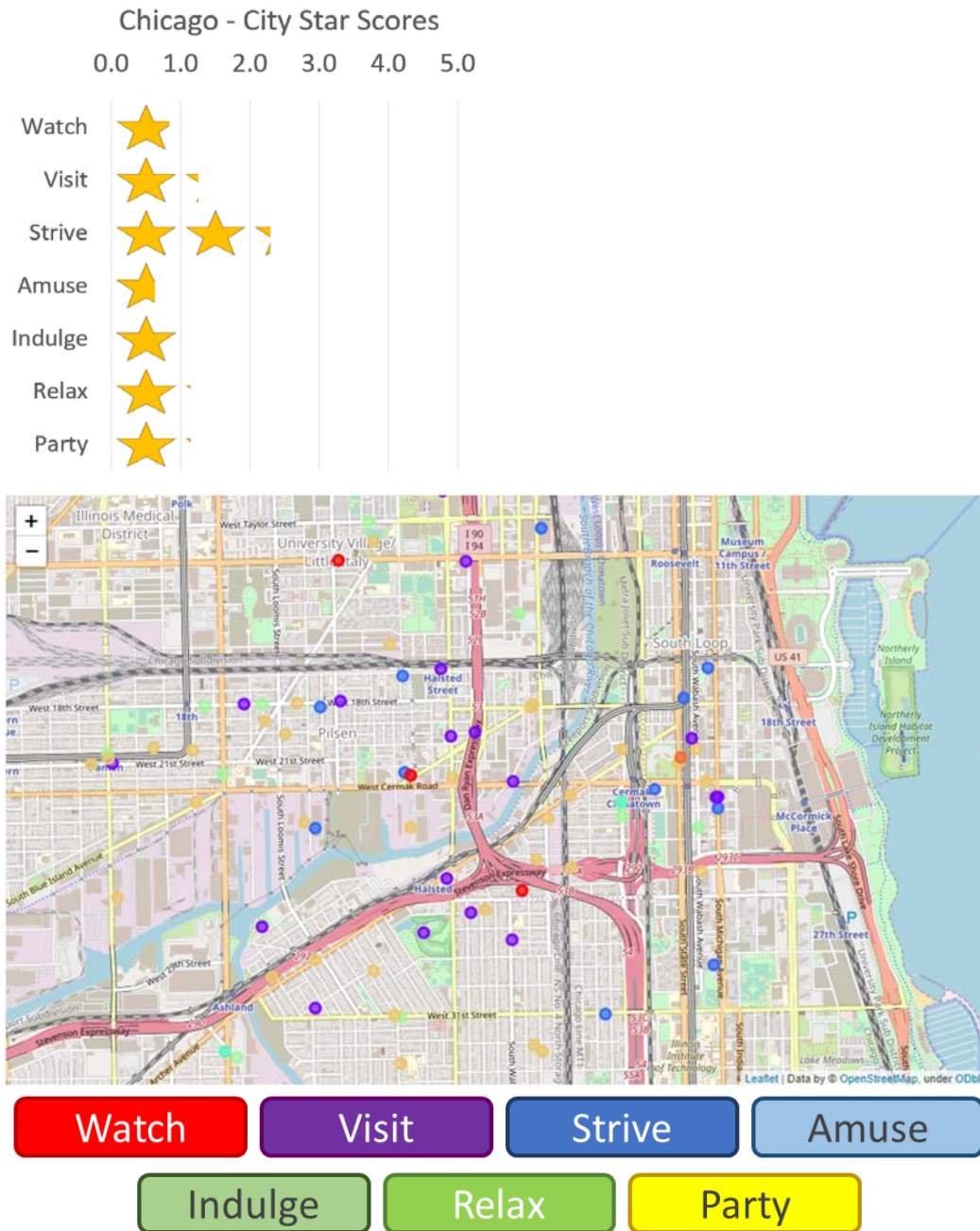- 97 percent of people drinking coffee (more than anywhere else)

Location data analysis proves Istanbul to be a very diverse and fun city!

Chicago [Time Out Rank = 3 / Fun City Rank = 38]

[Chicago – photo courtesy of Foursquare]

Chicago is another city that needs a closer look. While the city ranked 3rd in the Time Out Index 2019, an analysis of Chicago's fun venues causes its Fun City Rank to drop down to 38th worldwide.

Chicago - City Star Scores

	0.0	1.0	2.0	3.0	4.0	5.0
Watch						
Visit						
Strive						
Amuse						
Indulge						
Relax						
Party						

Watch   **Visit**   **Strive**   **Amuse**

Indulge   **Relax**   **Party**

As with all cities, a random sample of 10% of the fun venues has been selected for inclusion on the city map. Even so, it is clear from the map that the city is lacking in fun venues. The city scores only 1-star in 6 of the 7 Top-Level Fun categories – putting it in the bottom 20% of each category.

The city's best fun category is "strive", where it scores 2.3 stars. Here the city offers 150 venues for recreational athletes, including 50 gymnasiums, 27 playgrounds, and 21 swimming pools.

The Time Out website [https://www.timeout.com/things-to-do/best-cities-in-the-world] says that:

- Chicago is second to none when it comes to food and drink, and
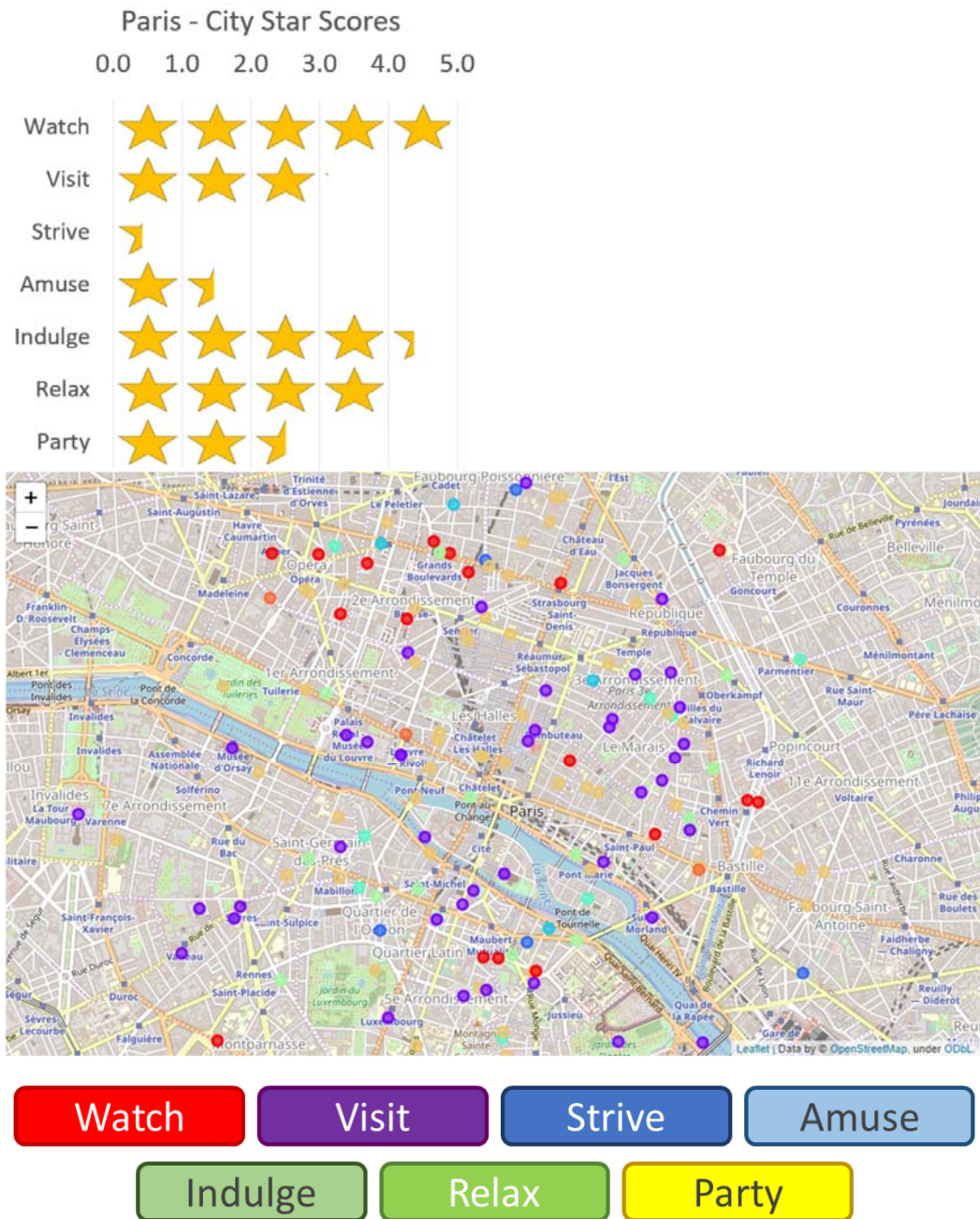- 52% of people can't get through the week without exercise

Unlike the Time Out Index 2019, the Fun City Ranking excludes restaurants from the analysis. This is largely on the basis that eating is something we *need* to do as opposed to something fun we *want* to do. This exclusion partly explains the discrepancy with the Time Out Index. But it remains obvious that Chicago is a city in which you must create your own fun – the fun won't come to you.

Paris [Time Out Rank = 9 / Fun City Rank = 23]

[Paris – photo courtesy of Foursquare]

Paris offers an interesting study in contrasts. For most cities, the number of stars received is roughly the same across each Top-Level Fun category. Hence cities that score well in one category tend to also score well in all the others. But Paris is a little different.

Paris - City Star Scores

	0.0	1.0	2.0	3.0	4.0	5.0
Watch	⭐	⭐	⭐	⭐	⭐	
Visit	⭐	⭐	⭐			
Strive	◗					
Amuse	⭐	◗				
Indulge	⭐	⭐	⭐	⭐	◗	
Relax	⭐	⭐	⭐			
Party	⭐	⭐	◗			

Watch	Visit	Strive	Amuse

Indulge	Relax	Party

Paris ranks 2nd in the world in the "Watch" category. It offers 50 comedy clubs, 47 concert halls, 49 movie theatres, and 50 performing arts venues (well over 200 venues in total).
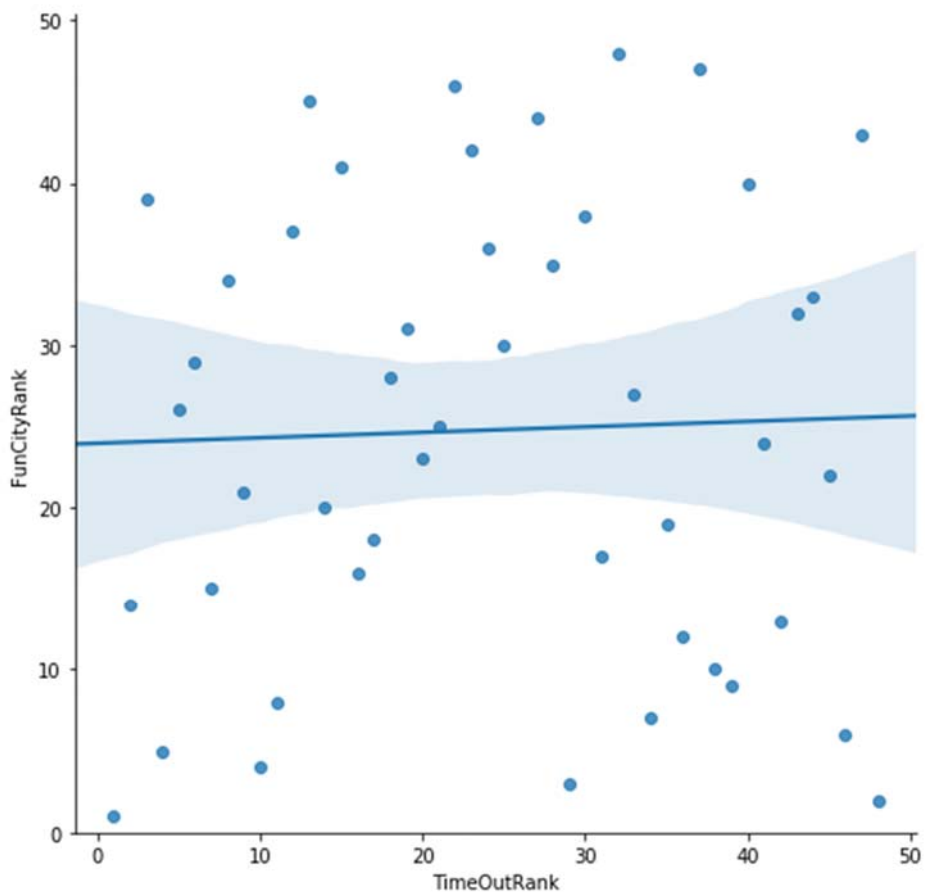
But Paris ranks almost last in the "Strive" category – offering tourists and residents very few physical and outdoor recreational activities. There are, for example, only 4 soccer fields within 2 km of the downtown area (New York City offers 20 soccer fields).

While striving is not something Parisians do, there are over 300 venues where one can relax and indulge. These include 100 creperies and dessert shops, 50 chocolate shops, and nearly 100 cafés and coffee shops. Paris clearly has a very distinctive definition of "fun"!

Comparing Survey Results vs Analytics

Can the location-based Fun City Rank can replace the slower, more expensive, and more subjective surveys used by the Time Out Index 2019?

To answer this question, a regression was run between the city rankings from the Fun City Rank and the Time Out Index 2019. The resulting plot is shown below:

The calculated correlation between both city rankings is only 0.034 with such a small level of confidence that there does not appear to be any correlation at all. The Fun City Rank can not replace the Time Out Index 2019.

Conclusion

Both survey results *and* location-based analytics are required to accurately determine the "Greatest Cities in the World".

The Time Out Index 2019 survey attempts to measure the following dimensions [https://www.timeout.com/things-to-do/time-out-index]:

- **Food**: Is the city's eating scene outstanding when it comes to quality, variety and affordability?
- **Drink**: Is there always somewhere great to grab a drink, no matter how late it is?
- **Culture**: Does the city produce, nurture and host world-beating cultural talent?
- **Music**: Is there a packed calendar of awesome live concerts year-round?
- **Nightlife**: Does the city have an after-dark scene that'll change your life?
- **Sociability**: Is it easy to make friends, and do people regularly meet up and socialize?
- **Happiness**: How happy are the city's residents, day-to-day?
- **Progress**: Has the city got better over time?
- **Attractiveness**: Is the city a place that people around the world are desperate to visit?
- **Other qualities**: Is the city affordable, convenient, diverse, dynamic, creative, safe, clean, friendly and beautiful?

These dimensions are much broader than those included in the Fun City Rank, and could not be included in a pure location-based calculation without a lot more analysis. Food, for example, is a major source of enjoyment in a city but was all but excluded from the Fun City Rank.

But this does not mean that the location-based analysis is wrong.

Strong unconscious bias in the surveys may be unfairly tipping the results. Of the top-20 cities in the Time Out Index 2019, only Tokyo was not built upon a European model.

Many of the cities ranked at the bottom of the Time Out Index 2019, like Istanbul, may deserve to be much closer to the top. And after a cold-hard look at the location data, cities like Chicago should be pushed down the list.

Balancing the objective with the subjective is the best way to generate accurate results.