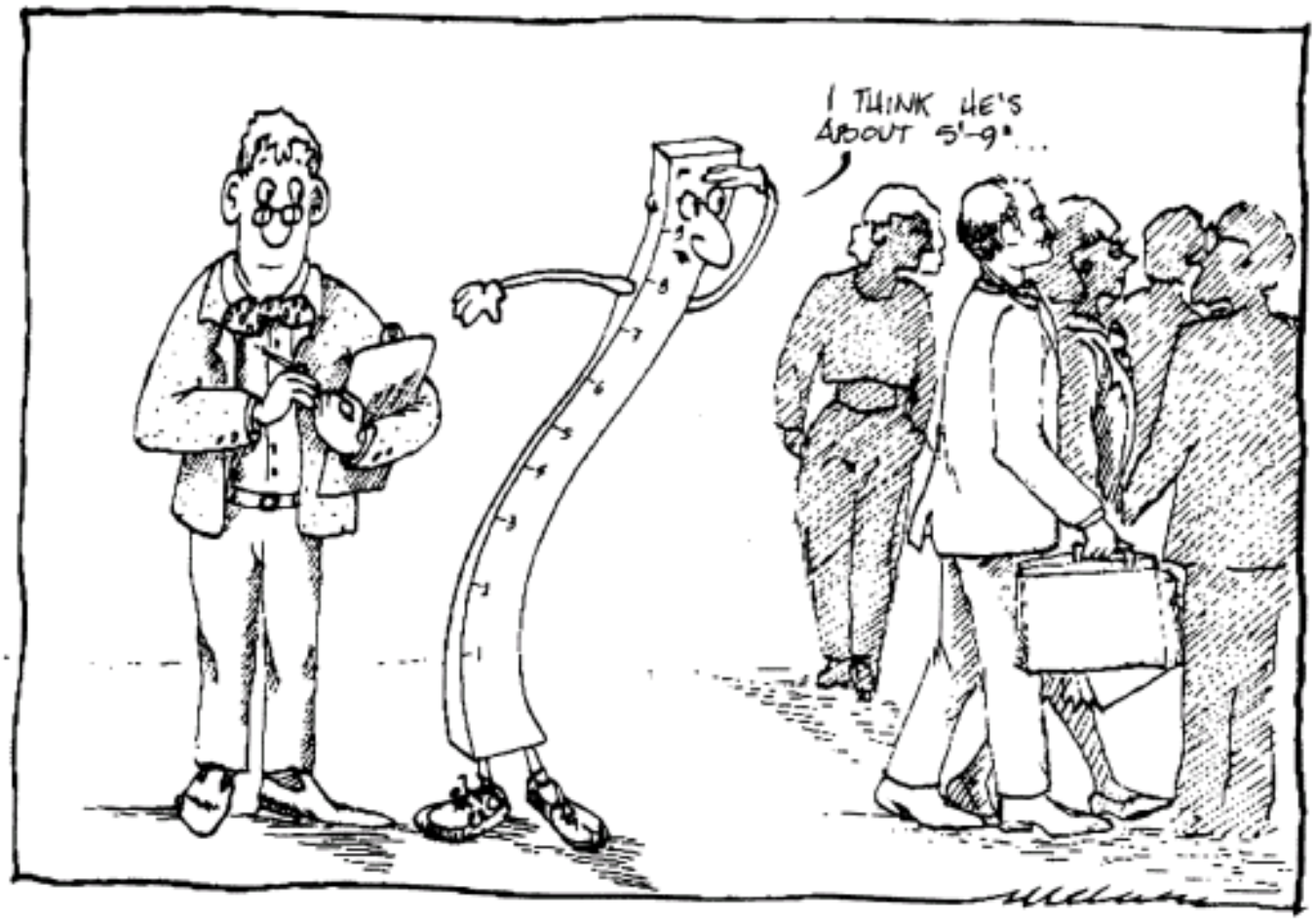
UNIVERSITY OF OXFORD

Measurement 1

http://users.ox.ac.uk/~sfos0015


I THINK HE'S ABOUT 5'-9"...

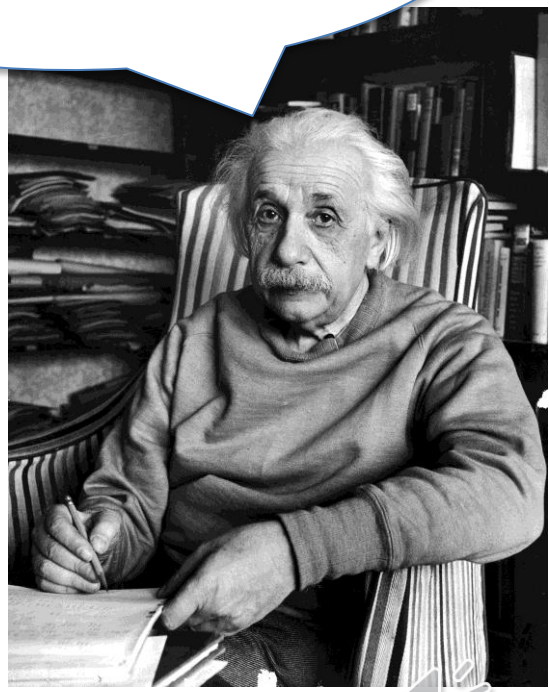
1. Conceptualisation
2. Measurement
3. Validity and reliability
4. Measurement error

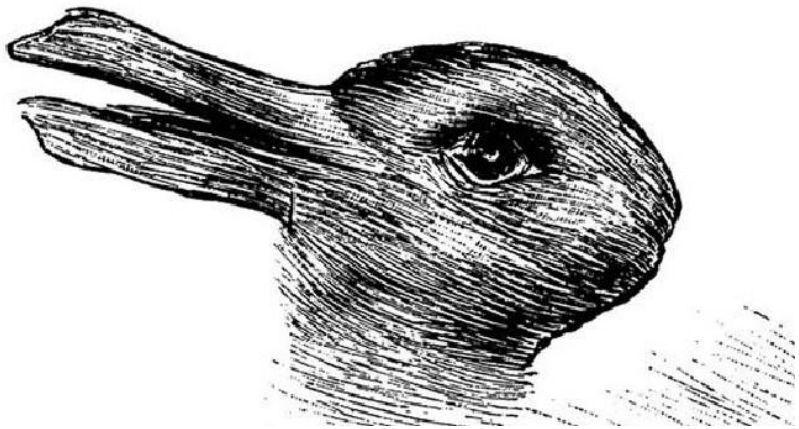
Concepts without percepts are empty…percepts without concepts are blind.

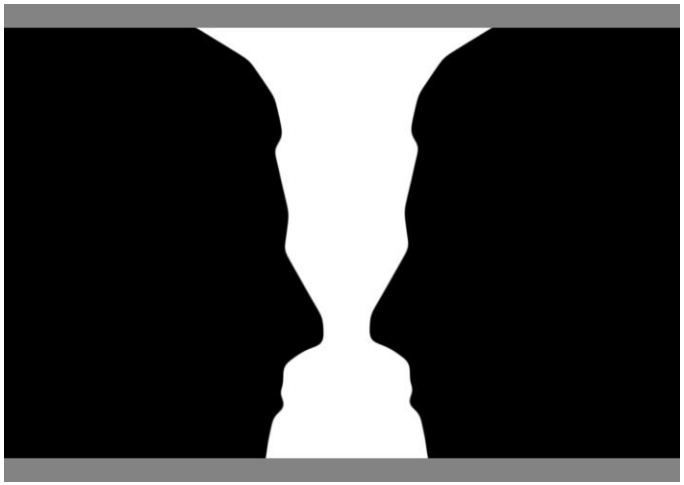
Immanuel Kant (1724-1804)

I don't try to imagine a personal God; it suffices to stand in awe at the structure of the world, insofar as it allows our inadequate senses to appreciate it.

Albert Einstein (1879 -1955)







Aristarchos of Samos evolved around 280-265 BC the heliocentric theory of the universe. The reason that he did not cause a scientific revolution 1700 years before Copernicus is that he could not support his theory with sufficiently precise observations and measurement.

A. R. Burns. The Penguin History of Greece

Αρίσταρχος (310 BC - 230 BC)

The social scientist finds himself in continuous effort to combine two ideals: vision and precision. Clearly, he needs precise instruments if he wants to develop testable propositions. But the social world is very complex and doesn't provide us with the well delineated objects from which the natural sciences start. Thus, he also needs a great deal of creative imagination - of vision - to decide on the objects about which such propositions should be developed.

Paul Lazarsfeld (1965) foreword to *Constructive Typology and Social Theory*

Concepts

1. Concepts are abstractions, they can, though needn't be, expressions of ideas that exist in everyday discourse, where usage may be relatively imprecise.

2. By their nature concepts are **unobservable**. They are 'in the head'.

3. They are of use because:

    1. They help to organise experience.
    2. They help to communicate it to others.
    3. They help to explain experience.

Examples of concepts

Social capital

Solidarity

Bureaucracy

Market

Post materialism

Family

Household

Operationalization

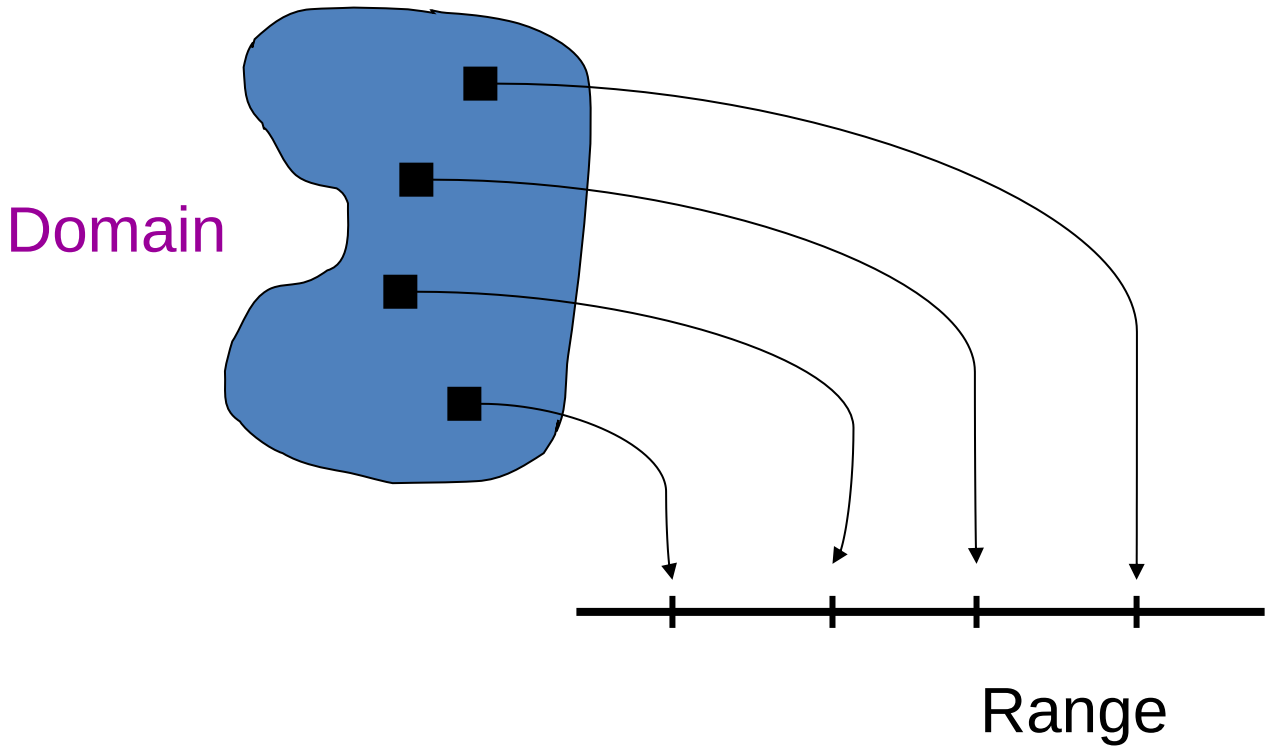
1. Conceptualisation
    1. Process of identifying and clarifying concepts.
2. Operationalization
    1. Specifying observable phenomena (**indicators**) that indicate:
        1. Presence or absence.
        2. Strength or weakness.

    2. Specifying **instruments** to **measure** the indicators.

Measurement

...assignment of numbers to objects or events according to rules.

S. S. Stevens

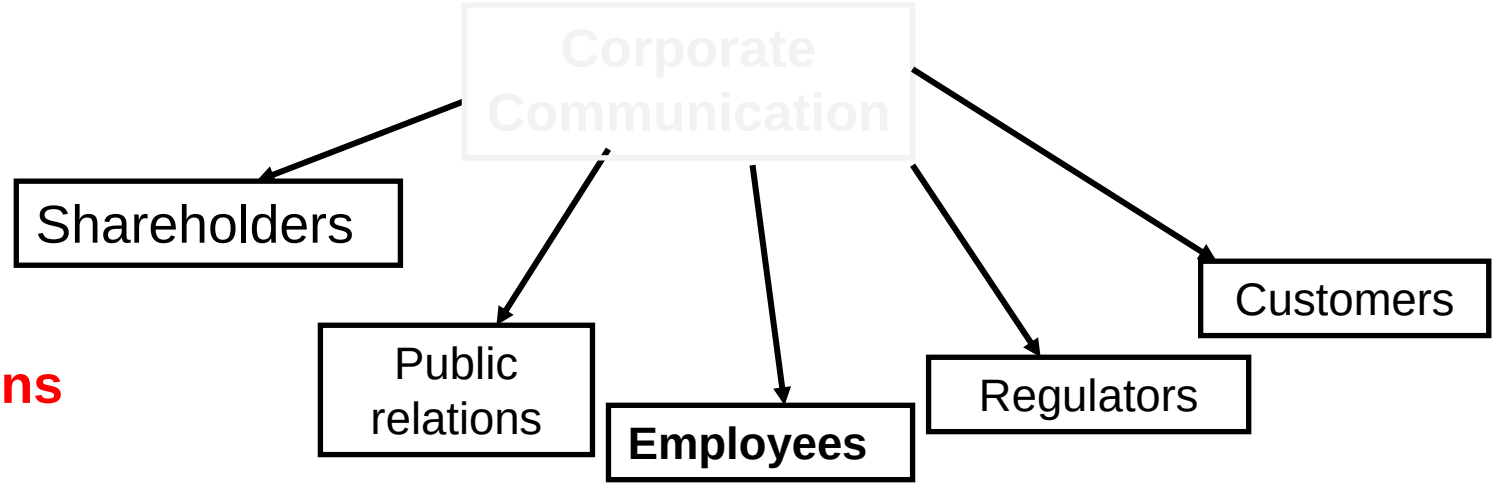


Classification

Concept

Corporate Communication

Concept

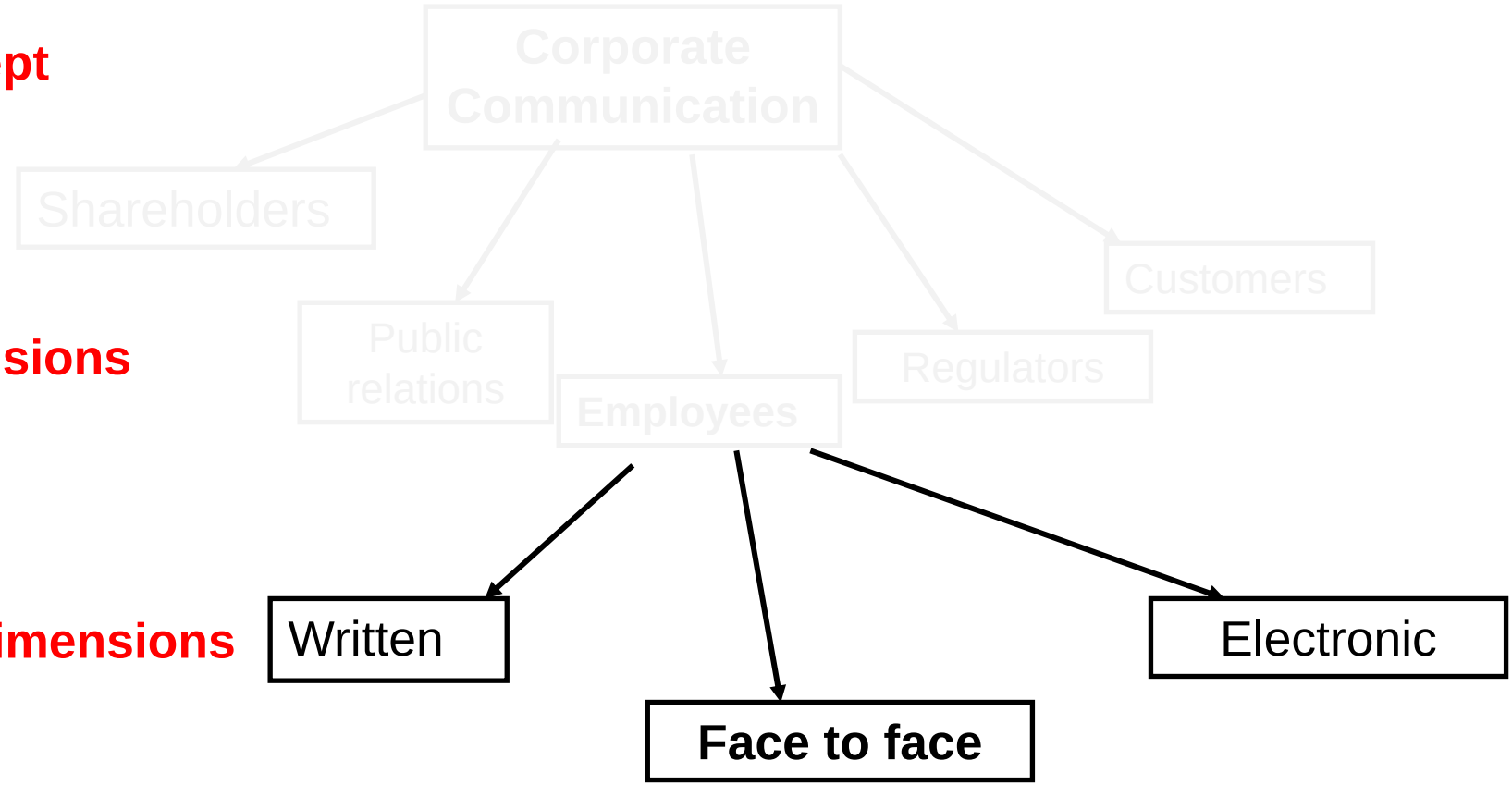


Dimensions

Concept

Dimensions

Sub-dimensions

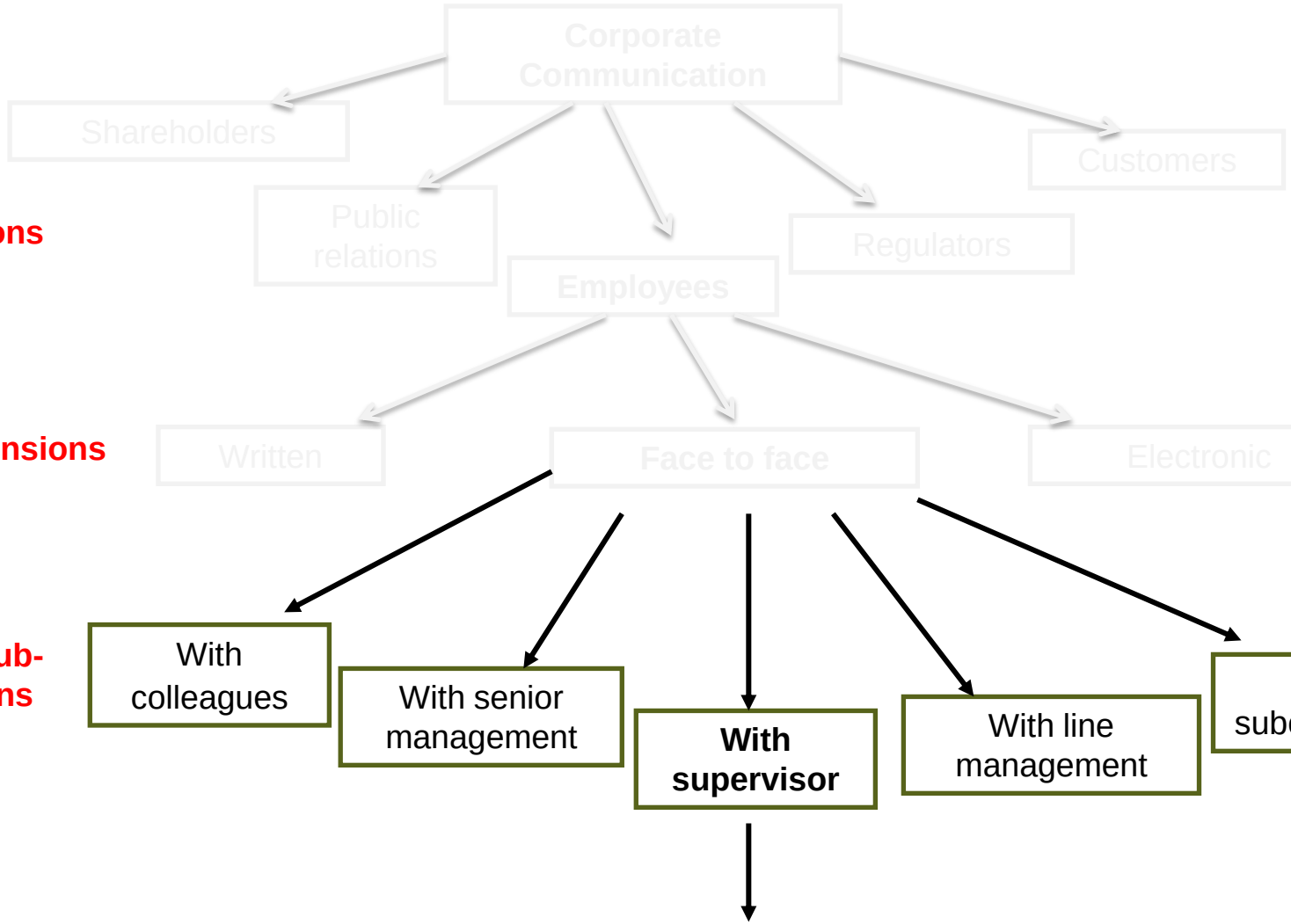


Concept

Dimensions

Sub-dimensions

Further sub-dimensions



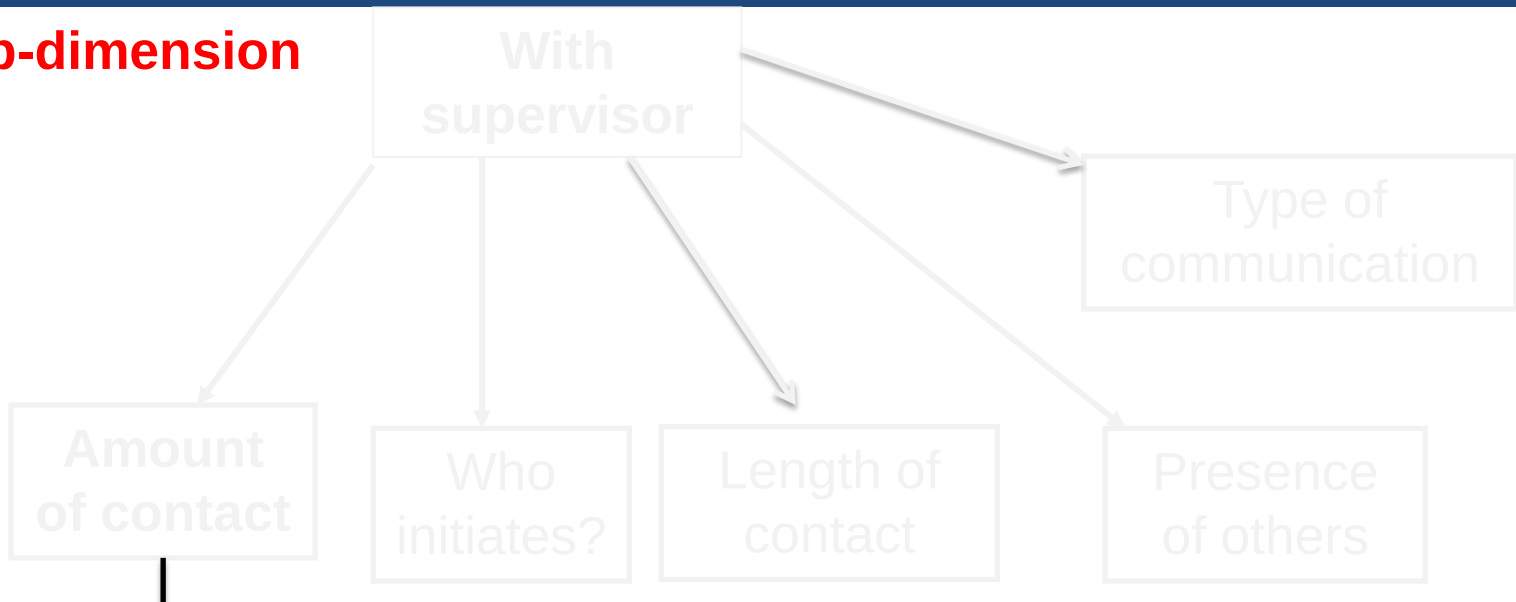
Further sub-dimension

With supervisor

- Type of communication
- Amount of contact
- Who initiates?
- Length of contact
- Presence of others

Indicators

Further sub-dimension



Indicators

Survey question

In the past 7 days how many times have you had a face-to face conversation with your supervisor?

- ❑ Never
- ❑ A few times in the week
- ❑ About once a day
- ❑ Several times a day
- ❑ Don't have a supervisor

Validity and reliability

1. Validity
    1. Does the measure accurately reflect the concept it is meant to measure?
2. Reliability
    1. Does a particular measure, applied to the same object, yield the same result each time?
3. Validity presumes reliability.
4. Reliability does not presume validity.

How to evaluate reliability

1. Test-retest method.
    1. Consistency of repeated measurements on same subjects (possibly by different observers).
    2. Problems:
        1. Reality may change.
        2. Subjects react to the testing process.
        3. Memory.

How to evaluate reliability

1. Inter-item reliability
    1. Use in parallel more than one indicator of the same construct (Union Militancy).
        1. I am opposed to strike action under any circumstances.
        2. I could not vote for strike action regardless of the facts and circumstances of the case.
    2. If certain assumptions are met…
        1. Reliability can be measured as the correlation between the responses to two items.
        2. If there are more items reliability can be measured as a function of the average inter-item correlation.

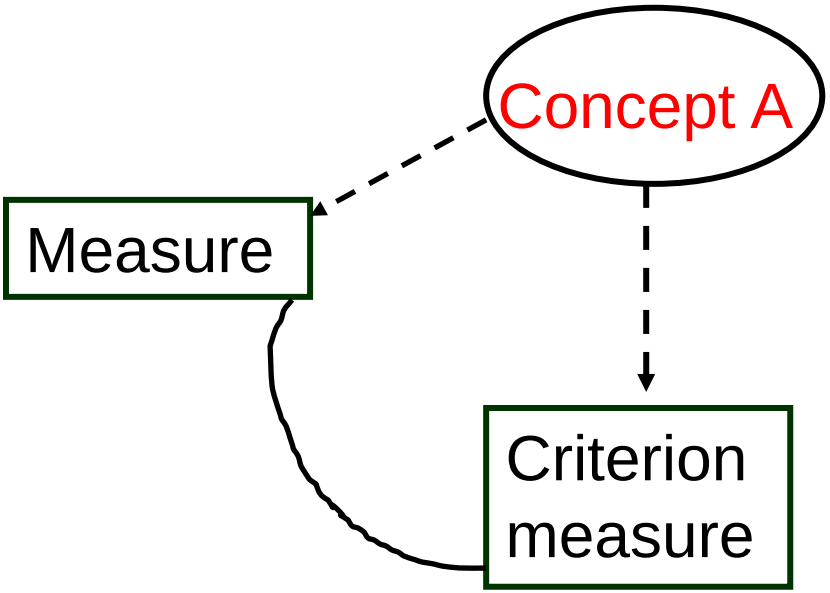
Types/tests of validity

1. **Subjective Validation**
    1. Face validity, Content validity.
2. **Criterion-related Validation**

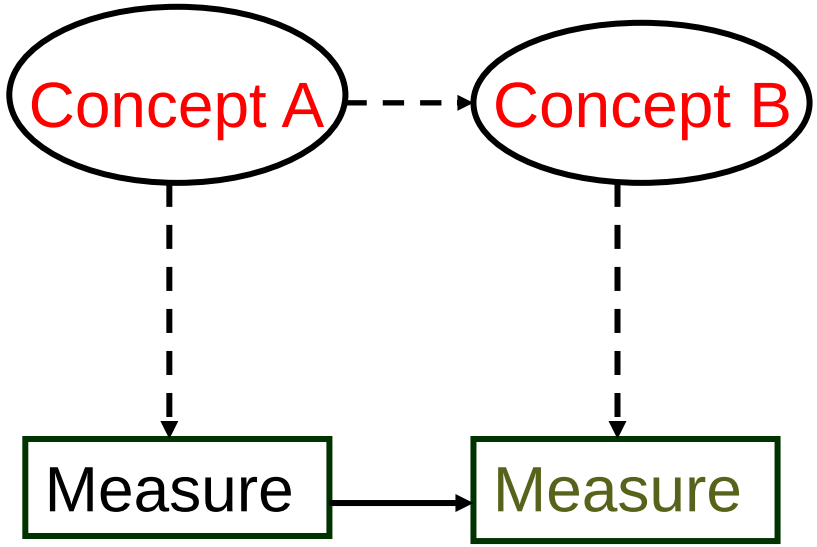
3. **Construct validity**

Types/Tests of Validity

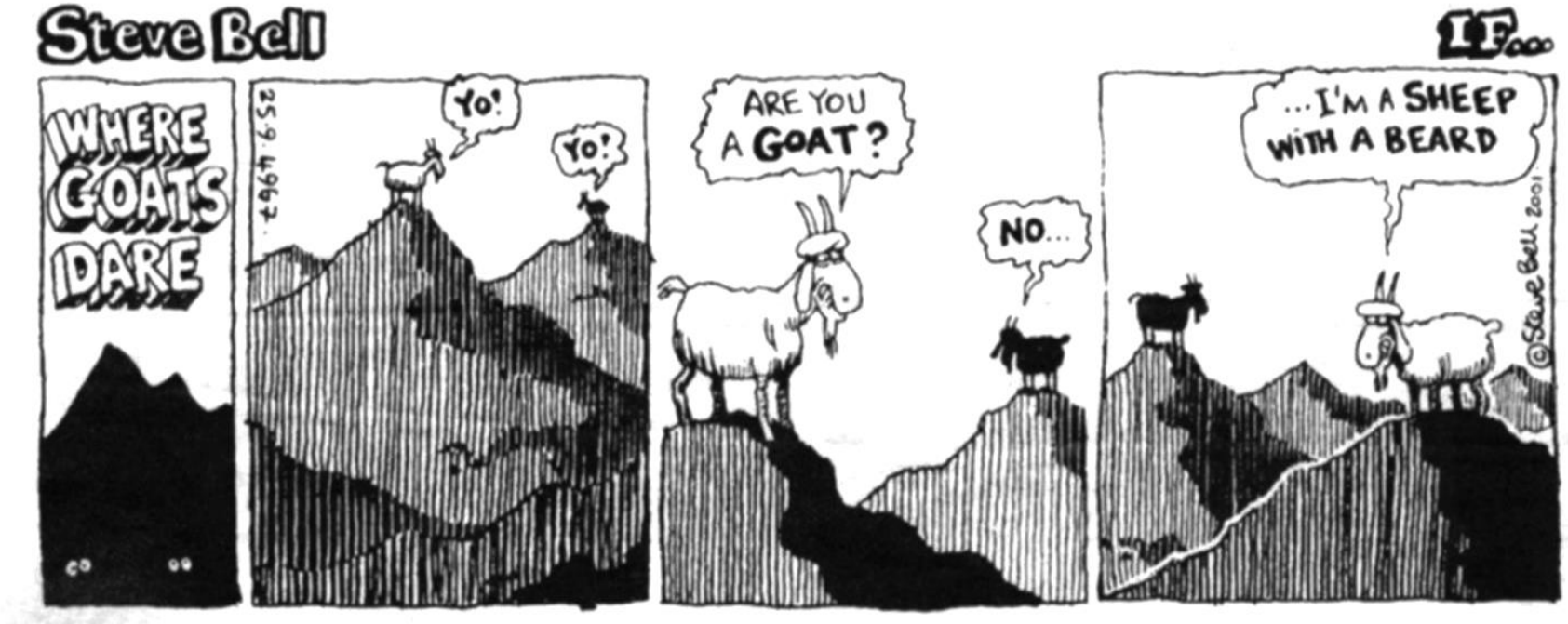
Criterion-related Validity



Construct Validity



Measurement error



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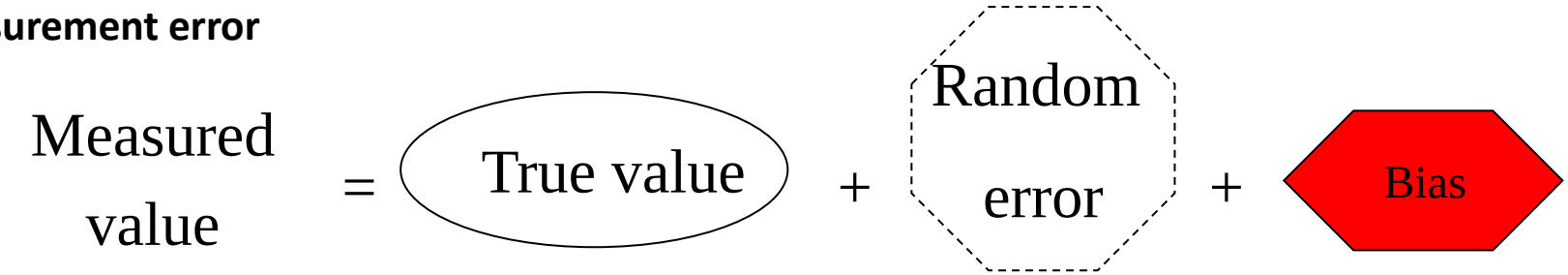

Measured value	what you see or record
True value	true underlying state of affairs
Random error	response errors that are as likely to be big/small + as big/small –
Bias	things measured unintentionally - response sets, yea saying - desirability bias - memory effects