

Causality for Data Literacy

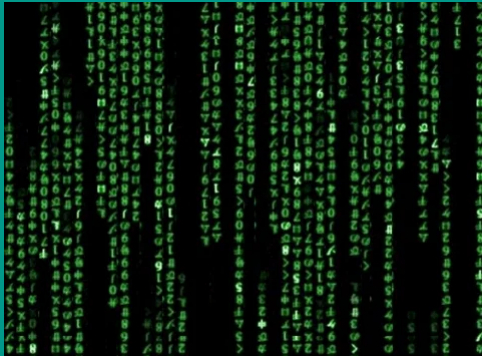
DoDSc Kolloquium

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Data

Data, the *crude oil* of the 21st century (?)



This time we should be more responsible ...

via GIPHY

via GIPHY

Data Literacy

Data Literacy Framework

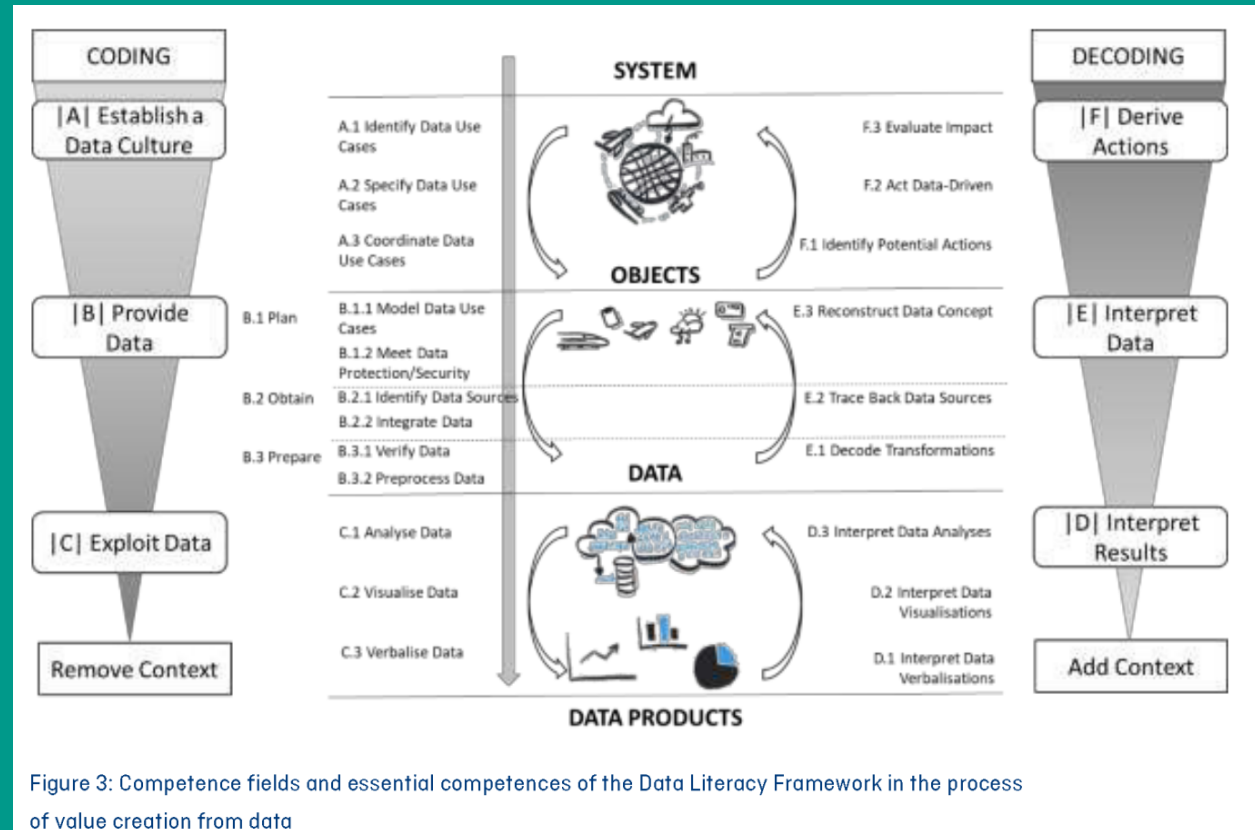


Figure 3: Competence fields and essential competences of the Data Literacy Framework in the process of value creation from data

Schüller (2020)

Motivation

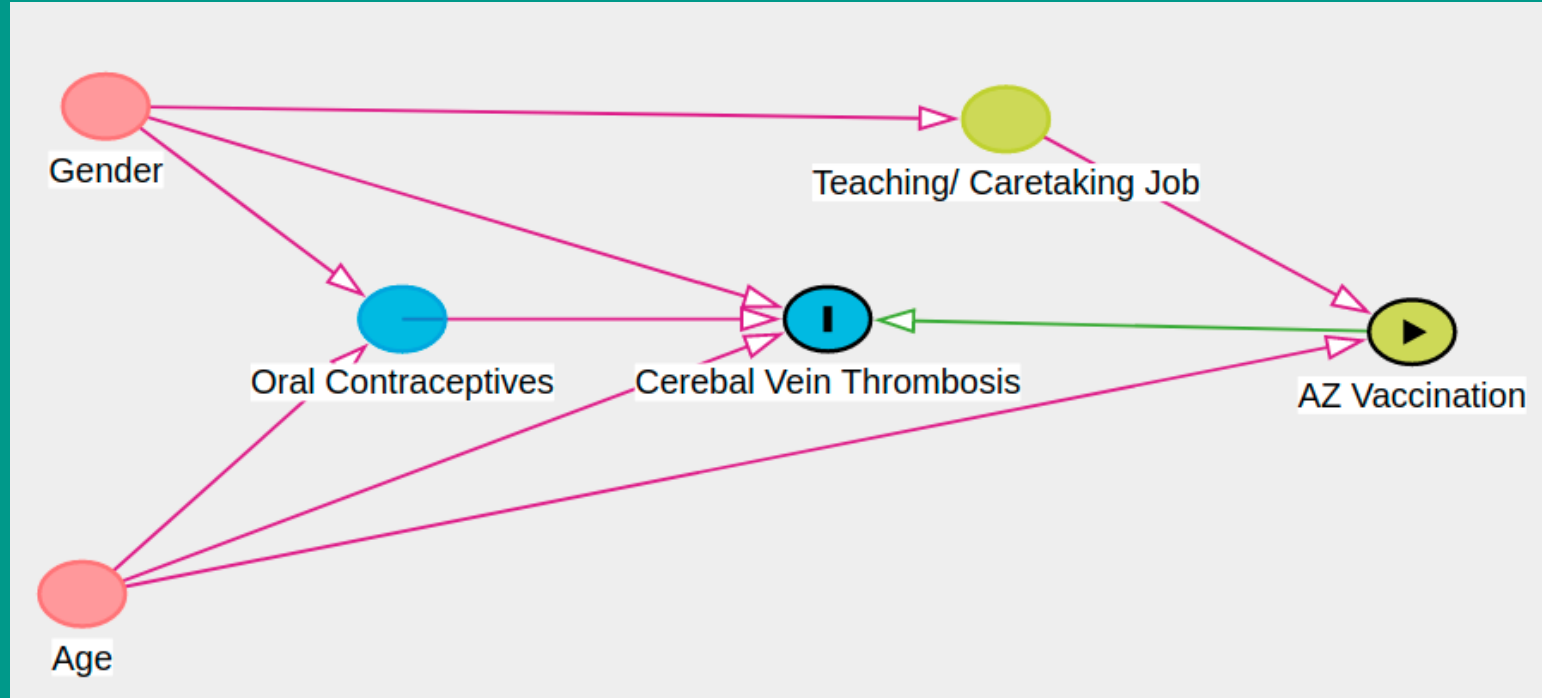
A Quote

Utts (2021):

One of the most common mistakes made in the media is to attribute cause and effect relationships when they are not warranted.

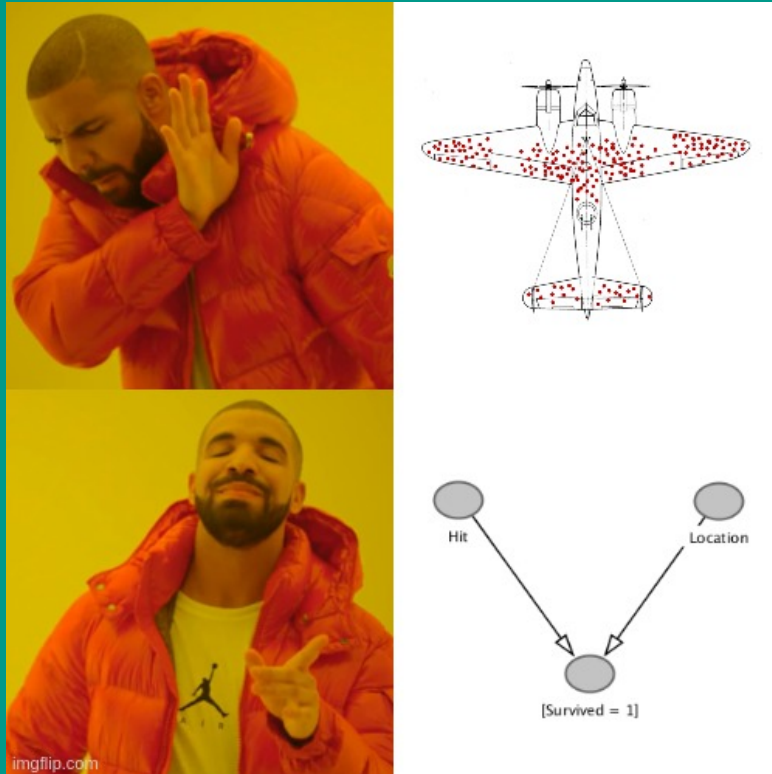
Do *you* agree?

Multivariable observational data



Causality and Directed Acyclic Graphs in Class

Directed acyclic graph (surgery)



Source

- Graphs provide a language to discuss the data generating process.
- Random sampling removes arrows into (S).
- Random allocation (RCT) removes arrows into (X).

If you just woken up

Causality for Data Literacy

- ☛ Causality and directed acyclic graphs may help to develop a framework to think about the data generating process (in a world full of multivariable observational data).

Rebut the "But, ..."

the correctness of the (causal) conclusions is based on the correctness of the graph."



Is (unconscious?) wishful thinking really better?

via GIPHY, inspiration @rlmcelreath

Further reading and contact

- Lübke, K., Gehrke, M., Horst, J. & Szepannek, G. (2020). Why We Should Teach Causal Inference: Examples in Linear Regression with Simulated Data, Journal of Statistics Education.
- learnR Tutorial:
<https://fomshinyapps.shinyapps.io/CausalInference/>
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