

Communicating with Data – Persuasive Vis

Dr. Ab Mosca (they/them)

Plan for Today

- Visualization Rhetoric
- Persuasive Visualization Activity

Editorial Choices

- Visualizations are created by human beings
- In that process editorial choices must be made

Editorial Choices

- Visualizations are created by human beings
- In that process editorial choices must be made
- What aspects of a person's mental model of the world might influence the editorial choices they make?

Editorial Choices

- Visualizations are created by human beings
- In that process editorial choices must be made
- What aspects of a person's mental model of the world might influence the editorial choices they make?
- Is all bias bad?

Rhetoric

rhetoric **noun**

rhēt·ō·ric 're-tə-rik 

[Synonyms of *rhetoric*](#) >

- 1** : the art of speaking or writing effectively: such as
 - a** : the study of principles and rules of [composition](#) formulated by critics of ancient times
 - b** : the study of writing or speaking as a means of communication or persuasion

Visualization Rhetoric

An analytical framework for understanding how design techniques that prioritize particular interpretations in visualizations that “tell a story” can significantly affect end-user interpretation.

Visualization Rhetoric

Editorial Layers

1. The Data
2. Visual Representation
3. Textual Annotations
4. Interactivity

Visualization Rhetoric Techniques

Information Access Rhetoric

- Omission
 - Neglecting to cite data sources
 - Defining variables ambiguously
 - Knowledge assumptions of the end-user
 - Thresholding values
 - Omitting exceptional cases
 - Thresholding axes
 - Filtering
- Metonymy (techniques that require part-to-whole relationships)
 - Selection of variables
 - Averaging
 - Textual and visual summaries
 - Categorizing, binning, or aggregating

Visualization Rhetoric

Provenance Rhetoric

- Data provenance
 - Citing and/or linking...
 - Data sources
 - Additional references
 - Methodological choices
 - Relevant facts
 - Annotating exceptions and corrections
- Representing uncertainty
 - Error bars
 - Descriptions of inferential limits (ex. CI)
 - “leap-of-faith” or forecast annotations
 - Expressions of doubt
- Identification
 - Author bios or personal anecdotes

Visualization Rhetoric

Mapping Rhetoric

- Obscuring
 - Gratuitous third dimension
 - Sizing transformations
 - Discriminability limits
 - Oversizing
 - Neglect to map information to most salient visual judgement types
 - False cause-and-effect
 - Double-axis
- Visual metaphor and metonymy
 - Suggestive spatial mappings (ex. Left = past)
 - Typographical mappings
 - Color mappings
 - Visual noise

Visualization Rhetoric

Mapping Rhetoric

- Contrast
 - Visual contrasts
 - Variable splices
- Classification
 - Grouping by size, position, or color
 - Consistent typographic manipulations
 - Equations of significance
- Redundancy
 - Disaggregating homogenous values or visual marks
 - Visual noise

Visualization Rhetoric

Linguistic-Based Rhetoric

- Typographic emphases
 - Bolding
 - Italicizing
- Irony
 - Rhetorical questions (ex. Titles)
 - Quotation marks
 - Deliberate understatement

Visualization Rhetoric

Linguistic-Based Rhetoric

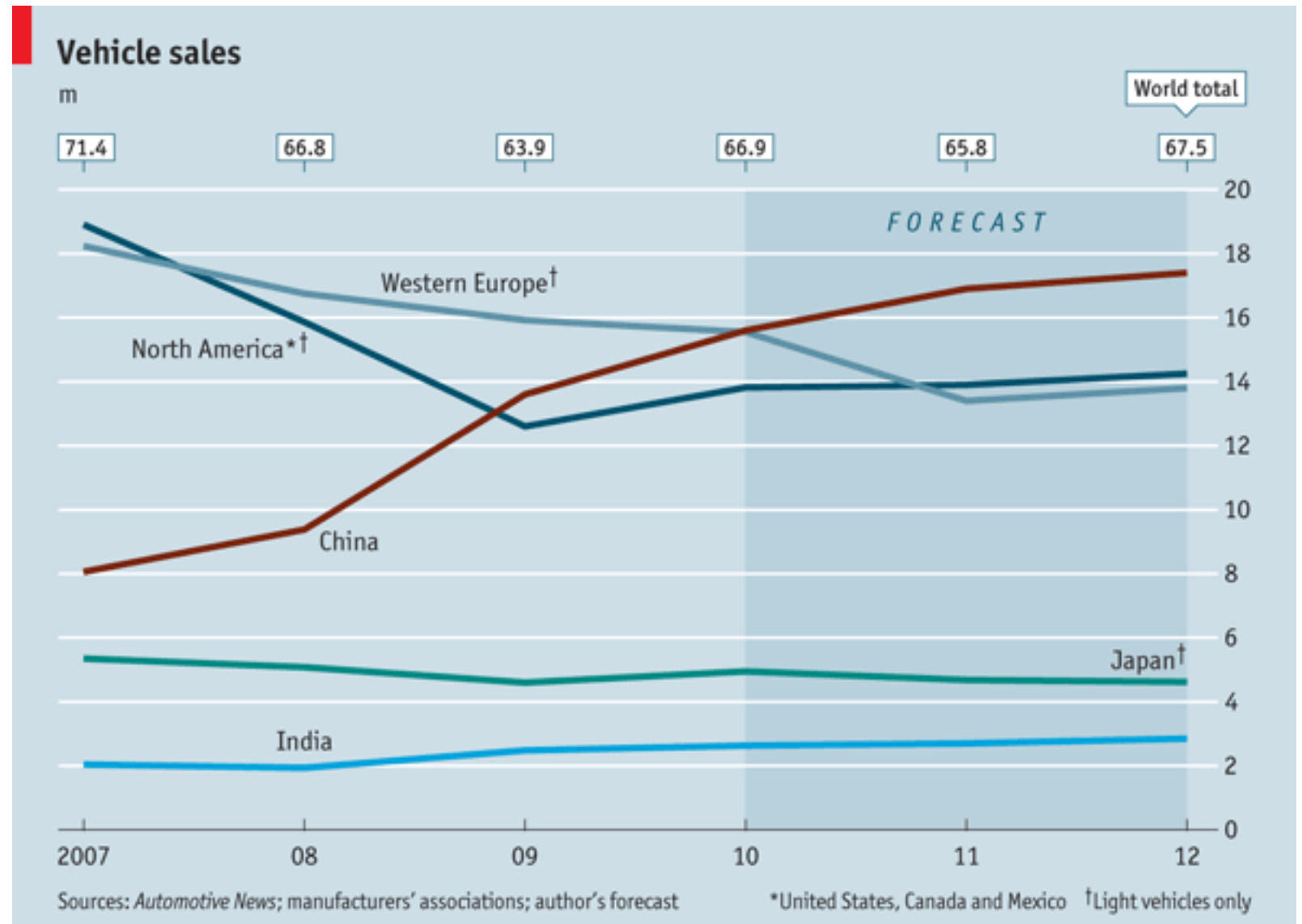
- Similarity
 - Contrast
 - Analogy
 - Metaphoric statements
 - Parallelism
 - Simile
 - Double entendre
- Individualization
 - Apostrophe
 - Sorting and filtering
 - Phrasing or imagery framed from an individual-citizen level view

Visualization Rhetoric

Procedural Rhetoric

- Anchoring
 - Default views
 - Fixed comparisons
 - Spatial ordering
 - Animations
 - Partial animation
 - Search suggestions
 - Goal suggestions
- Filtering

What forms of
Visualization
Rhetoric do
you see here?



What forms of Visualization Rhetoric do you see here?

A Peek Into Netflix Queues

Examine Netflix rental patterns, neighborhood by neighborhood, in a dozen cities. Some titles with distinct patterns are [Mad Men](#), [Obsessed](#) and [Last Chance Harvey](#). [🗨](#)

100 titles that were frequently rented from Netflix in 2009

◀ Previous

Next ▶

Most rented

Least rented

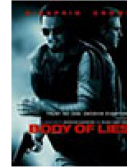
Change how movies are sorted

Most rented

Alphabetical

By metacore

Body of Lies



57

Metacritic
score

100=loved by
critics, 0=hated

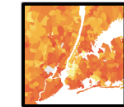
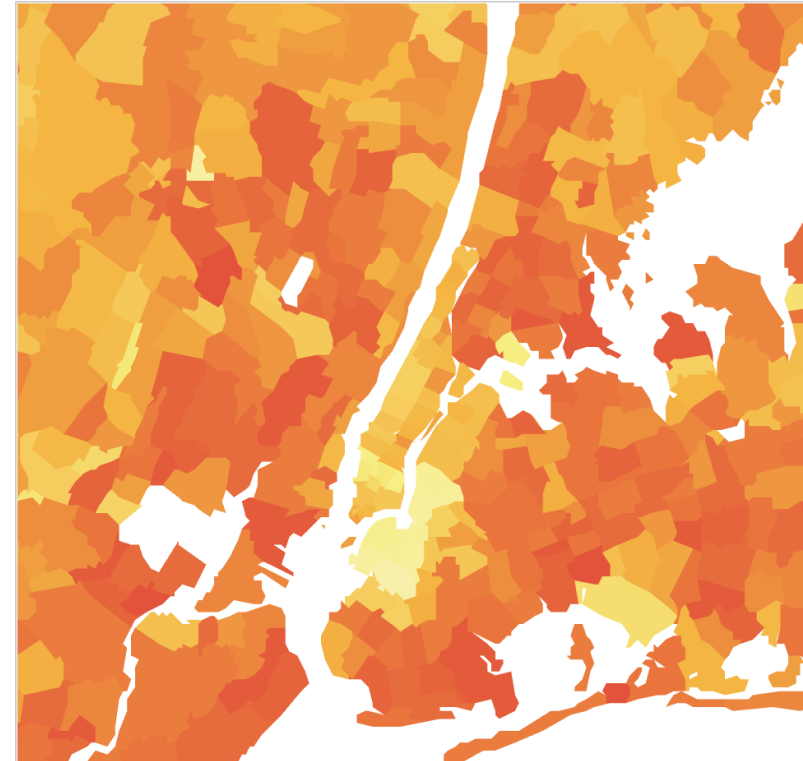
Ridley Scott's new movie, "Body of Lies," raises a potentially disturbing question. If terrorism has become boring, does that mean the terrorists have won? Or, conversely, is the grinding tedium of this film good news for our side, evidence of the awesome might of Western popular culture, which can turn even the most intransigent and bloodthirsty real-world villains into fodder for busy, contrived and lifeless action thrillers?

[Read Rest of NYT Review »](#)

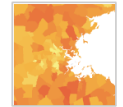
The ZIP codes are shaded according to each movie's rank.

Ranked No. 1

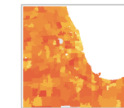
No. 50



NEW YORK



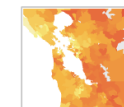
BOSTON



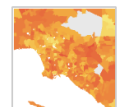
CHICAGO



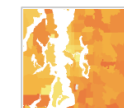
WASHINGTON



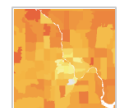
BAY AREA



L.A.



SEATTLE



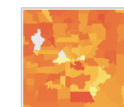
MINNEAPOLIS



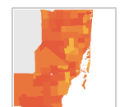
DENVER



ATLANTA



DALLAS



MIAMI

Sources: Netflix provided data on the top 50 rentals in 2009 in each ZIP code. Titles are listed in the approximate order of popularity across selected metropolitan areas. Metascores are from metacritic.com.

By Matthew Bloch, Amanda Cox, Jo Craven McGinty and Kevin Quealy/The New York Times | [Send Feedback](#)

[LINKEDIN](#)

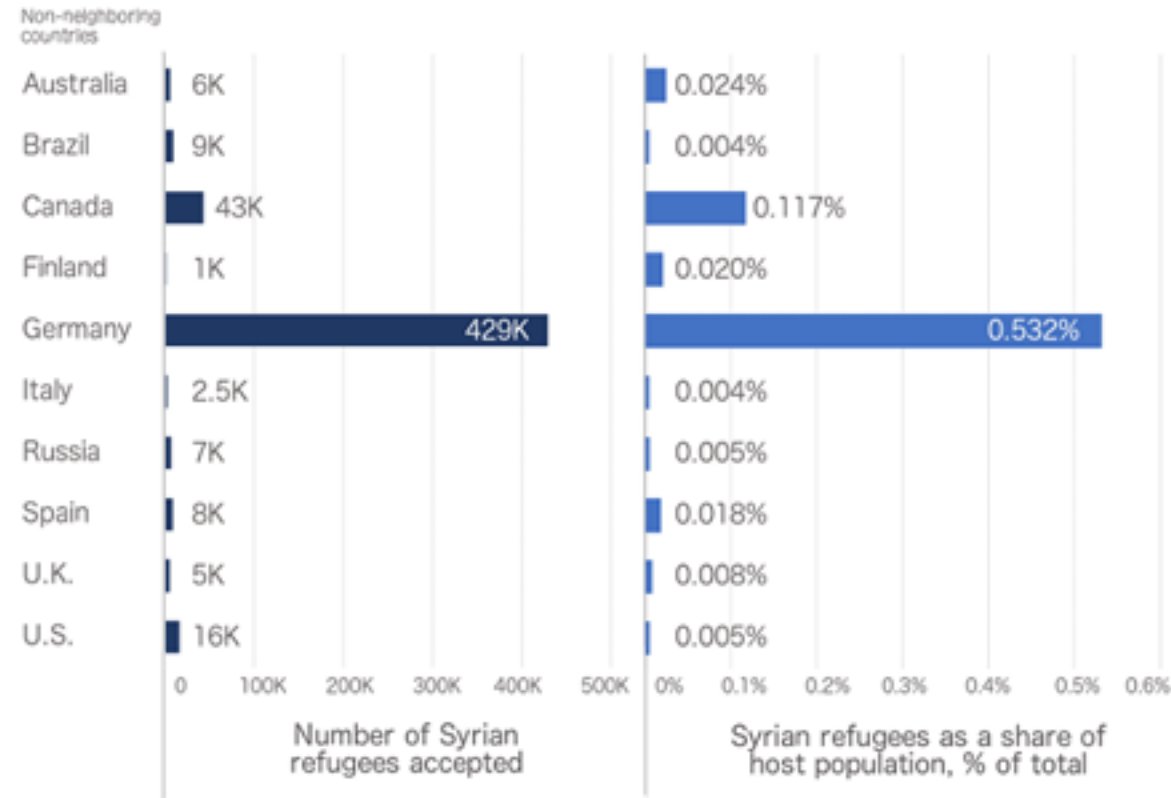
[COMMENTS](#)

[SHARE](#)

Visualization Rhetoric: Framing Effects in Narrative Visualization; Hullman and Diakopoulos

Editorial Choices: Title

U.S. has accepted more Syrian refugees than the U.K., Italy, Russia, the U.K., Spain, Finland, and Australia

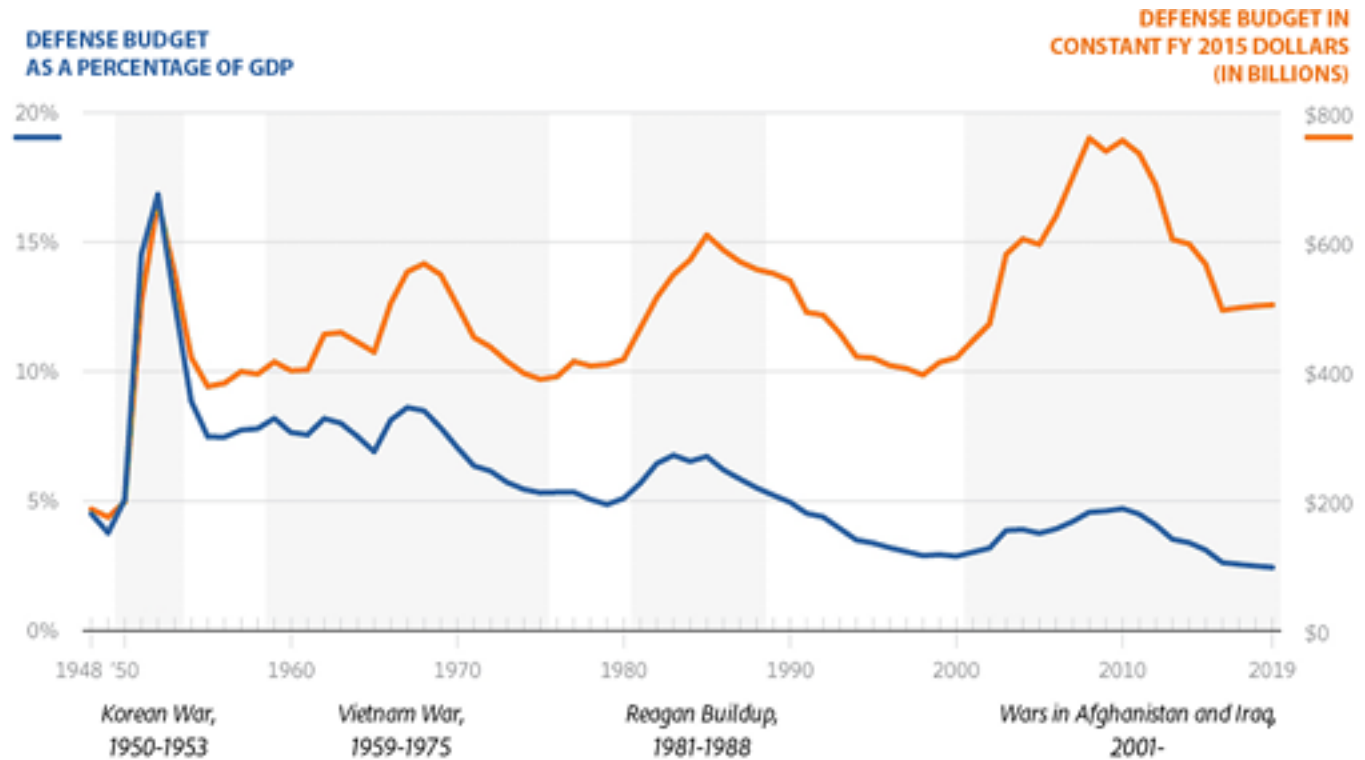


Sources: UNHCR Syria Regional Refugee Response
Worldometers: population by country
International Monetary Fund. Database updated on 12 April 2017

What is the takeaway message of this visualization?

Editorial Choices: Title

Defense budget on a steady increase at
percentage of GDP over the past 50 years.



Sources: U.S. Department of Defense, *National Defense Budget Estimates for FY 2015*, April 2014, (accessed January 16, 2015), and Heritage Foundation calculations.

BG 2989 heritage.org

What is the takeaway message of this visualization?

Editorial Choices: Metadata

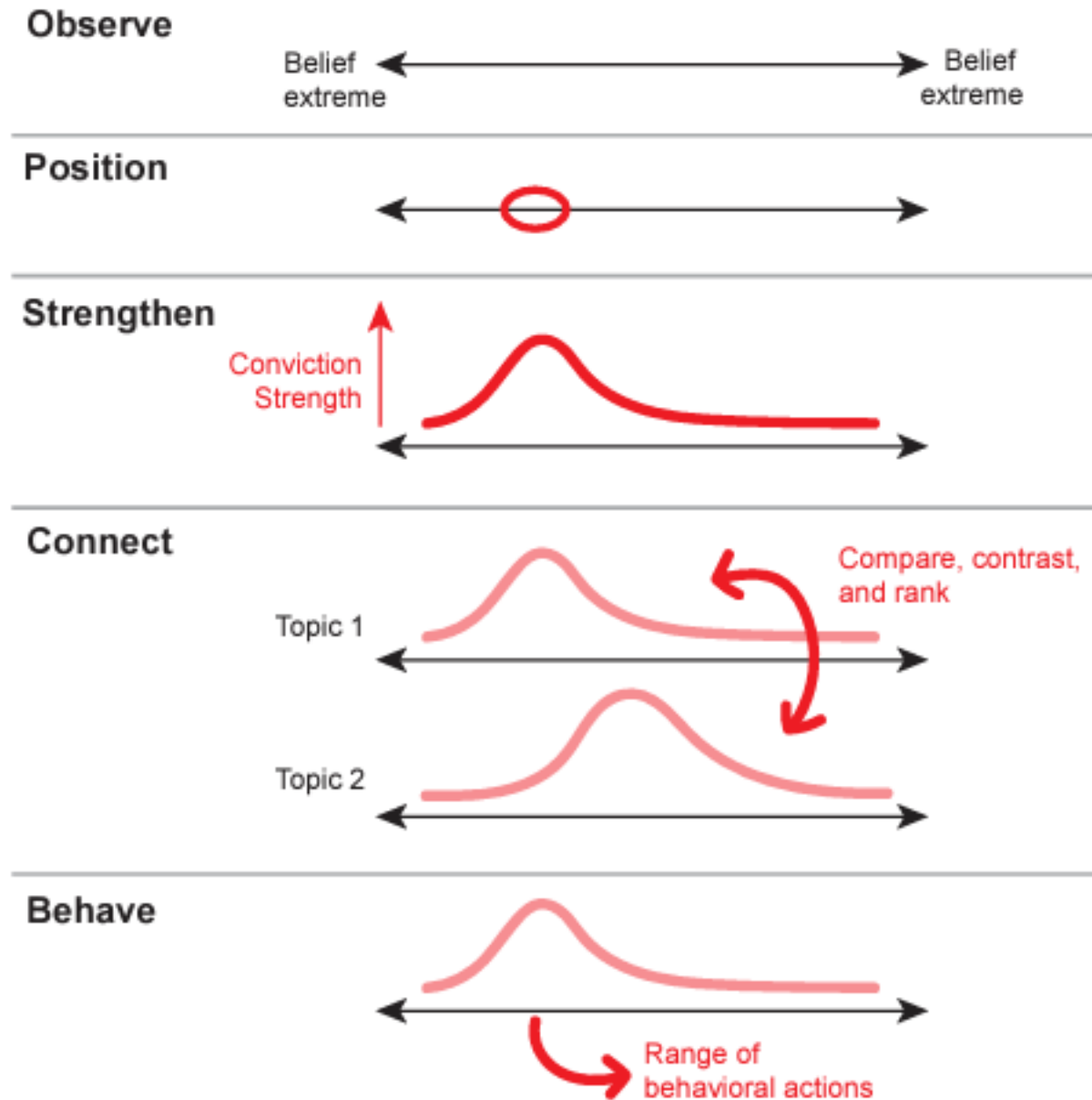
Goals	Categories of Metadata						
	Data Sources	Cleaning & Processing	Perceptual Challenges	Encoding Explanation	Creators	Intended Audience	Other
Confidence in Chart	11% (13)	10% (12)	11% (13)	51% (59)	4% (4)	13% (15)	0% (0)
Confidence in Topic	14% (21)	6% (9)	7% (10)	58% (83)	1% (2)	13% (18)	1% (1)
Key Takeaways	11% (15)	8% (12)	4% (5)	65% (92)	3% (5)	9% (13)	0% (0)
Assess Trustworthiness	51% (62)	15% (18)	5% (6)	5% (6)	13% (16)	9% (11)	2% (2)
Understand Method	32% (40)	21% (27)	4% (6)	20% (25)	6% (7)	17% (21)	0% (0)
Understand Design	10% (12)	24% (27)	3% (4)	17% (19)	6% (7)	39% (45)	1% (1)
Understand Perspective	21% (25)	8% (9)	8% (9)	22% (27)	20% (24)	21% (26)	1% (1)
Satisfy Interest	26% (36)	11% (15)	7% (9)	24% (33)	7% (10)	25% (34)	1% (2)

From Invisible to Visible: Impacts of Metadata in Communicative Data Visualization; Burns et al.

Editorial Choices: Intent

		Persuasion Technique		
		Logos	Pathos	Ethos
Intent	Cognitive	Bar chart (baseball statistics) with an objective for you to remember the data.	Visual imagery (your favorite baseball player) with an objective for you to remember the data.	Data source shown (MLB) with an objective for you to remember the data.
	Affective	Bar chart (of COVID-19 deaths) with an objective for you to take action (social distance).	Visual imagery (coffins) with an objective for you to take action (social distance).	Data source shown (CDC) with an objective for you to take action (social distance).

Editorial Choices: Intent



Activity

- Form groups, each will be assigned one of the following datasets:
 - [Human Development Indicators](#)
 - [Climate Change Indicators](#)
 - [Abortion Data by U.S. State from the Guttmacher Institute](#)
- Explore your dataset and devise a proposition about it: a statement that asserts a judgement or opinion about the trends you might have uncovered
 - Your proposition can be contentious but **cannot** be dehumanizing or demeaning
- Split into two subgroups to design two persuasive visualizations; one for each side of your proposition. If you use deception, it should not be immediately obvious.
- Be prepared to share your visualizations with the class