# Making the invisible visible

Making abstract concepts perceptible through data visualization.

Emotions, ideas, hope, and happiness are examples of abstract concepts that have no physical or spatial constraints because they have no direct representation in the physical world. They are hard to explain and usually generate a great amount of debate and so much literature, but can we turn these abstract concepts into something perceptible to the eye, and more importantly, useful in acquiring knowledge? How can transposing these concepts into insightful data visualizations help the community at large?

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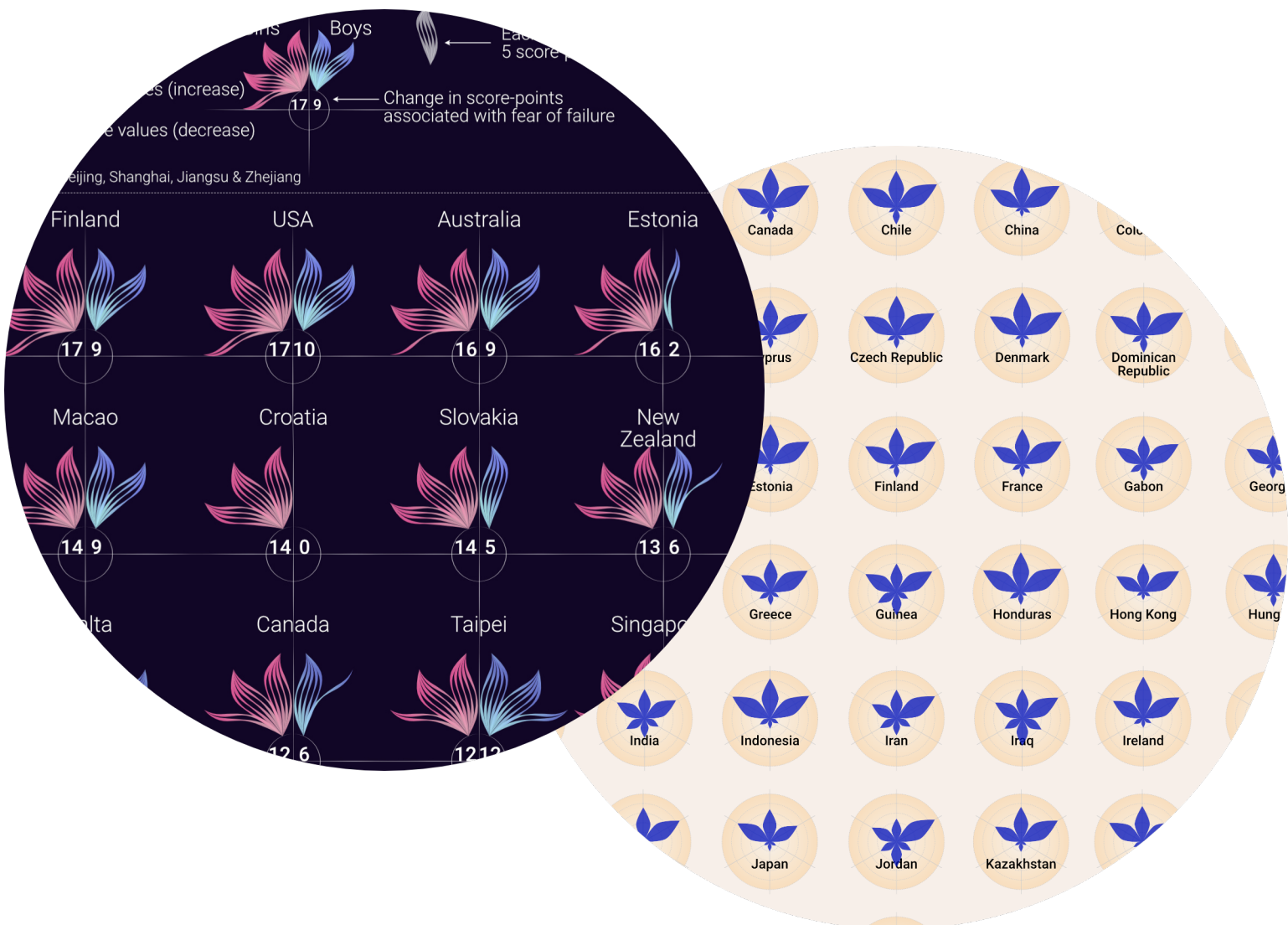
About me

Information designer

I am an Information designer and entrepreneur based in Bucharest. I worked as a journalist and as a communication consultant. My passion for information design drove me to build my own company (Egas Studio). I am actively developing static and interactive data visualization projects for business clients, NGOs, and media outlets. Some of my biggest media projects are published in Panorama.ro, where I am the author of the Infographics section.

This year, my portfolio was shortlisted at the Sigma Data Journalism Awards. Also, my work has been shortlisted for this year's Information is Beautiful Awards.

🌐 **https://editgyenge.com/**

📷 @editgyenge

🐦 @edit_gyenge

Bē @eg44

Company website:

🌐 **https://egas.studio/**

Main data journalism projects:

🌐 **https://panorama.ro/infografice/**

Introduction

The concern for visualizing abstract concepts

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We are used to data visualization as a mean of enhancing our understanding of the world, building knowledge, clarifying trends. We use data visualization to better understand key economic facts, sports results, political distribution, health data, geographic information and so much more, usually numbers and figures that define industries and domains. But data visualization isn't just a tool of "the perceptible".

It is only in recent years that data visualization started to be used as a mean of understanding more abstract concepts like feelings and emotions. It is an important mean to figuring out and visualizing concepts that aren't really tangible, are more difficult to quantify and that aren't perceptible, at least not with our main senses.

In the past few years, the COVID-19 pandemic really affected everyone's mental balance. Recent studies show that depression and anxiety reached historical levels. So, the more important it becomes to be able not just to measure feelings, but to visualize them in order to understand key social trends.

3 reasons why data visualization of feelings and emotions is useful:

- Understanding the big picture
- Connecting the dots and making associations
- Building a broader sense of reality

Understanding the big picture

Seeing the emotional bubbles

If I were to ask you a simple question like who do you think smiles the most? Or which country has the angriest people? What is the main thing that comes into you mind? Can you visualize the answer?

Bellow is a data visualization project that shows how the world feels right now by describing the prevalence of six major feelings: **smile, enjoyment, respect** on one hand and **sadness, pain and anger** on the other hand.

The data is from the **Gallup - Global Emotions Report 2022**. Gallup conducted a global research to discover the emotional state of people in more than 100 countries and areas in 2021.
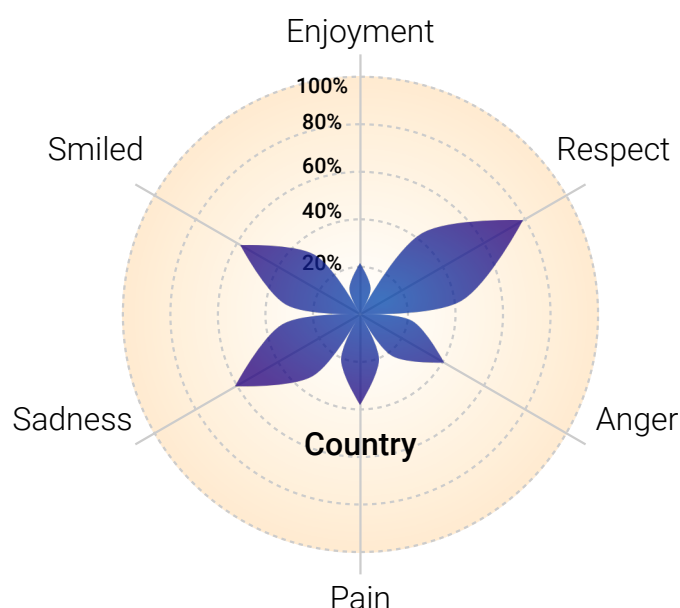
People were asked, if they were to think of yesterday, did they experience feelings of **smile, enjoyment, respect, sadness, pain and anger?**

Tools used to build it:

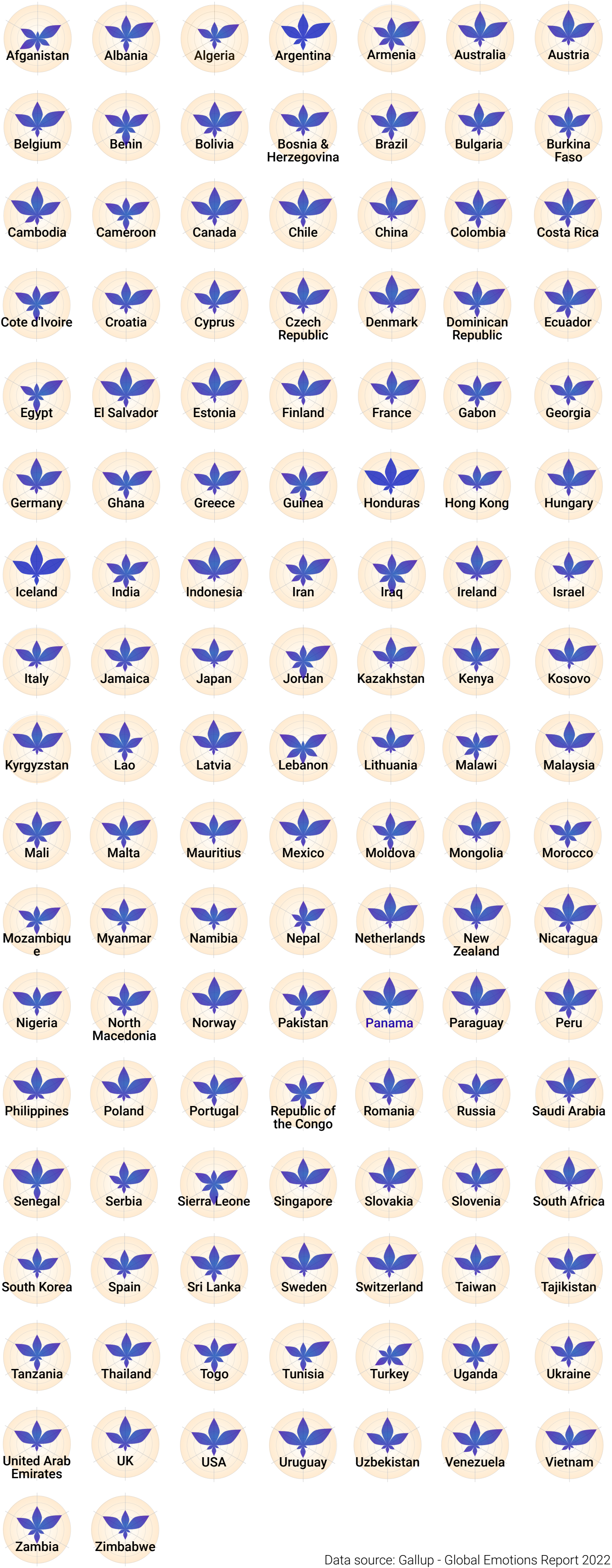The stellar chart was build with **Flourish.studio**

The design improvement and processing was made using **Affinity Designer**

How to read the chart:

Enjoyment
100%
80%
60%
40%
20%
Smiled
Respect
Sadness
Anger
Country
Pain

Emotional bubbles around the world

Afghanistan, Albania, Algeria, Argentina, Armenia, Australia, Austria

Belgium, Benin, Bolivia, Bosnia & Herzegovina, Brazil, Bulgaria, Burkina Faso

Cambodia, Cameroon, Canada, Chile, China, Colombia, Costa Rica

Cote d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador

Egypt, El Salvador, Estonia, Finland, France, Gabon, Georgia

Germany, Ghana, Greece, Guinea, Honduras, Hong Kong, Hungary

Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel

Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kosovo

Kyrgyzstan, Lao, Latvia, Lebanon, Lithuania, Malawi, Malaysia

Mali, Malta, Mauritius, Mexico, Moldova, Mongolia, Morocco

Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua

Nigeria, North Macedonia, Norway, Pakistan, Panama, Paraguay, Peru

Philippines, Poland, Portugal, Republic of the Congo, Romania, Russia, Saudi Arabia

Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa

South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan

Tanzania, Thailand, Togo, Tunisia, Turkey, Uganda, Ukraine

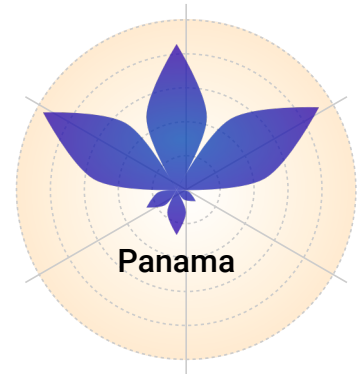United Arab Emirates, UK, USA, Uruguay, Uzbekistan, Venezuela, Vietnam
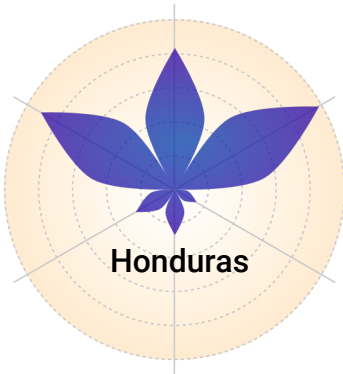
Zambia, Zimbabwe

Understanding the big picture
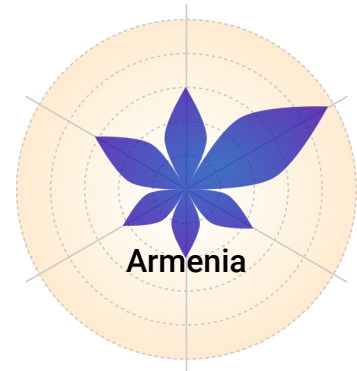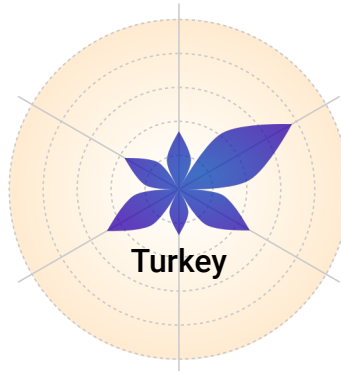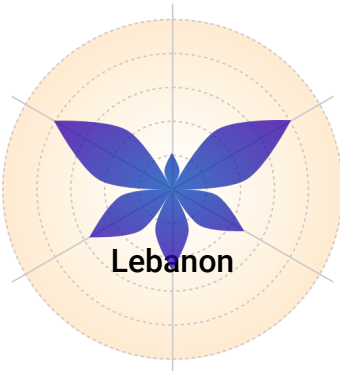
Seeing the emotional bubbles

Visualizing the emotional temperature of the world allows us to see not only the current status of each state, but to also compare states from the same region and different regions, to see the outliers and major differences.

How to read:

Enjoyment
Smiled
Respect
Sadness
Anger
Country
Pain
100%
80%
60%
40%
20%

Who smiles the most?

Honduras

Indonesia

Panama

Who is the agriest?
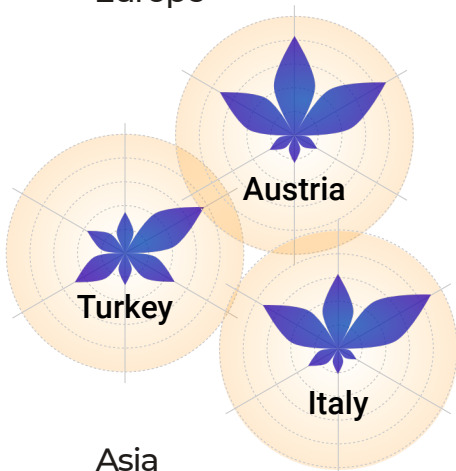

Lebanon

Turkey

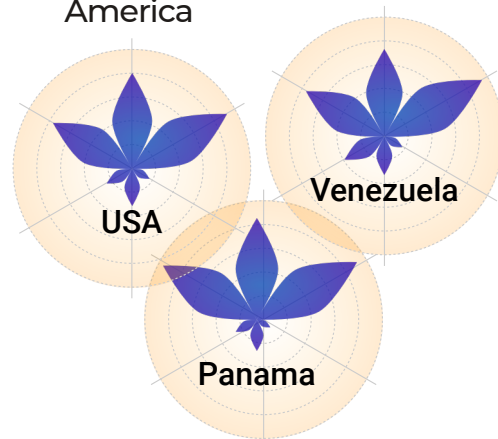Armenia

How does this generate an impact?

Understanding social dynamics

Visualizing the state of mind, feelings and opinions can generate a major breakthrough in understanding social trends, community evolution and mass mobilization. After all, feelings and personal opinions have long been a source of inspiration not only for politics, but also for modern capitalist societies, where advertising is one of the leading industries. Societies are driven by many things, but people are driven by feelings. Understanding them and using them to improve social well-being can have a huge impact on the world itself.
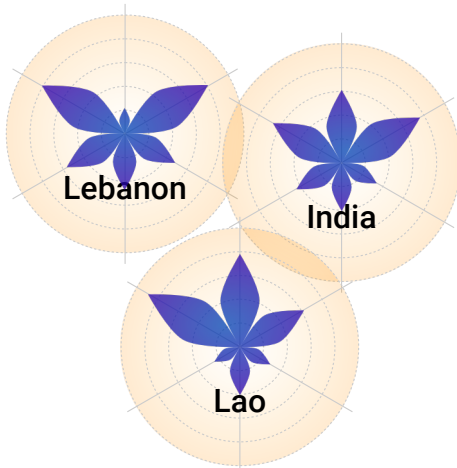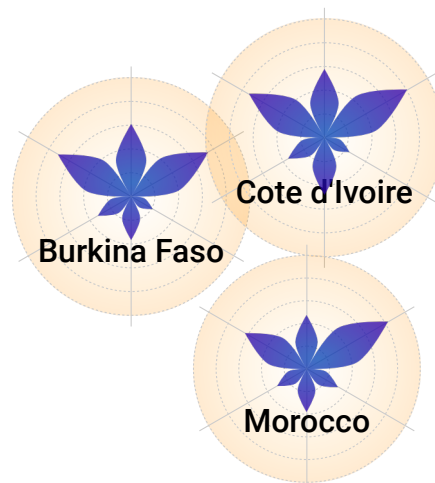
Europe

Austria

Turkey
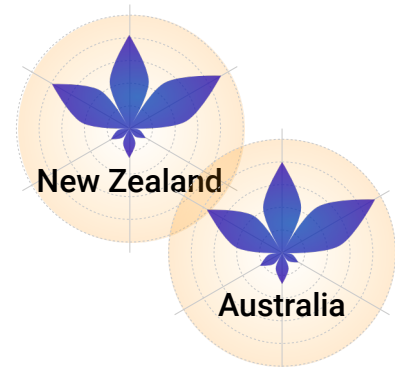
Italy

America

USA

Venezuela

Panama

Asia

Lebanon

India

Lao

Africa

Cote d'Ivoire

Burkina Faso

Morocco

Australia & Oceania

New Zealand

Australia

Connecting the dots

How feelings influence facts

What if we combine data sets to see if there are certain connections? Data analysts do it all the time, it's the most interesting way of finding out if what lies beneath is more deeper than we have imagined.

When dealing with emotions, the connection is made through tests and trials, studies and a complex analytical process. The question here is how certain feelings influence facts and, moreover, how can visualizing these feelings and facts enhance our understanding of reality.

One of the pillars on which modern society is built is the success vs. failure paradigm. Modern non-fiction books often tackle this topic that essentially is a personal perceptions of a more personal development. Now, success and failure are perceived differently by every individual and the key focus is understanding how these perceptions affect other things like performance and achievements.

In 2018, the OECD analyzed the impact of fear of failure on the reading performance of 15 year old boys and girls at the PISA tests.
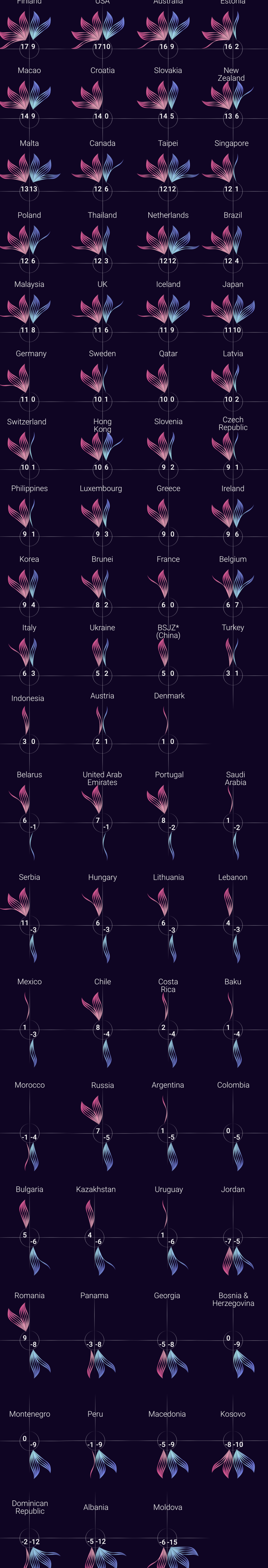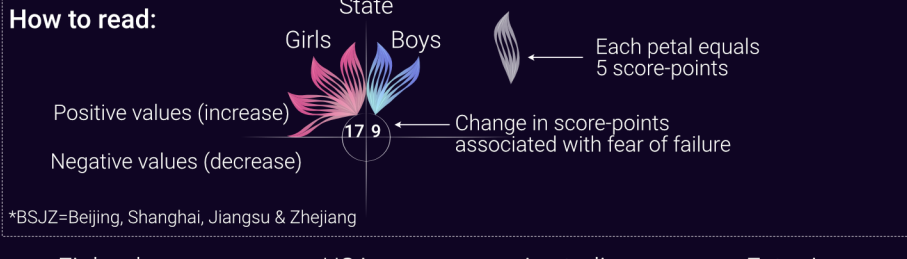
Specialists have shown that fear of failure is a strong determinant of school performance. A "healthy" dose of fear of failure can make a huge difference in a child's results or vice versa, depending on the country.

I visually represented the data using Tableau Public and Affinity Designer.

Association between fear of failure and reading performance, by gender

Change in reading performance associated with a one-unit increase in the index of fear of failure

How to read:
State
Girls Boys
Each petal equals 5 score-points
Positive values (increase)
17 9
Change in score-points associated with fear of failure
Negative values (decrease)

*BSJZ=Beijing, Shanghai, Jiangsu & Zhejiang

Finland 17 9	USA 17 10	Australia 16 9	Estonia 16 2
Macao 14 9	Croatia 14 0	Slovakia 14 5	New Zealand 13 6
Malta 13 13	Canada 12 6	Taipei 12 12	Singapore 12 1
Poland 12 6	Thailand 12 3	Netherlands 12 12	Brazil 12 4
Malaysia 11 8	UK 11 6	Iceland 11 9	Japan 11 10
Germany 11 0	Sweden 10 1	Qatar 10 0	Latvia 10 2
Switzerland 10 1	Hong Kong 10 6	Slovenia 9 2	Czech Republic 9 1
Philippines 9 1	Luxembourg 9 3	Greece 9 0	Ireland 9 6
Korea 9 4	Brunei 8 2	France 6 0	Belgium 6 7
Italy 6 3	Ukraine 5 2	BSJZ* (China) 5 0	Turkey 3 1
Indonesia 3 0	Austria 2 1	Denmark 1 0	
Belarus 6 -1	United Arab Emirates 7 -1	Portugal 8 -2	Saudi Arabia 1 -2
Serbia 11 -3	Hungary 6 -3	Lithuania 6 -3	Lebanon 4 -3
Mexico 1 -3	Chile 8 -4	Costa Rica 2 -4	Baku 1 -4
Morocco -1 -4	Russia 7 -5	Argentina 1 -5	Colombia 0 -5
Bulgaria 5 -6	Kazakhstan 4 -6	Uruguay 1 -6	Jordan -7 -5
Romania 9 -8	Panama -3 -8	Georgia -5 -8	Bosnia & Herzegovina 0 -9
Montenegro 0 -9	Peru -1 -9	Macedonia -5 -9	Kosovo -8 -10
Dominican Republic -2 -12	Albania -5 -12	Moldova -6 -15	

Data: OECD, 2018

Connecting the dots

How feelings influence facts

Girls react better to the fear of failure as the chart shows us. When the fear of failure index was increased, girls significantly improved their reading performance. Fear of failure seems to somehow motivate girls more than boys. The results are very strong in developed economies, where there is also a stronger gender gap. Girls in the United States and Finland improved their reading scores by 17 points, while the OECD average is 9 points higher.

But the fear of failure does not motivate everyone. Several countries in Latin America and the Balkans react negatively to the fear of failure by lowering overall reading performance, which speaks a lot of the capability of a child of facing stressful life situations.

In nearly half of the states, boys do not respond well to fear of failure. In 31 countries out of 75, boys scored lower in reading when they were confronted with the fear of failure.

How does this generate an impact?

Finding potential explanations and developing strategies

In her book, **The gift of failure, Jessica Lahey** talks about the fact that girls are usually more protected from mistakes by their parents and end up with a strong fear of failure, which is why they avoid risks and focus on appearances and image. This, Lahey argues, leads to increased vulnerability to depression, anxiety and stress.

Worldwide, the number of women with depression and anxiety disorders is much higher than that of men, and in recent years, the number prescribed of anti-anxiety pills has increased in Europe.

What the chart showed us is the potential of explaining a trend from early stages of adolescence. This ca help in educational strategy development, improving educational systems and also, a proper strategy development that can improve overall performance at the work place.

USA

Hungary

Moldova

17 10

6

-3

-6 -15
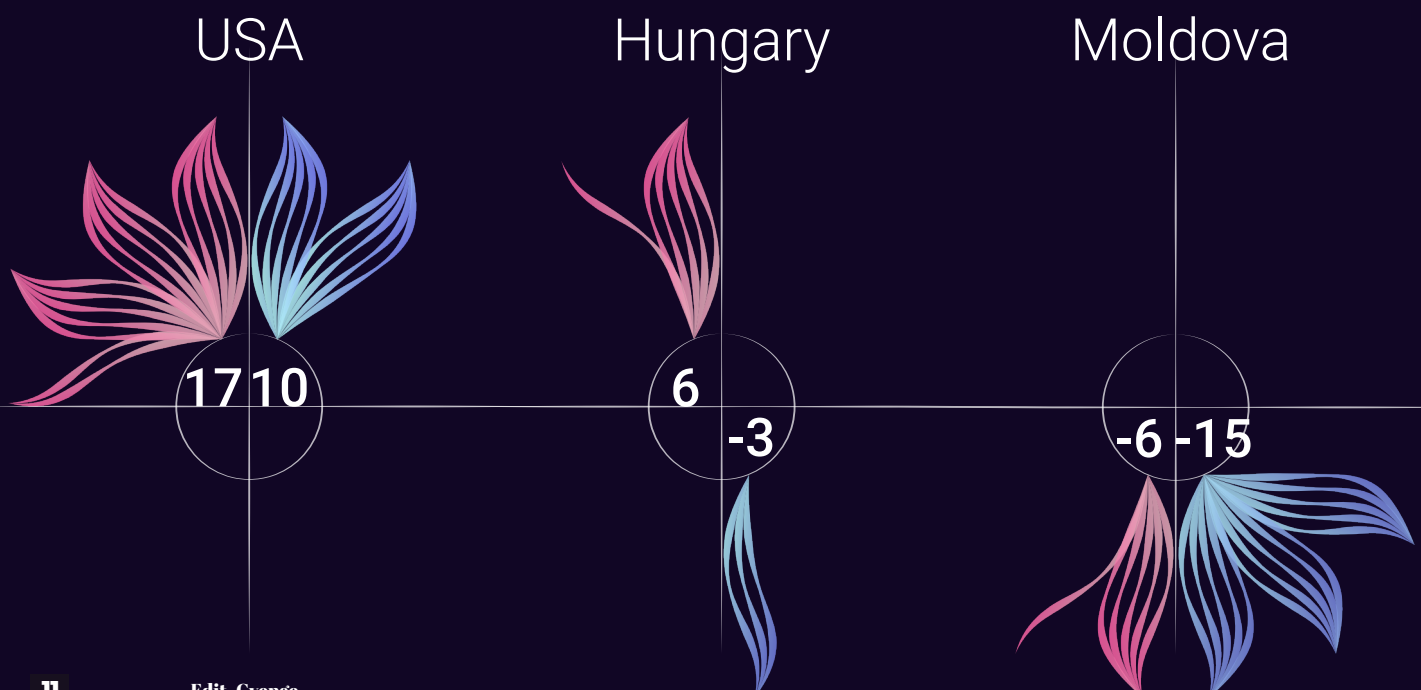
Building a broader sense of reality

What is true and what isn't

We previously talked about the importance of visualizing emotions, the impact of emotions on facts, but how about the impact of facts on emotions?

Emotions can shape out results and trends, but facts and patterns can shape out emotions as well. How this played out in the past couple of years was through a plethora of media articles concerning the COVID-19 pandemic discussions. We somehow intuit how this affected our overall perception of reality, but don't quite know how to measure it. In the following example I'm presenting one of my favorite data visualization projects, made by **David McCandless.** It's called **Mountains out of M**olehills and it essentially compares the number of media articles published regarding certain topics and the actual impact of those topics measured in deaths.

The interactive version is here.

Mountains Out of Molehills
A timeline of media-inflamed fears
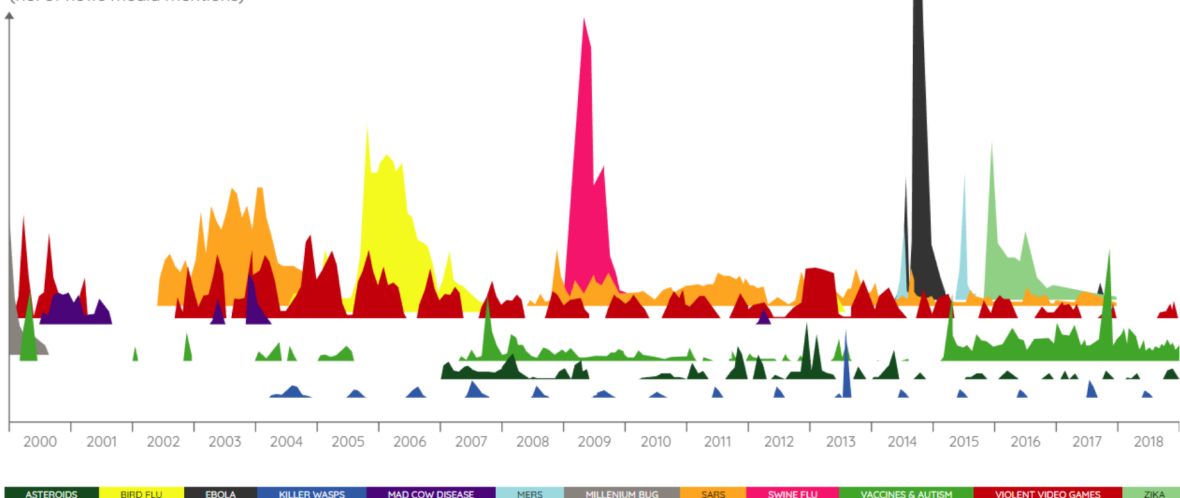
How does this generate an impact?
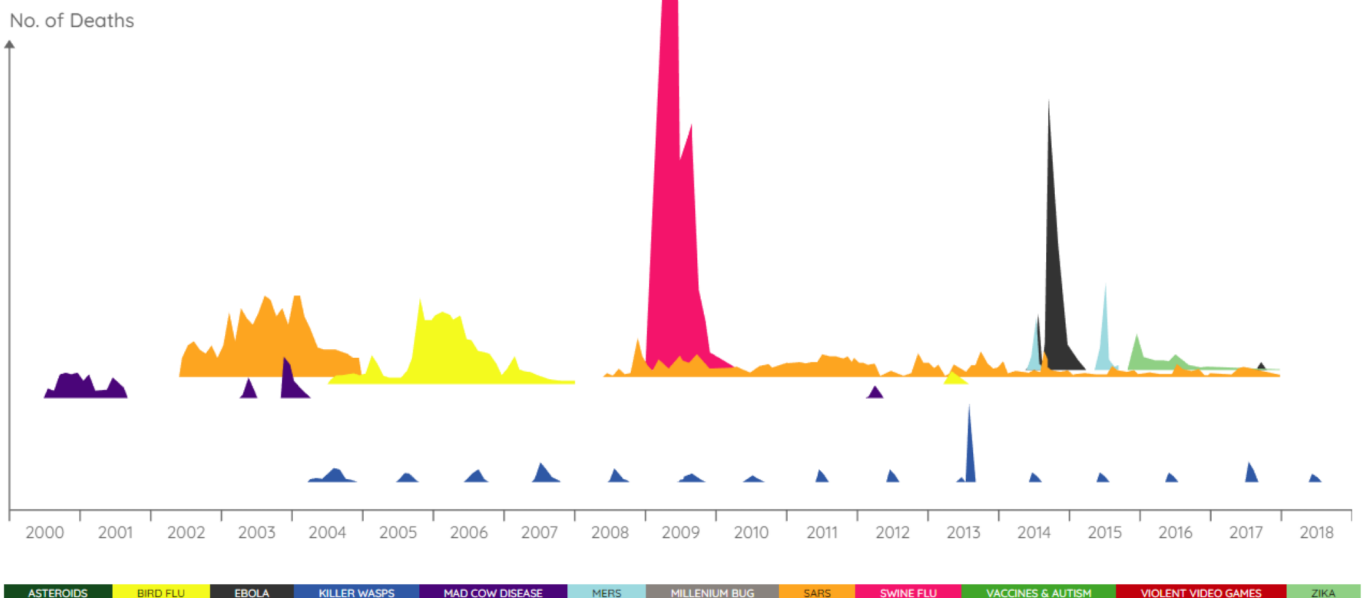
Understanding the value and the scale

Some industries thrive on human reaction, so therefore, on human emotions. Fear, enthusiasm are just some of the feelings that incite to action.

By looking at third party data that generates a reaction and the actual facts can say a lot of things about the intent. Understanding the intent is one step closer to viewing the world more clearly.

The actual number of deaths

Mountains Out of Molehills
A timeline of media-inflamed fears

No. of Deaths

| 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |

| ASTEROIDS | BIRD FLU | EBOLA | KILLER WASPS | MAD COW DISEASE | MERS | MILLENIUM BUG | SARS | SWINE FLU | VACCINES & AUTISM | VIOLENT VIDEO GAMES | ZIKA |

David McCandless, Fabio Bergamaschi // source: Google Trends

align to baseline   scale to fit Ebola   scale by deaths

Conclusion

The ability to identify, understand and visually communicate abstract concepts is a foundational element of human intelligence

Even though abstract concept are more difficult to document, their research and visual representation can lead to valuable insight.

Nowadays companies use several tools to collect data and understand customer reaction, employee expectation, opinion and sentiment on the product or service. What data visualization brings to the table in this case is the overall image, the temperature of feelings which can be useful in future solution drafting and conflict solving.

Data visualization isn't just a process of putting facts and figures in nice bar charts, pie charts, histograms and maps, but a process on giving data a voice of itself to tell a story.