# The operationalization of word senses

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# Operationalization

*Operationalization is used to refer to the practice of determining or measuring concepts by means of a »set of operations«*

(cf. Bridgman, 1927)

# Length

*The concept of length is [...] fixed when the operations by which length is measured are fixed: that is, the concept of length involves as much as and nothing more than the set of operations by which length is determined. In general, we mean by any concept nothing more than a set of operations; the concept is synonymous with the corresponding set of operations.*

(cf. Bridgman, 1927, p. 5)

# Multiple operational definitions for the same concept

- one concept can be operationalized in different ways
- Einstein discovered the existence of two operational definitions of "mass"
- General relativity theory relies on mathematically equating these two definitions

# Latent or abstract concepts

- ▶ not directly measurable (such as length)
- ▶ e.g. health, IQ or anger
- ▶ linguistic concepts (syntactic relations, word senses)
- ▶ literary concepts (narrative level, tension)
- ▶ operationalization here helps to measure unobservable concepts by measuring some effects they are assumed to have

# Operationalization in DH

- operationalization of abstract (often literary or linguistic) concepts is a major concern in DH (Pichler & Reiter, 2022)
- deals with very abstract concepts and tries to make them measurable
- "operationalization can both contribute to the definitional refining of (humanities') concepts, and facilitate opportunities for their empirical examination"[1]

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[1]Workshop description "Measuring Meanings - Computing Concepts. Practices of Operationalization and their Implications for Text Studies".https://www.hsozkult.de/event/id/event-134130

# Operationalization of word meaning

- ▶ word meaning (often senses) are an abstract and latent concept from lexical semantics
- ▶ there are different operationalizations:
    - ▶ lexicographic approach
    - ▶ traditional sense definition annotation
    - ▶ annotation with lexical substitutes
    - ▶ use pair annotation with semantic proximity

# Quality criteria

- objectivity
- reliability
- validity
- robustness
- . . .

# Goal

- Provide a systematic review of word sense measurement procedures according to the quality criteria for operationalization applied in related fields such as psychology/psychometrics.

# References I

Bridgman, P. W. (1927). *The logic of modern physics*. Macmillan.

Pichler, A., & Reiter, N. (2022, 12 12). From concepts to texts and back: Operationalization as a core activity of digital humanities. *Journal of Cultural Analytics*, *7*(4). doi: 10.22148/001c.57195