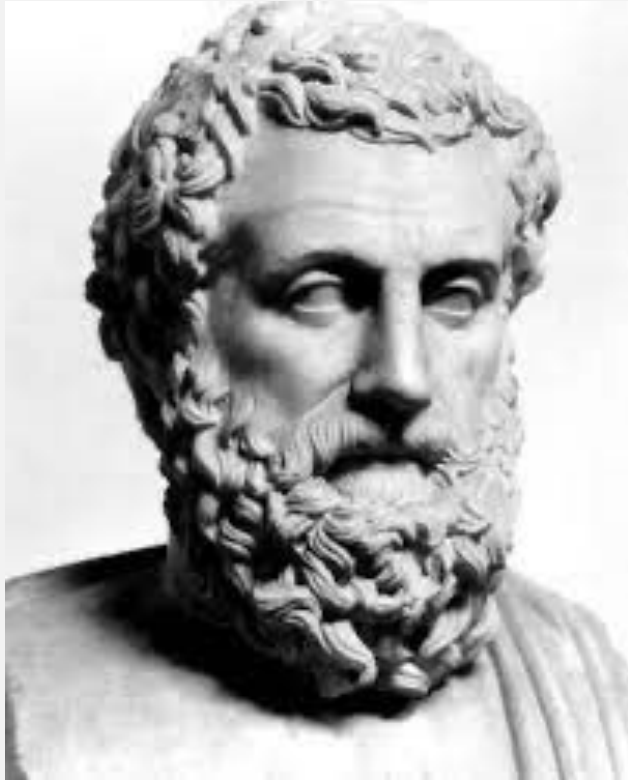


PHYSIOLOGICAL RESPONSE TO DATA VISUALIZATION

PSYC6135: Psychology of Data Visualization
June 2021

Cassy Wyers
Alyssia Wilson

HISTORY OF EMOTION IN COMMUNICATION

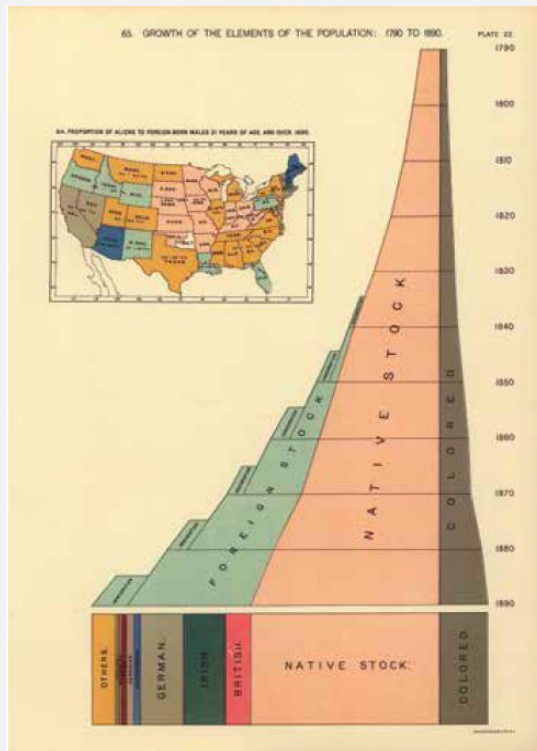


Aristotle

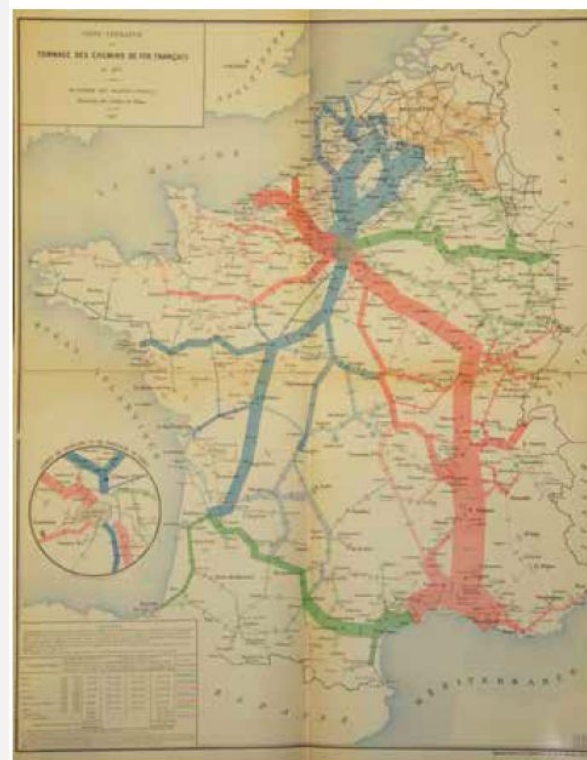


George Campbell

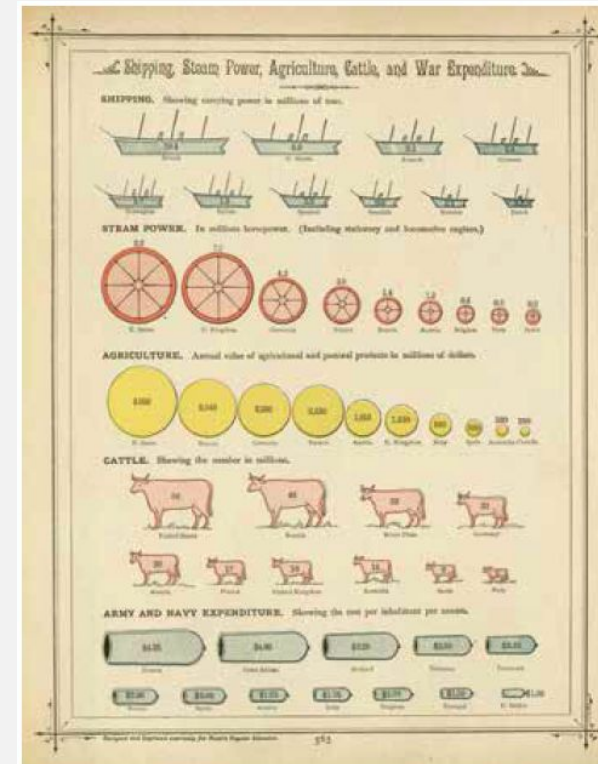
EMOTIONAL APPEALS IN DATA VISUALIZATION IN THE GOLDEN AGE



Colour

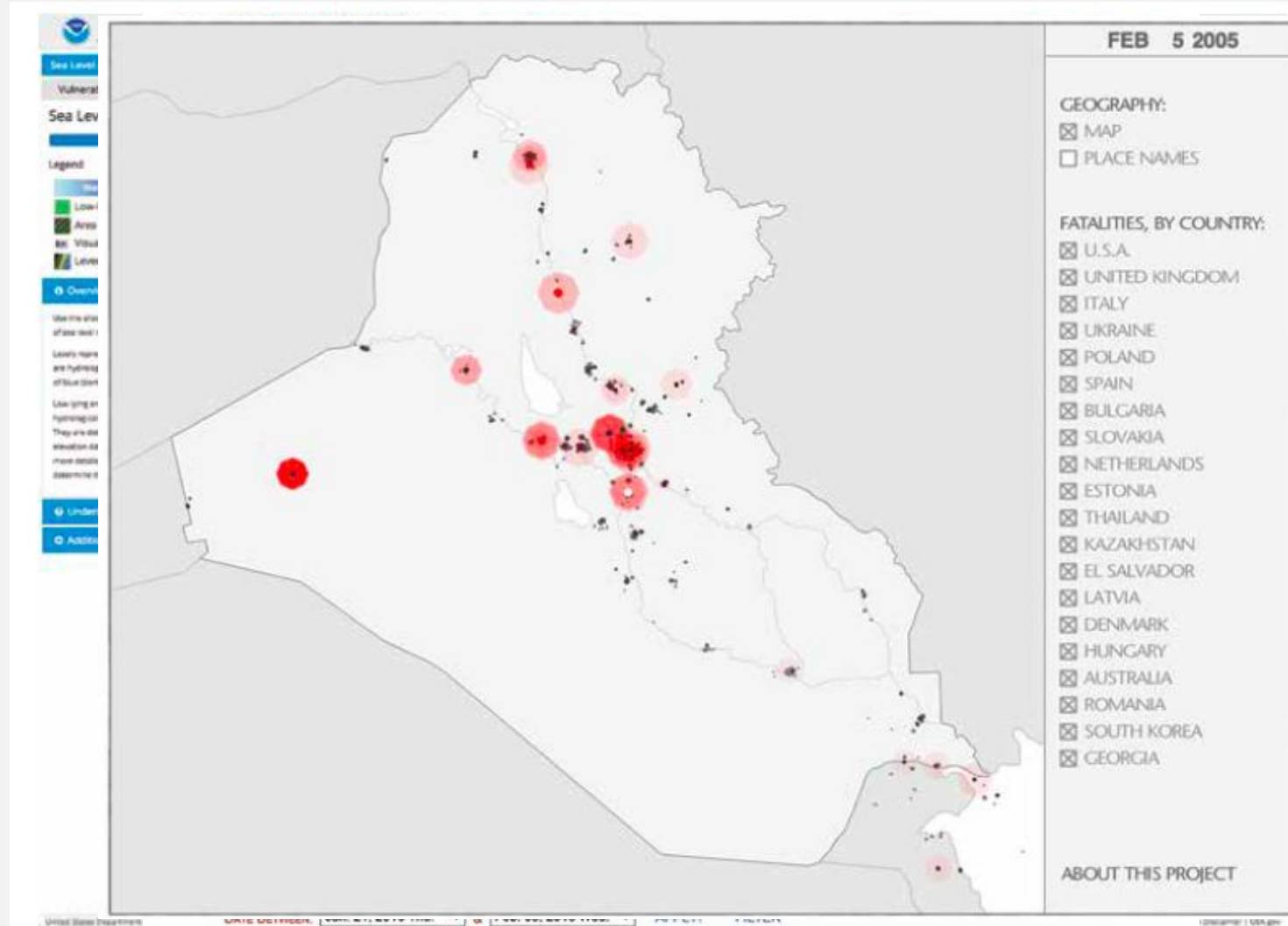


Novelty



Use of pictorial elements

DATA INTERACTION + PERSONAL INVESTMENT

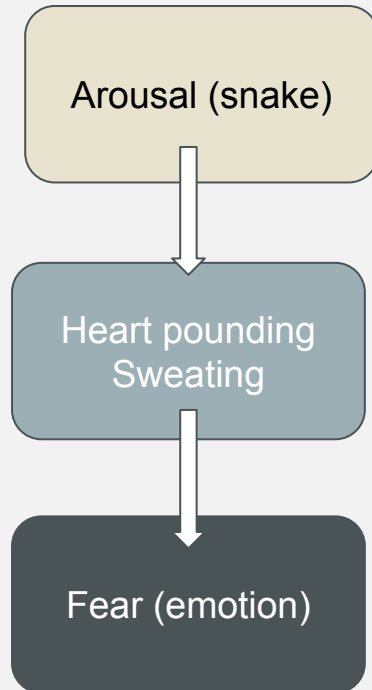


EMOTION + PHYSIOLOGICAL AROUSAL

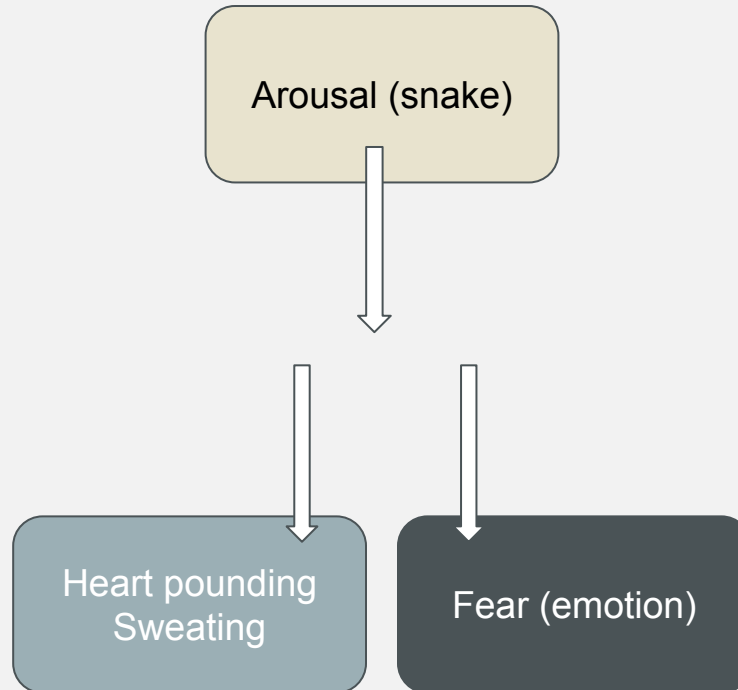


EMOTION + PHYSIOLOGICAL AROUSAL

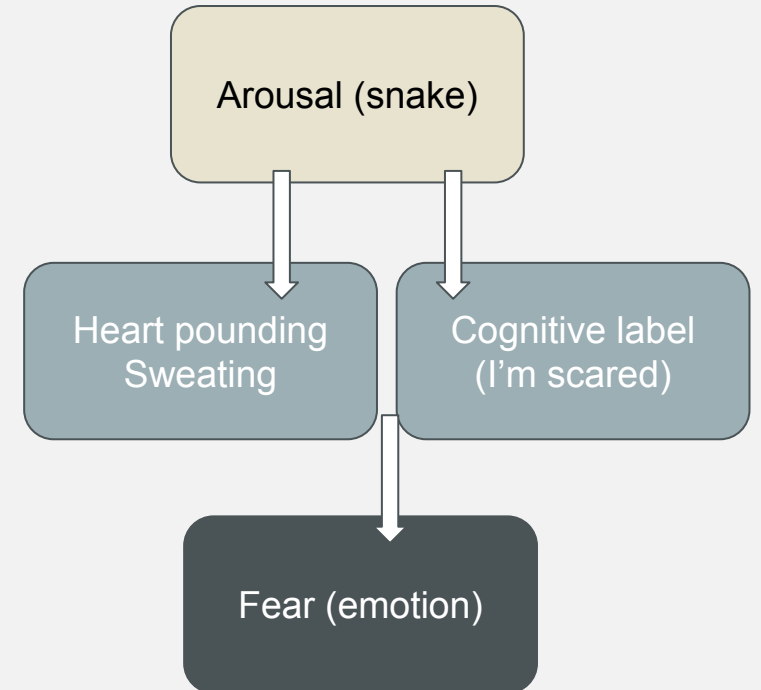
James-Lange



Cannon-Bard



Schachter-Singer



BASIC EMOTION + STATISTICS

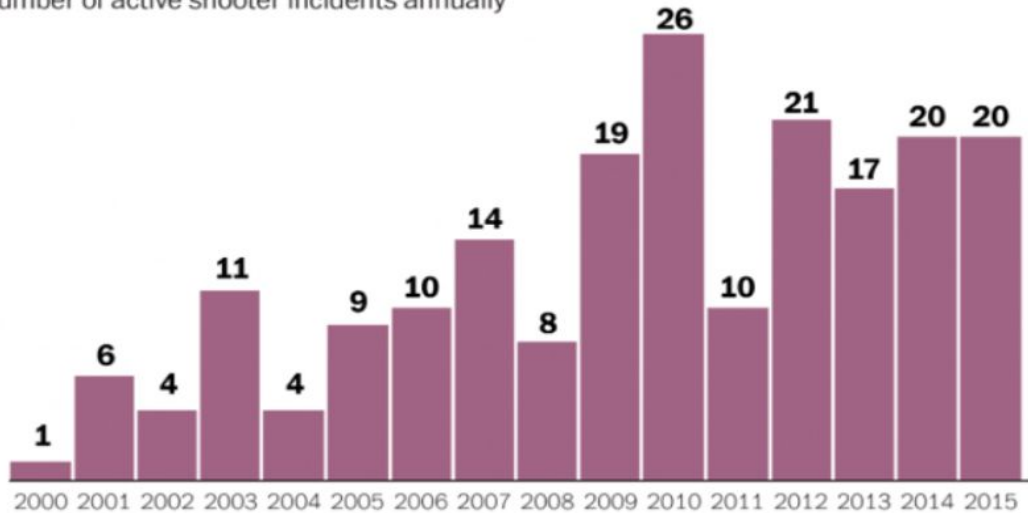
Emotions are evoked by:



EVOKING EMOTION THROUGH DATA VISUALIZATION

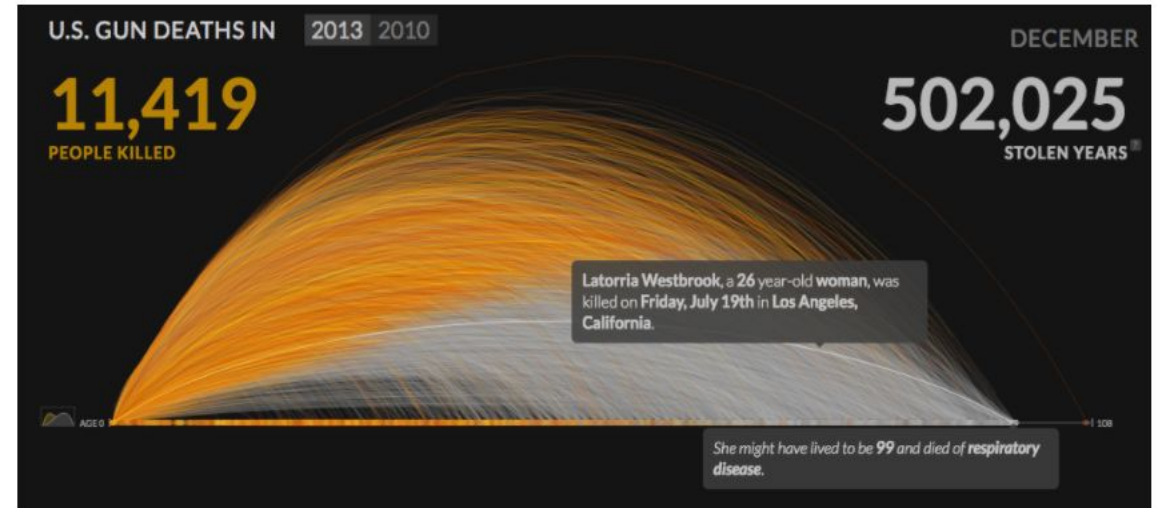
The era of “active shooters”

Number of active shooter incidents annually



WAPO.ST/WONKBLOG

Source: FBI



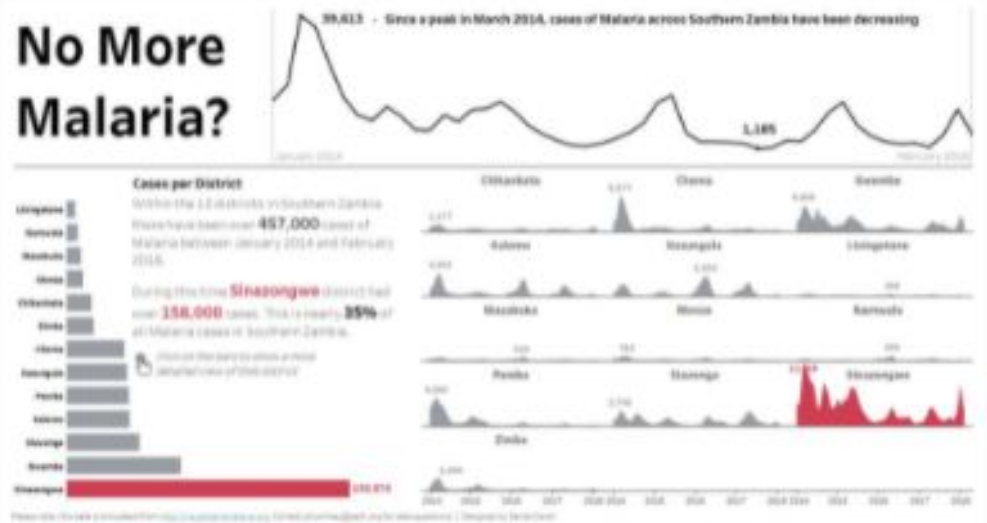
An animated visualization of the “stolen years” of people killed by guns in the United States in 2013. The first image (a) shows the beginning state of the animation and the second image (b) shows the end state. Images by Periscopio.

EVOKING EMOTION THROUGH COLOUR



Image from Atlas of Emotions homepage
 Credit: Paul Ekman
 Click the image to launch the interactive

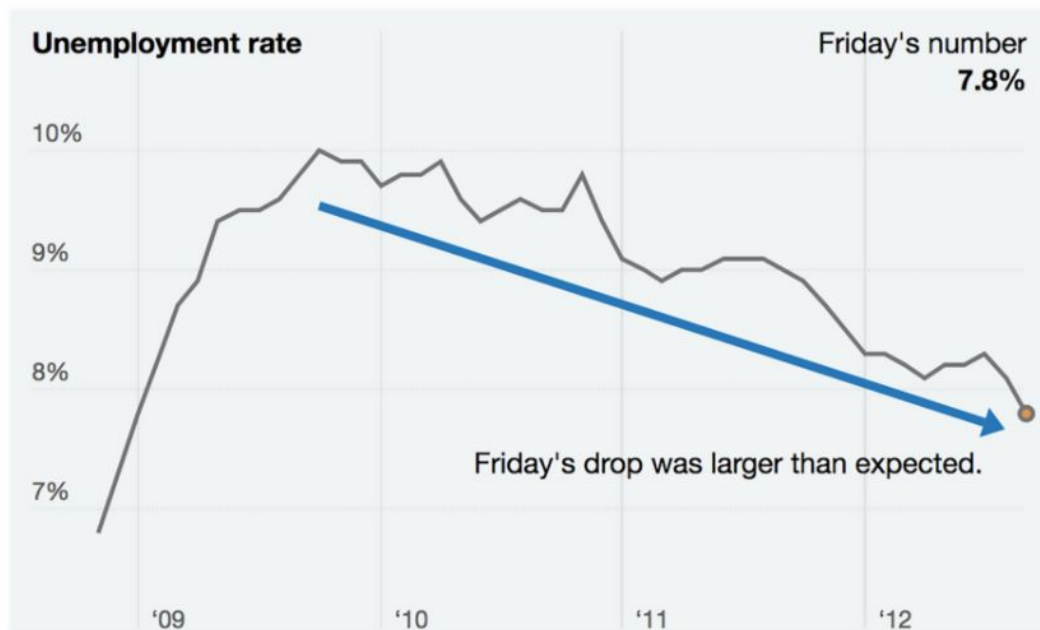
No More Malaria?



A visualization about Malaria in Zambia DANIEL CAROLI

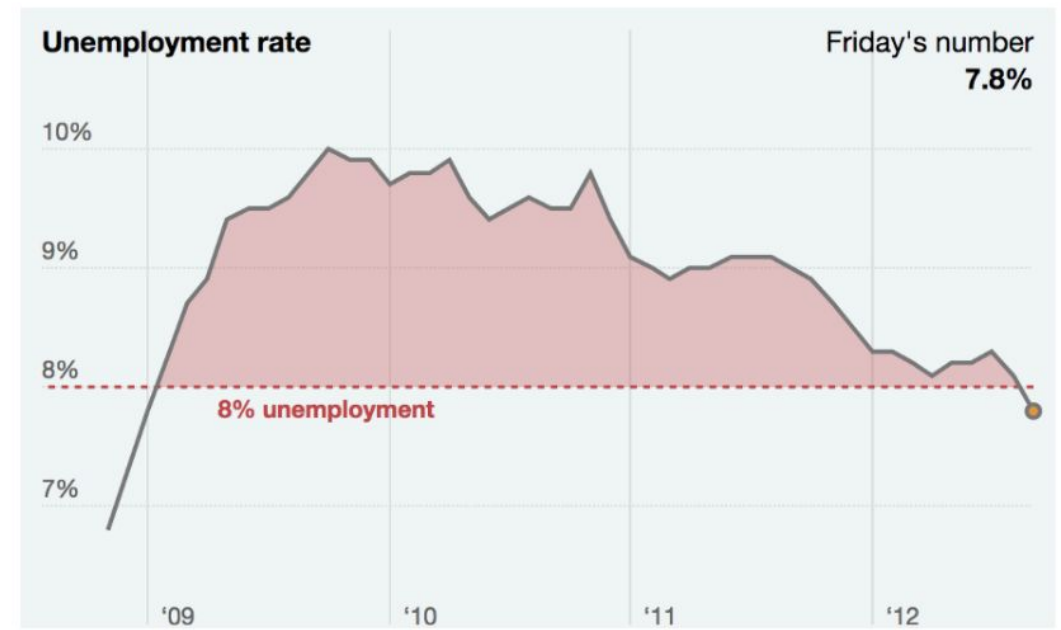
EVOKING EMOTION THROUGH CONTEXT

The rate has fallen more than 2 points since its recent peak.



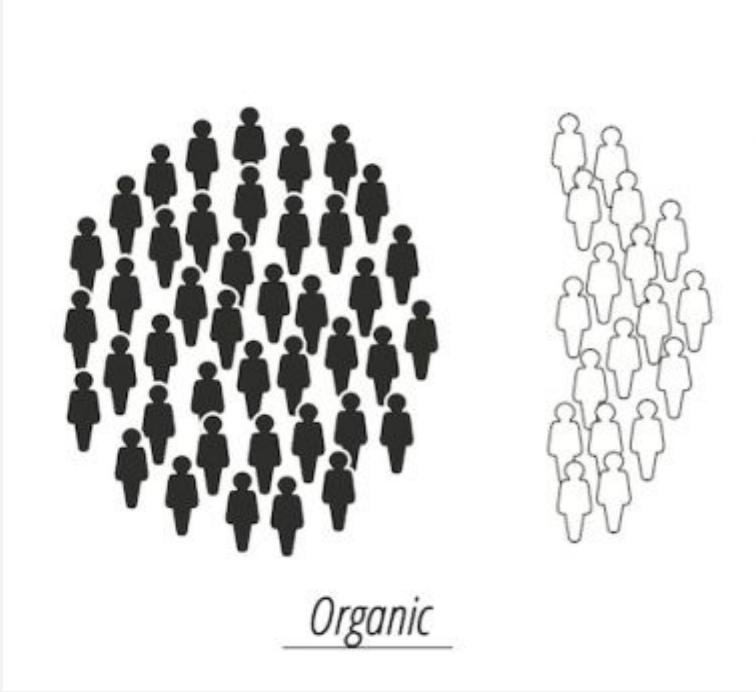
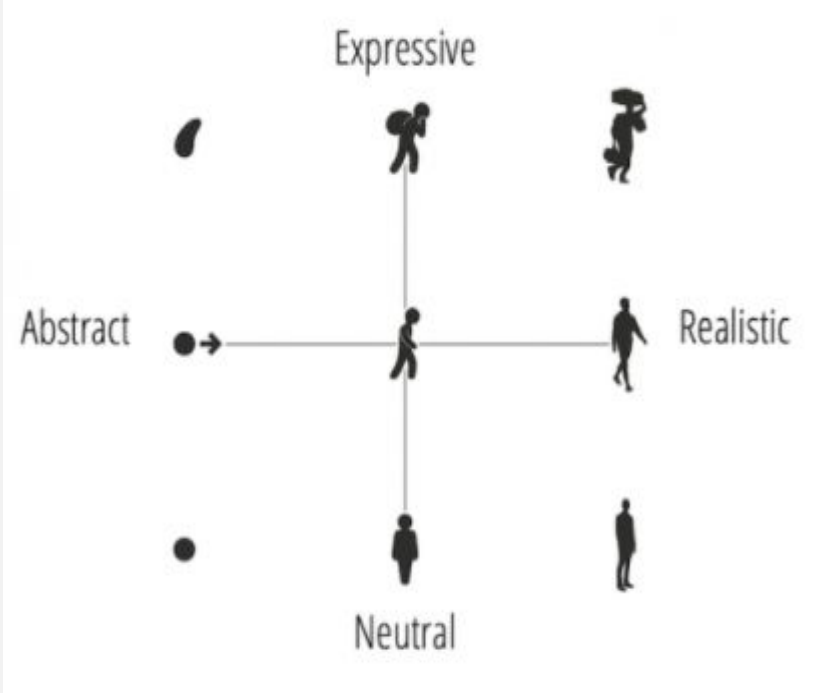
A data visualization of the September 2012 jobs report from the perspective of Democrats. Image by Mike Bostock, Shan Carter, Amanda Cox, and Kevin Quealy, for the New York Times, as cited in [The Curious Journalist's Guide to Data](#) by Jonathan Stray.

The rate was above 8 percent for 43 months.



A data visualization of the September 2012 jobs report from the perspective of Republicans. Image by Mike Bostock, Shan Carter, Amanda Cox, and Kevin Quealy, for the New York Times, as cited in [The Curious Journalist's Guide to Data](#) by Jonathan Stray.

EVOKING EMOTION THROUGH APPEARANCE



PSYCHOPHYSIOLOGICAL RESPONSES TO DATA VISUALIZATION

Arousal Level

- Changes based on visualization type

Attenuation

- The greater the arousal, the more attenuation to data source (reliability) and disconfirming information

Decision Making

- Attenuated information gets included into decision making process

Outcome

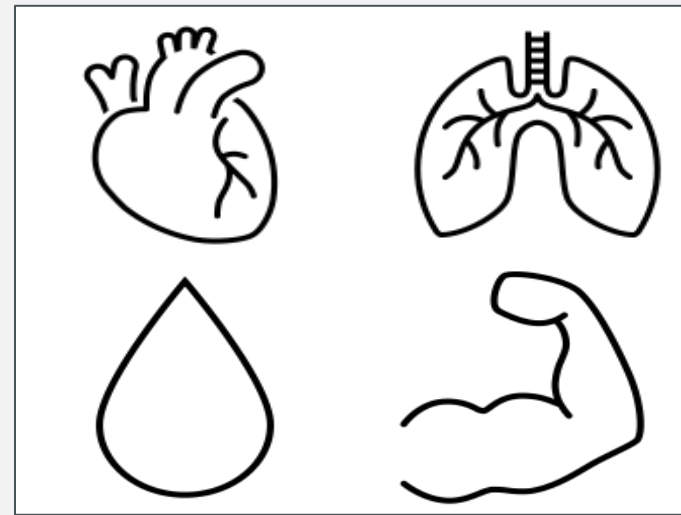
- More balanced outcomes

PHYSIOLOGICAL RESPONSE + PRECONCEIVED OPINIONS

Moral conviction stems from a distinctive mode of mental processing characterized by automatic visceral and emotional reactions.



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EMOTION + HEALTH INFO

The current development of telemedicine and m-health services has changed the way in which individuals monitor their health information. These services offer the possibility to receive and consult health data through computers or mobile devices at home, without medical support at any time. Could this new way of approaching our health data have an impact on our psychophysiological state? This study investigated with an experiment individual reactions to health data visualization on an interface. These reactions were investigated in terms of perceived emotion and stress, behavior and physiological changes (cardiac and electrodermal activities). This study compared individual responses to the visualization of different types of data: health data of the user, health data of another person and weather data. The statistical analysis was performed, based on ultra-short-term features for the physiological responses. The results confirmed that the visualization of personal health data entails the most important responses in terms of perceived stress, duration of data visualization and heart rate variability. Therefore, this study suggests that the conception of health interfaces would require particular attention concerning their content, their design, and their accessibility, in order to limit stress elicited by remote health data consultation.

TAKE HOME MESSAGES

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