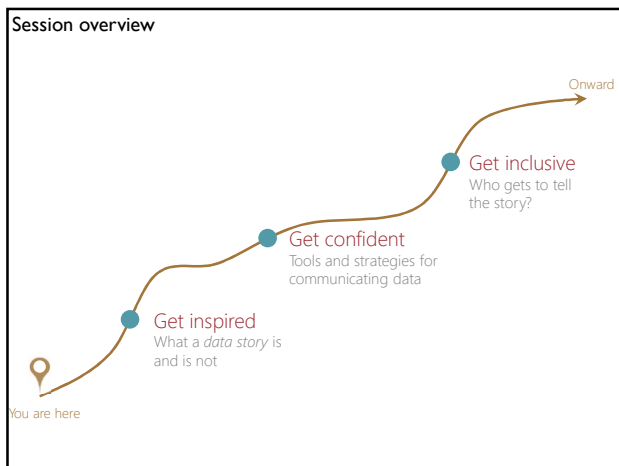


1



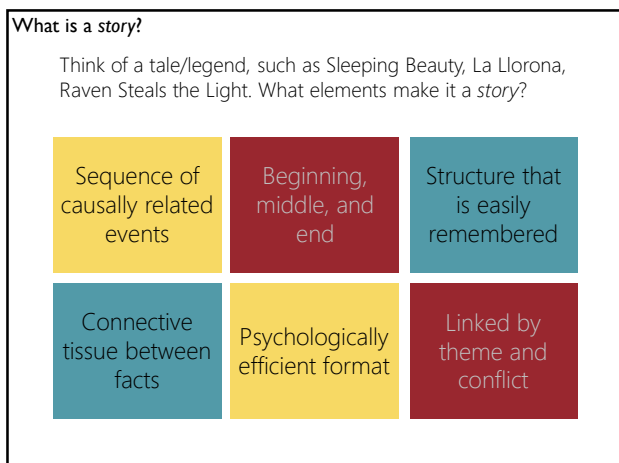
2



3



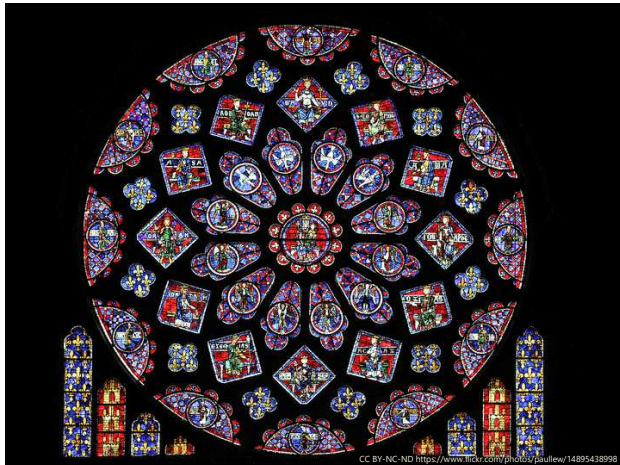
4



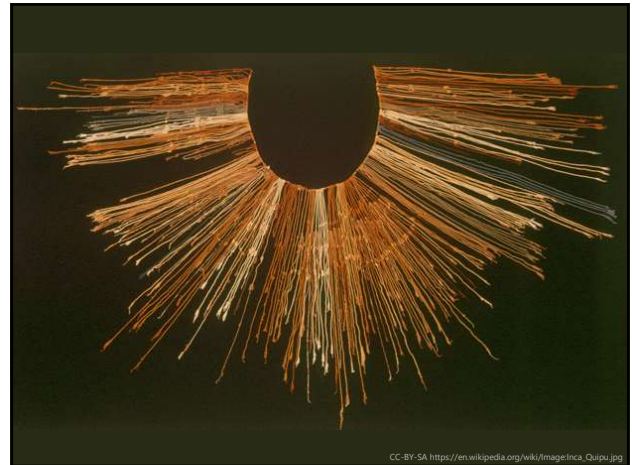
5



6

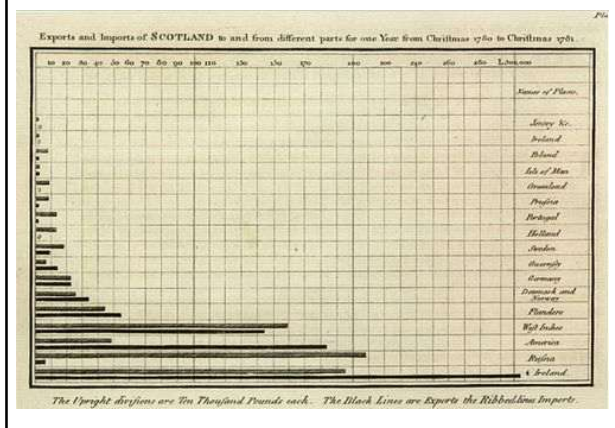


7



8

William Playfair | 1786



9

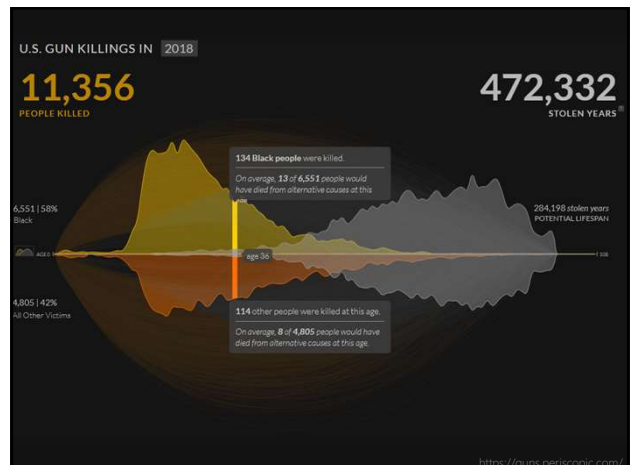
US Gun Killings | 2018



10



11



12

What is a *data story*?Rely on author
and readerCombines
exploratory
and persuasive
techniquesBacked with
data and
annotations

Interactive

Entangles
experience
and affectInvites
verification,
questions, and
alternatives

13

We can improve our
communication
using
data.



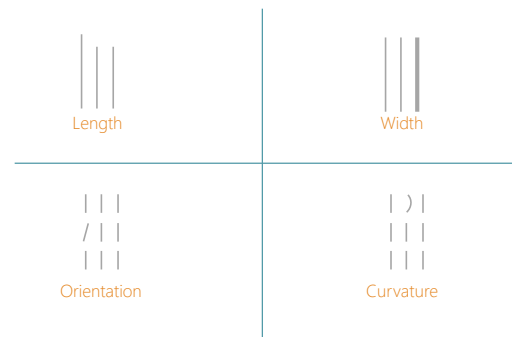
14

Pre-attentive attributes



15

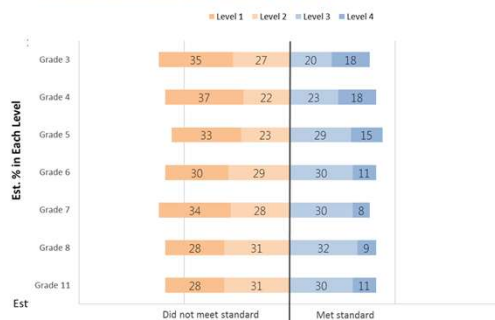
Pre-attentive attributes: Form



16

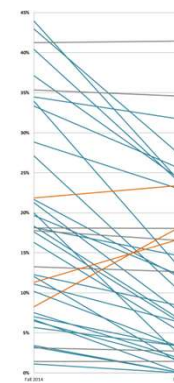
We see length more accurately

Estimated percentage of students scoring at each
achievement level for English language arts



17

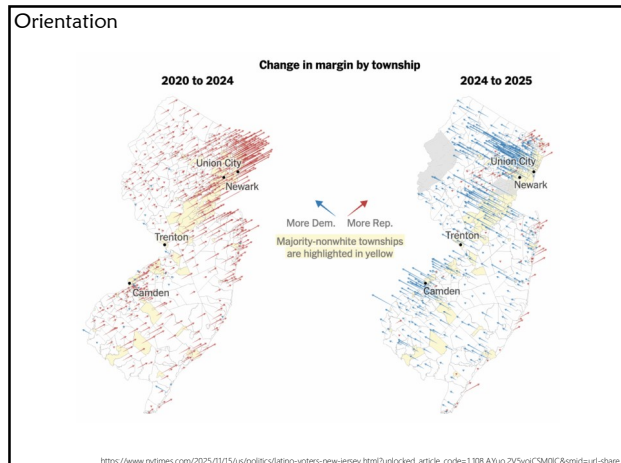
Orientation



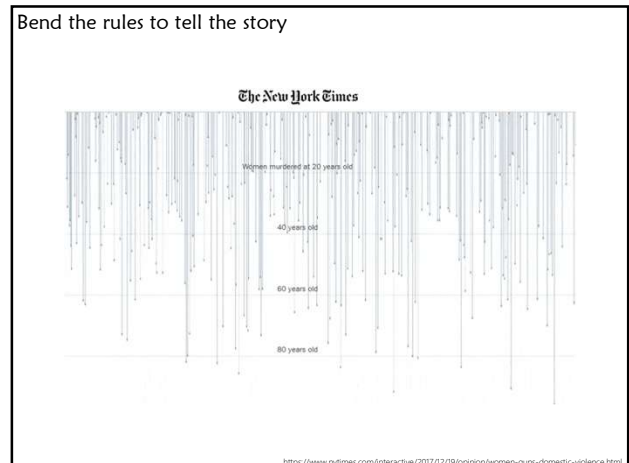
How has the percent of Ds
and Fs assigned by teachers
changed?

- 30 teachers assigned fewer Ds and Fs
- 7 teachers assigned about the same percent of Ds and Fs
- 3 teachers showed an increase in the percentage of Ds and Fs assigned to students

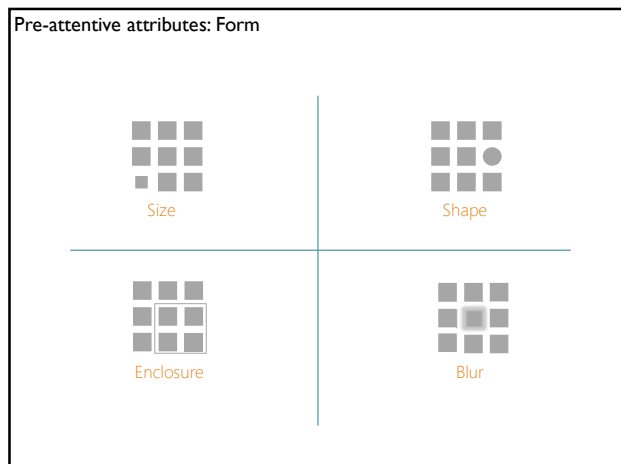
18



19



20

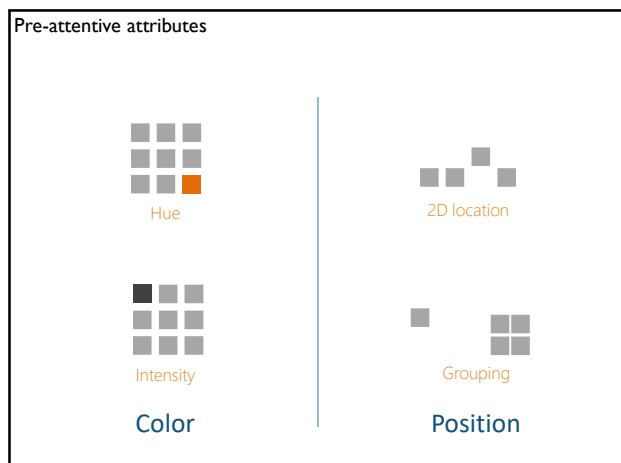


21

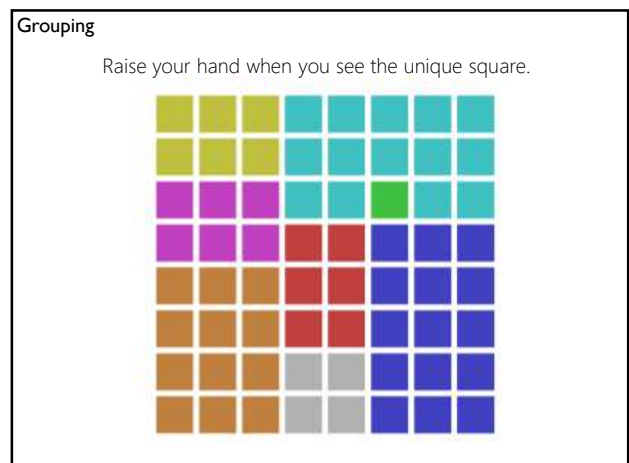
Enclosure and Intensity

Student	Item Number				
Student	1	2	3	4	5
Anderson, Melanie	1	0	0	0	0
Dalton, Craig	1	1	1	0	0
Gallejo, Peter	1	1	1	1	1
Herrera, Sylvia	1	1	0	1	0
LaCrosse, Martin	1	1	1	0	0
Peterson, Michelle	1	0	1	1	0
Sanders, Karen	0	0	0	0	0
Walters, Darren	0	1	1	0	0
Wu, Alice	1	1	0	0	0

22

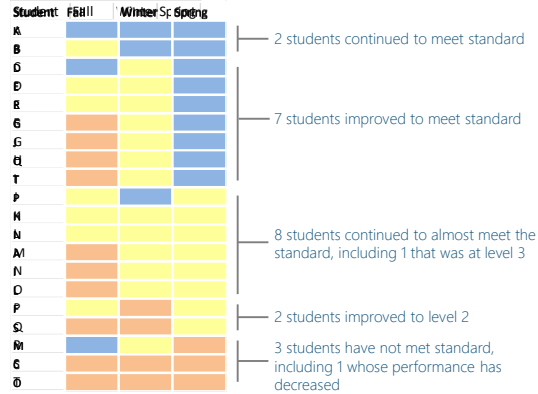


23



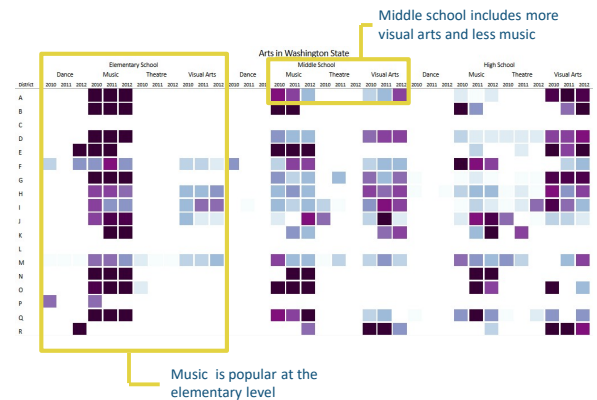
24

Grouping



25

Intensity

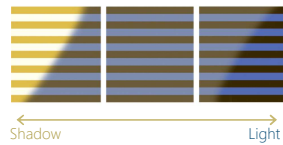


26

What colors are this dress?

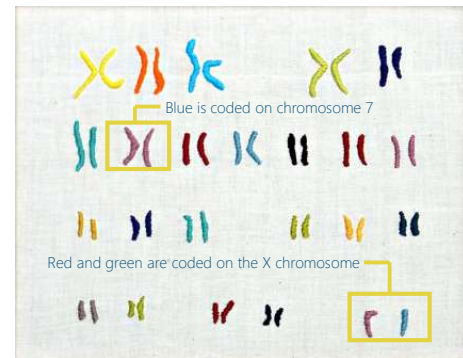


Our brain uses
environmental cues



27

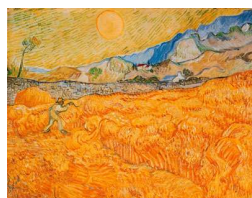
Color perception starts small



CC BY https://www.flickr.com/photos/hey_paul/7611617022

28

Was van Gogh color blind?



Original

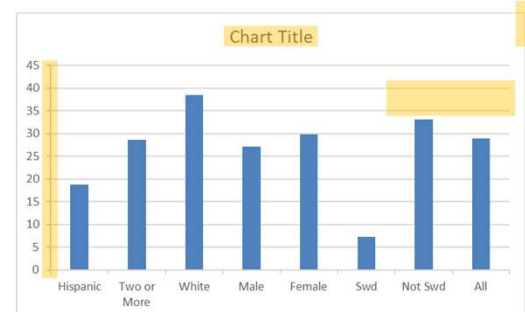


Adjusted

Wheat Field Behind Saint-Paul Hospital

29

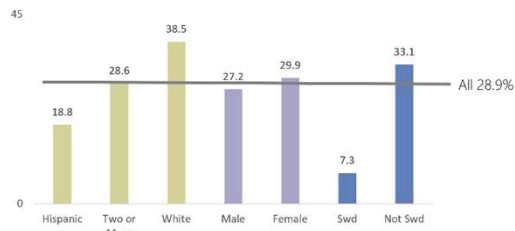
Be mindful of data-to-ink ratio



30

Application

Performance on SBA ELA | Grade X



31

Data visualization checklist

TEXT

Graphs don't contain much text, so existing text must encapsulate your message clearly and concisely.

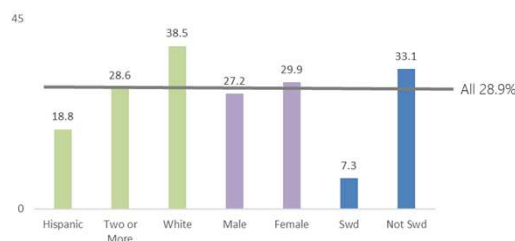
Guideline	Description	Rating
8-20 word descriptive title is a full sentence, left-justified, in upper left	Rather than a generic phrase, use a full, descriptive sentence that encapsulates a takeaway message about the graph's finding or "so what?" When communicating to Western cultures put the title in the upper left. Not centered.	2 1 0 n/a
Subtitle and/or annotations provide additional information	Subtitles and annotations can add explanatory and interpretive power to a graph. Use them to answer potential viewer questions or to highlight specific data points. Annotations only count if they're within the graph, not in a paragraph around it.	2 1 0 n/a
Text size is hierarchical and readable	Titles are a larger font size than subtitles or annotations, which are larger than labels, which are larger than source information. The smallest text is at least 9-point font size for arm's length reading, at least 20 for large room reading.	2 1 0 n/a

<https://stephanieevergreen.com/wp-content/uploads/2024/08/Data-Viz-Checklist-2024.pdf>

32

What's missing? Who's missing?

Performance on SBA ELA | Grade X



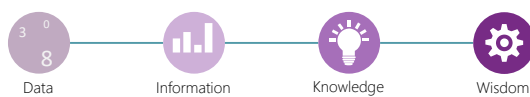
33

We can be more



34

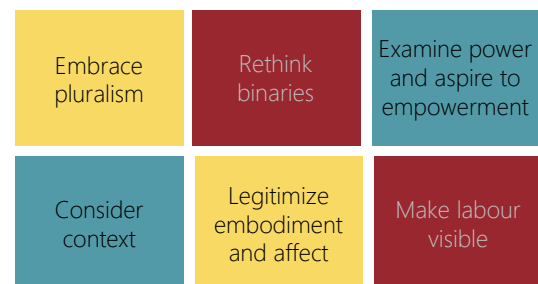
Information hierarchy



- It's all good. More females than males are enrolled in all other AP courses and the life sciences.
- Let's find more females to enroll in these courses!
- What are the structural or institutional changes we could make that would increase the enrollment of females in engineering courses?
- How do we look beyond a deficit model and use the strengths of females to build engineering courses for them?

35

Data feminism



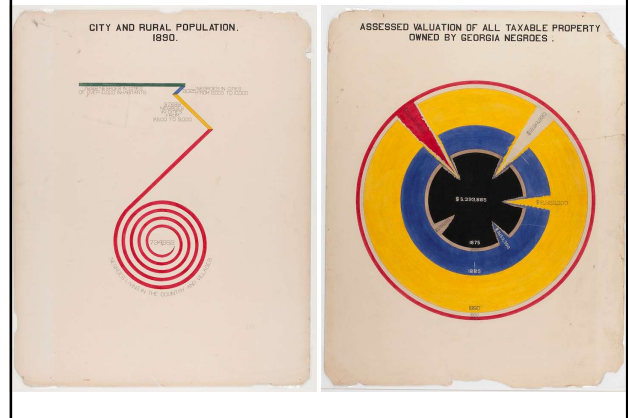
Catherine D'Ignazio and Lauren Klein

36

Pluralism

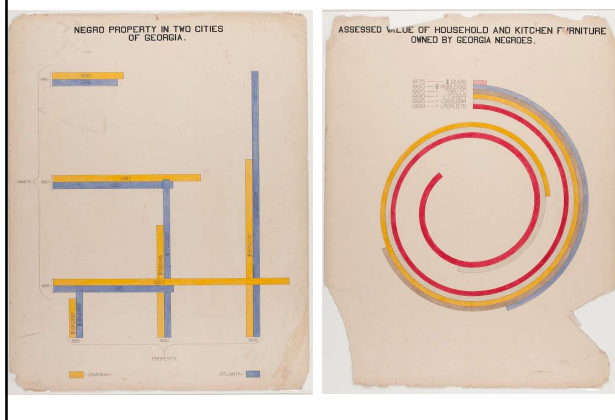
37

W.E.B. DuBois



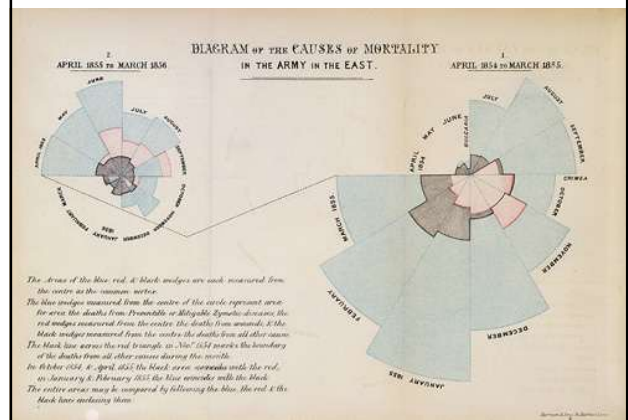
38

W.E.B. DuBois



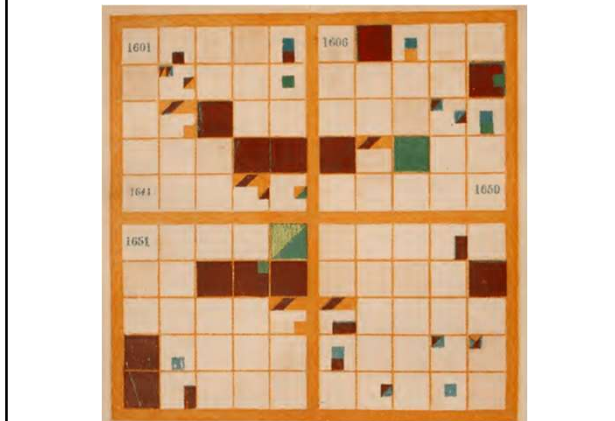
39

Florence Nightingale



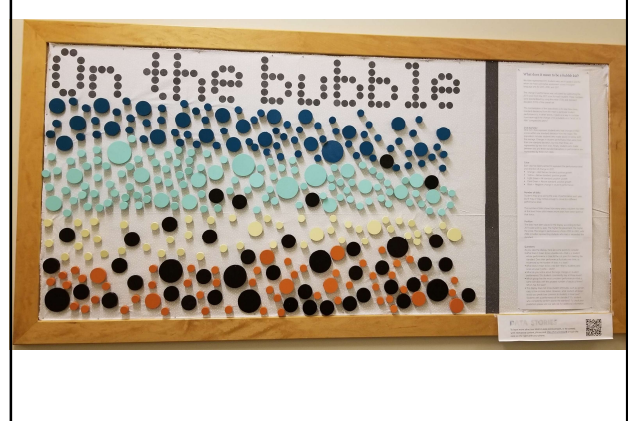
40

Elizabeth Peabody



41

Show the data

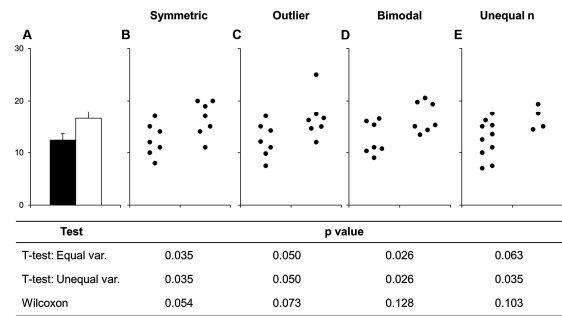


42

See
themselves in the
Story

43

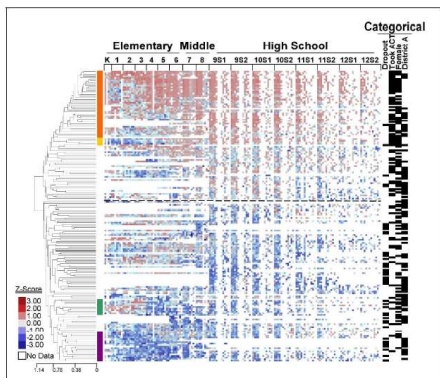
Show the data



Weissgerber, T.J., Miller, N.M., Winham, S.J., and Garovic, V.D. (2015).

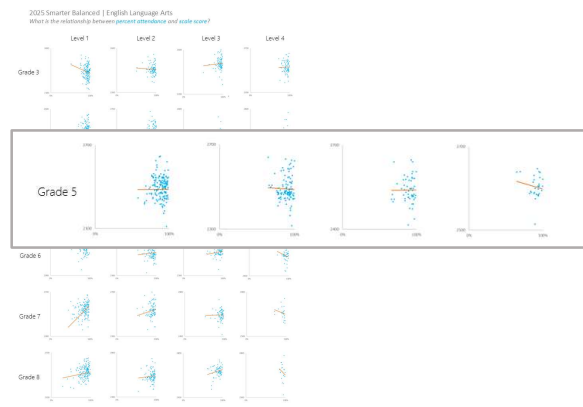
44

Show the data

Hierarchical Cluster Analysis by Alex J. Bowers from <http://www.personline.net/pdfs/53567.pdf>

45

Show the data



46

Show the data...but what if you can't?

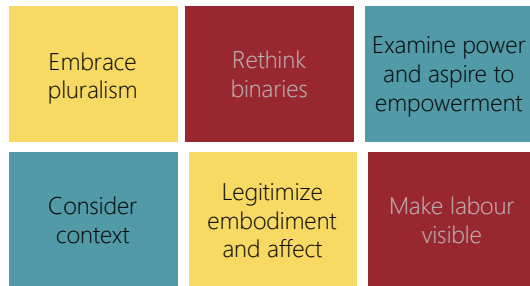
Missing data
pointsSmall n sizeMissing data
set

47

Empathy
provides
Access

48

Data feminism



Catherine D'Ignazio and Lauren Klein

49

Intersectionality

The term *intersectionality* was coined by Kimberlé Crenshaw in 1989. She describes how interlocking systems of power affect those who are most marginalized in society.

Intersectionality considers a collection of factors that affect an individual in combination, rather than considering each factor in isolation.

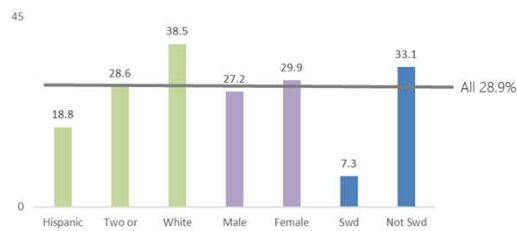


CC-BY-SA Mohamed Badame

50

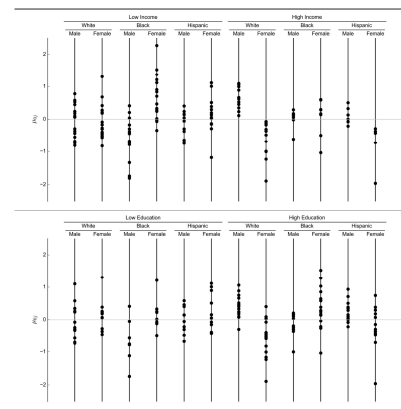
Representing intersectionality

Performance on SBA ELA | Grade X



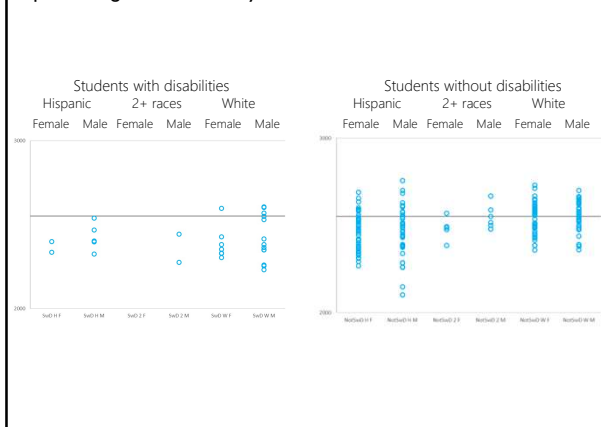
51

Representing intersectionality


<https://www.sciencedirect.com/science/article/pii/S0277953617306664>

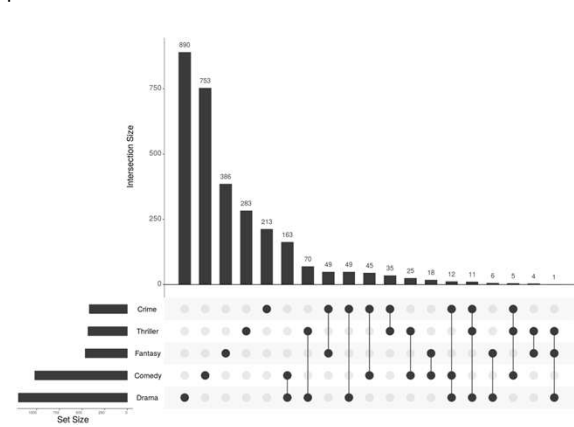
52

Representing intersectionality



53

UpSet Plot



54

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Management

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360.426.1687
Shelton School District
700 S First St
Shelton WA 98584



Final presentation and resources:
<https://github.com/tricherson/WERA-2025>