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## Evaluation of Quality of Inquiries Instrument for Pre-university Science Students

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# ARV card

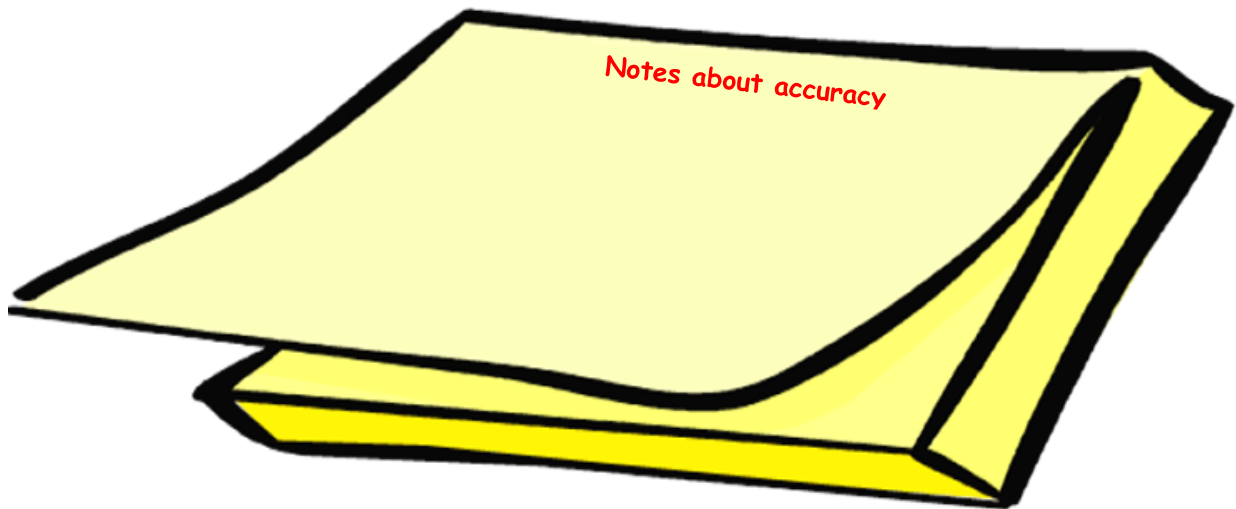
to ensure the accuracy, reliability and validity of an inquiry

## Accuracy

...is influenced by the performance of **measurements** and **observations**.

Measurements of an inquiry are **accurate** enough when....

- ...the measurements / observations are done with **several, independent observers**, who speak in advance about the inquiry method.
- ...the measurements / observations are done in an **objective way**.
- ...the measurements / observations are done in a **systematic way**.
- ...the measuring instruments have an **adequate measuring range** (between the **minimum and maximum expected measuring rates**).
- ...the measuring instruments are **precise enough** for the inquiry.
- ...the measuring instruments are **calibrated** or **set to zero** before each measurement.

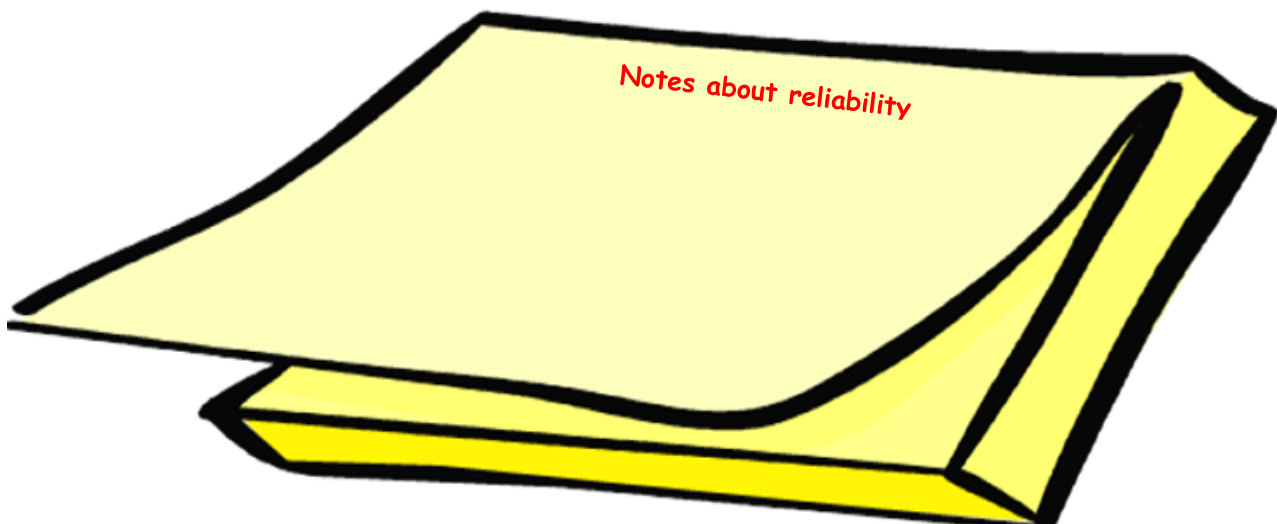


## Reliability

...is influenced by the **repeatability** and **reproducibility** of the **results** of an inquiry.

Results of an inquiry are **reliable** enough when....

- ...the **influence of other variables** is minimal
- ...a **control experiment** is performed to determine any influence of other variables.
- ...the results are comparable when the **measurements or observations** are **repeated**.
- ...the **test sample** is **large enough**.
- ...the test sample is **sufficiently varied** to be a faithful reflection of the research population.
- ...**another inquiry method** or **performance by another researcher** yields similar results.



# Validity

...increases when **different parts** of an inquiry are **coherent**.

An inquiry has good **validity** when....

- ...the **same independent** and the **same dependent variable** is used in each part of an inquiry
- ...the **inquiry question** is **univocal** and **defined**.
- ...the **hypothesis can be tested**.
- ...the **inquiry method serves** to answer the inquiry question and/or to test the hypothesis.
- ...the researcher has **sufficient appropriate results** to draw a conclusion.
- ...the **conclusion is based on** the results of the performed inquiry.
- ...the **inquiry question** is answered **completely** in the conclusion.



Notes about validity



Other notes

**Colophon**

This ARV card is initially written in Dutch and has been translated into English for publication purposes.

ARV CARD: TO ENSURE THE ACCURACY, RELIABILITY AND VALIDITY was developed during the PhD study by Saskia van der Jagt on *Learning to inquire in the science subjects at pre-university level*. This memo sheet is a component of the Evaluating the Quality of Inquiries (EQI) instrument. The other two components are a checklist and a set of rubrics. The EQI instrument can be used with the accompanying learning materials (general science inquiry unit, biology inquiry unit and physics inquiry unit).

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