THE SCIENTIST AND THE JOURNALIST

Storytelling with infographics and visualization

Alberto Cairo
University of Miami
www.thefunctionalart.com
Twitter: @albertocairo
After my visit to the Wells Library this morning

How I see YOU

How I see MYSELF
After my visit to the Wells Library this morning

How I see YOU

How I see MYSELF
After my visit to the Wells Library this morning

How I see YOU

How I see MYSELF

www.nick.com

www.pritchettcartoons.com
How does Jimmy Neutron communicate with the caveman?
JIMMY NEUTRON AND THE CAVE MAN

Storytelling with infographics and visualization

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An infographic (or a ‘visualization’) is a visual representation of evidence, a tool for analysis, communication, and understanding.
is there real a clear boundary between
Infographics and visualization?
Infographics
Mapping the 2010 U.S. Census

Browse population growth and decline, changes in racial and ethnic concentrations and patterns of housing development.

North Dakota

2010 POPULATION: 672,591

Population Change: +4.7%

Race and Ethnicity

- Whites: 89% (+2%)
- Black: 1% (+10%)
- Hispanic: 2% (+3%)
- Asian: 1% (+10%)
- Native American: 5% (+10%)
- Multiracial: 2% (+5%)
- Other groups: 0% (+0%)

Data visualizations
Hans Rosling, www.gapminder.com

http://www.gapminder.org/videos/200-years-that-changed-the-world-bbc/
What we can learn together

1. Think of what’s appropriate to show, and how
2. Think about structure and function
3. Think of labeling and storytelling
What we can learn together

1. Think of what’s appropriate to show, and how
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Do we seriously think about the ethics of what we show in our visualizations?

Is it acceptable to visually represent any kind of available dataset, just because it is publicly available?
Donors to Proposition 8 (banning gay marriage)

http://www.eightmaps.com/
This conversation about ethics cannot be limited to academia or to journalism. These datasets are publicly available.
If you want to communicate with the public, it helps to think a bit as a journalist.

What’s your point?
What's your point?

http://www.chrisharrison.net/
What we can learn together

1. Think of what’s appropriate to show, and how
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Graphics and glasses:
With no glasses, the world is noise;
with glasses, part of that noise becomes signal.
does this sound as a no-brainer?

it shouldn’t...
We don’t think about the data deeply enough.

What am I supposed to see in the following map?

SOURCE: XKCD

PET PEEVE #208:
GEOGRAPHIC PROFILE MAPS WHICH ARE BASICALLY JUST POPULATION MAPS
“Let’s just show the data. Readers will figure stuff up”

Visualizing the Paths of 10,000 Taxi Rides Across Manhattan
February 21, 2012 | Using data from 10,000 taxi trips and the Google Maps API, graduate students at Columbia University created this mesmerizing animation of the transit arteries of New York City. More

Refugee Influx Threatens Balance in Lebanon

Many in Lebanon worry that the influx of up to 400,000 Syrian refugees, who are mostly Sunni, may disrupt the delicate balance in the country. Lebanon fought its own sectarian civil war from 1975 to 1990.

NORTH LEBANON
111,700 refugees
Violence has erupted sporadically in this region. Many of the same sects at odds in Syria live in adjacent neighborhoods in Tripoli, the second largest city in Lebanon.

BEIRUT AND MOUNT LEBANON
50,500 refugees

BEKAA
95,300 refugees

In December, 17 Sunni fighters from northern Lebanon were killed by Alawite militaries as they tried to enter Syria to join opposition fighters.

Three Lebanese soldiers and one militant accused of supporting Syrian rebels died in clashes here Feb. 1.

Main ethnic and religious groups:
- Sunni
- Shiite
- Christian
- Alawites
- Druze
- Mixed areas

Syrian rebels have accused Hezbollah forces of crossing the border to support Syrian government fighters in this area.

Let me compare

The Atlantic magazine
Let me compare

The Atlantic magazine
Is it possible to objectively decide which graphic forms are more appropriate?

To a certain point, yes

Think about your audience, your publication, and the questions your graphic should help readers answer. Finally, can your graphic be understood without reading every single label and figure?
Áreas proporcionales al número de votos

**ELECCIONES GENERALES 2008**

- **PSOE**
  - 11.289.335
- **PP**
  - 10.278.010
- **Otros**
  - 3.881.336
- **Abstención+ votos nulos+ votos en blanco**
  - 9.624.498

**ELECCIONES MUNICIPALES 2011**

- **PSOE**
  - 6.275.314
  - (-44.4%)
- **PP**
  - 8.476.138
  - (-17.5%)
- **Otros partidos**
  - 7.245.199
  - (+86.7%)
- **Abstención+ votos nulos+ votos en blanco**
  - 12.717.162
  - (+32.1%)

**Fuente** Ministerio del Interior. RODRIGO SILVA.
ELECCIONES GENERALES 2008

- VOTOS DE PSOE Y PP: 11,3
- VOTOS DEL RESTO DEL CENSO ELECTORAL: 3,9

ELECCIONES MUNICIPALES 2011

- El porcentaje es la variación respecto a 2008

Fuente: Ministerio del Interior. RODRIGO SILVA.
PSOE
2008 2011
11,3 6,3
-44,4%

PP
2008 2011
10,3 8,5
-17,5%

Otros
2008 2011
3,9 7,2
+86,7%
PSOE 11,3
PP 10,3

Generales 2008

En millones de votos

Municipales 2011

Otros 3,9

8,5 (-17,5%)
7,2 (+86,7%)
6,3 (-44,4%)
Obesity is, on average, inversely proportional to education.

Why don’t you show me the evidence of that assertion?
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<th>STATE</th>
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Average: 26.99  Average: 27.20%
This doesn’t work...

Percentage with a BA degree or higher

Percentage of obese people
This is a little bit better, but not much...
Percentage with a BA degree or higher

District of Columbia: 45.7
Massachusetts: 36.7
Colorado: 35.5
New Hampshire: 35.4
Maryland: 35.2
New Jersey: 34.6
Connecticut: 34.2
Vermont: 34.1
Virginia: 33.4
Minnesota: 32.5
California: 31.7
Utah: 30.8
New York: 30.6
Kansas: 30.0
Washington: 29.9
Missouri: 28.1
Arizona: 28.0
Georgia: 27.6
Illinois: 27.4
Rhode Island: 27.2
US AVERAGE: 27.2

Delaware: 26.9
Hawaii: 26.6
Florida: 26.0
Oregon: 25.9
Wisconsin: 25.6
Alaska: 25.5
Montana: 25.5
South Dakota: 25.5
Pennsylvania: 25.3
North Dakota: 25.2
New Mexico: 25.1
South Carolina: 24.9
Nebraska: 24.8
Ohio: 24.6
Nevada: 24.5
Texas: 24.5
Michigan: 24.4
Iowa: 24.3
Tennessee: 24.3
Maine: 24.2
Idaho: 23.8
North Carolina: 23.4
Oklahoma: 22.9
Wyoming: 22.5
Louisiana: 22.4
Alabama: 22.3
Indiana: 21.1
Kentucky: 21
Mississippi: 20.1
Arkansas: 18.8
West Virginia: 15.3

Percentage of obese people

Mississippi: 34
West Virginia: 32.5
Alabama: 32.2
South Carolina: 31.5
Kentucky: 31.3
Louisiana: 31
Texas: 31
Michigan: 30.9
Tennessee: 30.8
Missouri: 30.5
Oklahoma: 30.4
Arkansas: 30.1
Georgia: 29.6
Indiana: 29.6
Kansas: 29.4
Ohio: 29.2
Pennsylvania: 28.6
Iowa: 28.4
Illinois: 28.2
Delaware: 28
North Carolina: 27.8
South Dakota: 27.3
North Dakota: 27.2
Maryland: 27.1
Nebraska: 26.9
Maine: 26.8
Oregon: 26.8
Florida: 26.6
Idaho: 26.5
Wisconsin: 26.3
Virginia: 26
Rhode Island: 25.5
Washington: 25.5
New Mexico: 25.1
Wyoming: 25.1
New Hampshire: 25
Minnesota: 24.8
Alaska: 24.5
Arizona: 24.3
California: 24
New York: 23.9
New Jersey: 23.8
Vermont: 23.2
Montana: 23
Hawaii: 22.7
Connecticut: 22.5
Utah: 22.5
Nevada: 22.4
District of Columbia: 22.2
Colorado: 21
Percentage of people with a BA degree or higher

US obesity average: 27%

People with a BA, US average: 27.2%
States with a larger percentage of people with higher education than with obesity
States with a larger percentage of obese people than of people with a higher education
US average 27.2% BA or higher 27.0% Obese
It is acceptable to encode your data more than once

A população nos países, desde 1950

2010 População total: 6.871.282.744

POPULAÇÃO NOS PAÍSES
O tamanho dos círculos representa a população dos países no ano indicado acima. Passe o mouse sobre os círculos para ver mais detalhes, e clique neles para ampliar a informação. Se deseja procurar algum país, use a caixa abaixo.

Fonte: ONU

http://revistaepoca.globo.com/Revista/Epoca/0,,EMI238256-17445,00.html

ÉPOCA magazine (Editora Globo)
What we can learn together

1. Think of what’s appropriate to show, and how
2. Think about structure and function
3. Think of labeling and storytelling
Apps for Development Competition

Over 1,000 people have registered to support the competition. Click here for more details, to get involved, and to check out the applications that have already been submitted.

Enter by January 10, 2011

The Data Catalog provides download access to over 2,000 indicators from World Bank data sets.
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A oportunidade demográfica

...mas a taxa de fertilidade está abaixo do previsto...

...e mais envelhecida

...o que levaria a uma população menor...

Como o Brasil pode transformar isto em uma oportunidade?
Brazil’s Demographic Opportunity

How Brazil can take advantage of a future with fewer children per couple.

Alberto Carvalho, Francisco Lima, Mario Vongallo

The 2010 Census revealed 3.9 4.6 children per couple in Brazil, down from an estimated 5.5 children per couple in 1980. This trend is expected to continue, with the average number of children per couple projected to be 2.9 by 2050.

This demographic shift presents significant opportunities for Brazil. With fewer children, there will be fewer dependents, freeing up resources for development and investment. Additionally, a younger population can lead to a more productive workforce, driving economic growth.

However, there are also challenges. With fewer children, the elderly population will increase, putting pressure on pension systems. Additionally, the workforce will need to be more productive to compensate for the reduced number of workers.

To seize this opportunity, Brazil needs to invest in education and healthcare to ensure that the population is well-equipped to take on the challenges of a younger workforce.

Each line represents a country or continent.

How Brazil can transform the population challenge into an opportunity:

- As the population ages, the proportion of people of working age increases. Brazil will need to attract more people to provide the labor needed to maintain economic growth and development.
- As the elderly population grows, there is an opportunity to focus on retirement services and healthcare.
- A younger population can also mean a more vibrant and dynamic society, with more people in the workforce and fewer dependents.
Prezado Participante,

Todas as informações prestadas nesta inscrição são de sua inteira responsabilidade. Confira atentamente todos os seus dados.

Após a confirmação da inscrição, qualquer alteração nos dados cadastrais será feita por meio do acompanhamento da inscrição.

O Inep não se responsabiliza por informações incorretas ou não recebidas por motivos de ordem técnica, como falhas de computadores ou outros que impossibilitem a conclusão da inscrição.

A taxa de inscrição para participar do ENEM 2012 é de R$ 35,00 (trinta e cinco reais). No entanto, estão isentos do pagamento da taxa:

- **Automaticamente**: Alunos matriculados no último ano (concluintes) do Ensino Médio em instituições públicas de ensino (federais, estaduais e municipais);
- **Mediante Declaração de Carência**: Demais participantes, desde que declarem carência no ato da sua inscrição e que a declaração seja aprovada pelo Inep.

Versão: 0.1.0 59059
Confira a média e o ranking das escolas na prova do Enem 2010

Pesquise na tabela completa das escolas participantes do Enem e categorizadas por Estado, rede e nível de participação

GERARDO RODRIGUEZ; CAMILA GUIMARAES E ALBERTO CAIRO

ESCOLAS ACIMA E ABAIXO DA MÉDIA  RANKING DE ESCOLAS  PARTICIPAÇÃO DAS ESCOLAS

Escolas acima e abaixo da média nacional no Enem 2010

Com qualquer taxa de participação  Redes pública e particular

100% das escolas  % acima da média  Média  % abaixo da média

Claves do gráfico:
A média nacional das escolas foi calculada de acordo com cada faixa de participação dos alunos na prova. Não foram considerados, no cálculo da média, as escolas sem nota.
Na menor faixa de participação de alunos na prova, a maioria das escolas, em todos os estados, ficam abaixo da média.
Mais da metade das escolas da Bahia, Rio de Janeiro, São Paulo, Minas Gerais, Goiás e do Distrito Federal, na faixa de participação acima de 75%, ficaram acima da média.

What we can learn together

1. Think of what’s appropriate to show, and how
2. Think about structure and function
3. Think of labeling and storytelling
Thank you

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