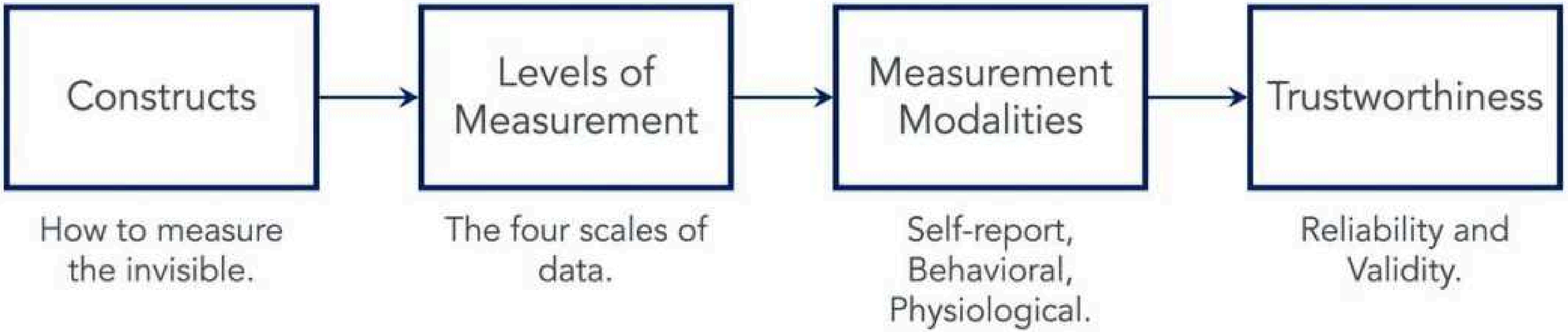
2.1

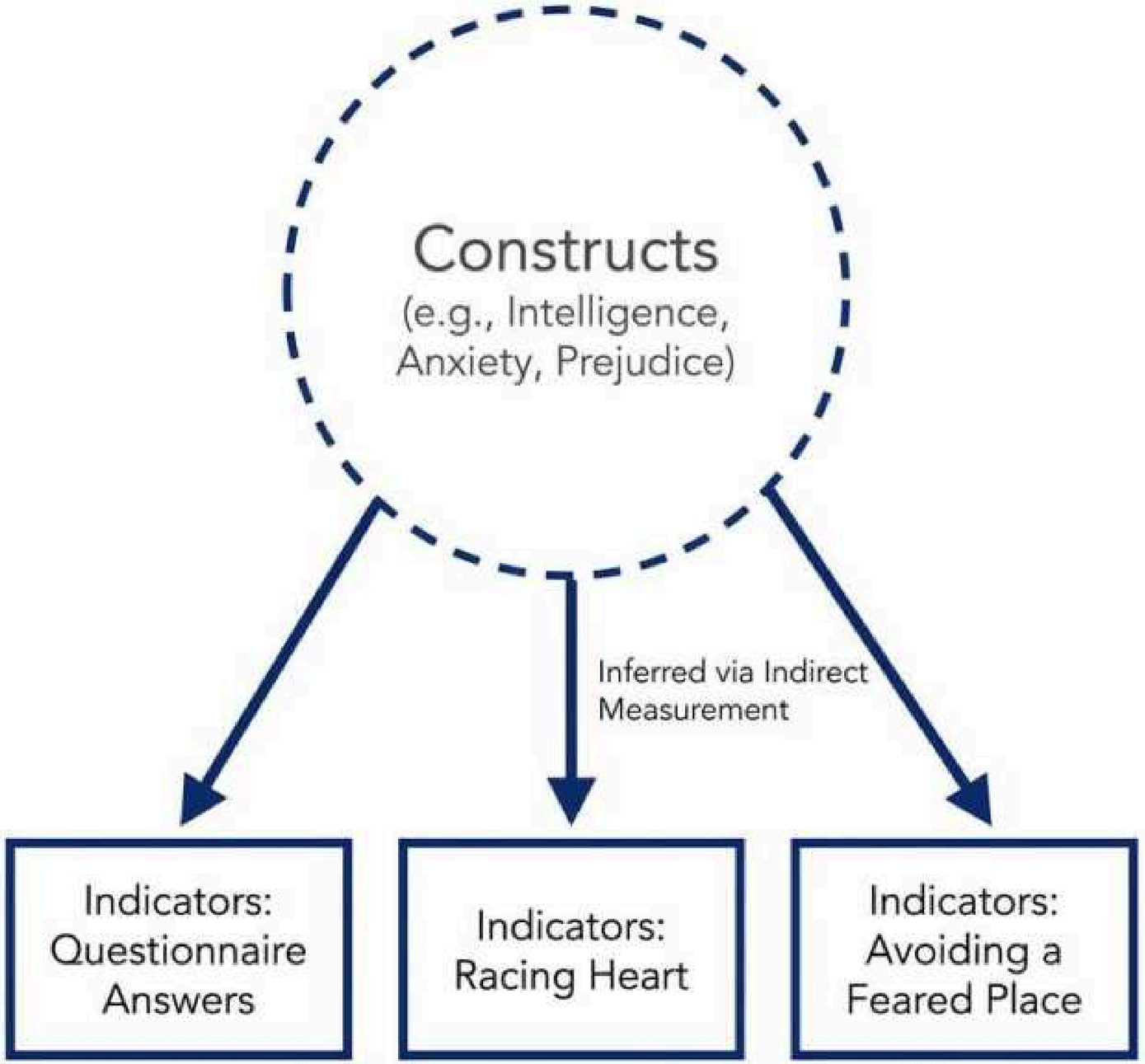


Psychology's central difficulty is measuring what cannot be seen directly.

Gemini Notebook

2.2

Because no one can point to anxiety on a table, quality of psychological measurement is critical.



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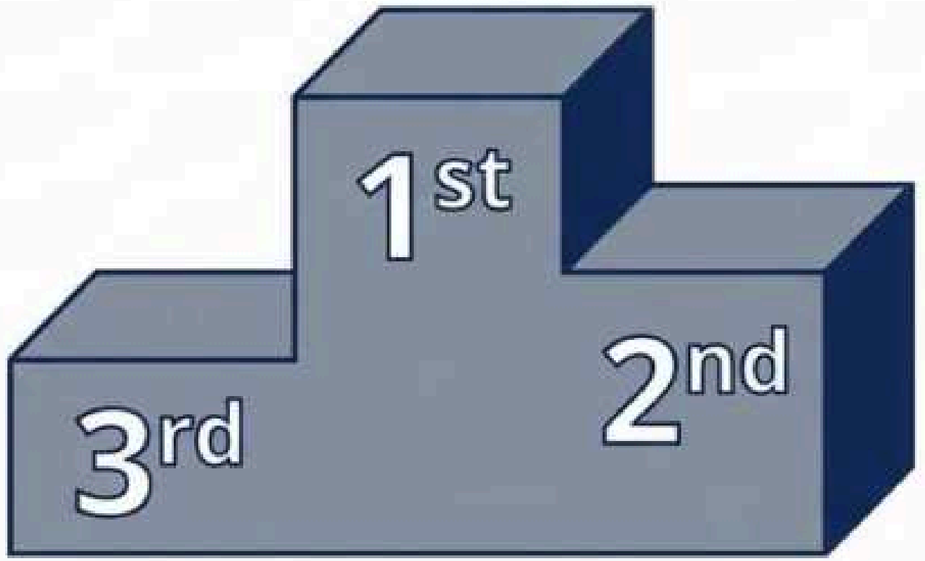
2.3

Nominal



Sorts into categories with no intrinsic order.

Ordinal

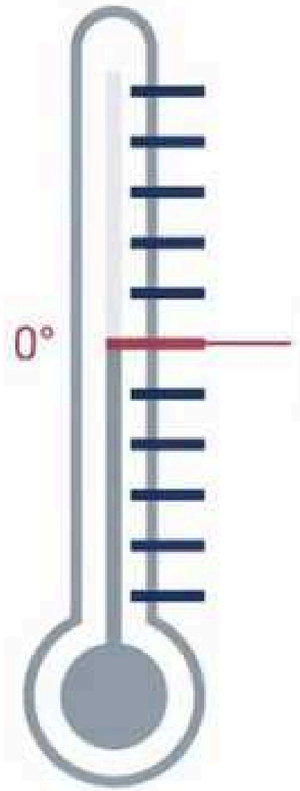


Ranks cases but distances between ranks are unknown.

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2.4

Interval



Arbitrary Zero
(0° does not mean
“no temperature“)

Ratio



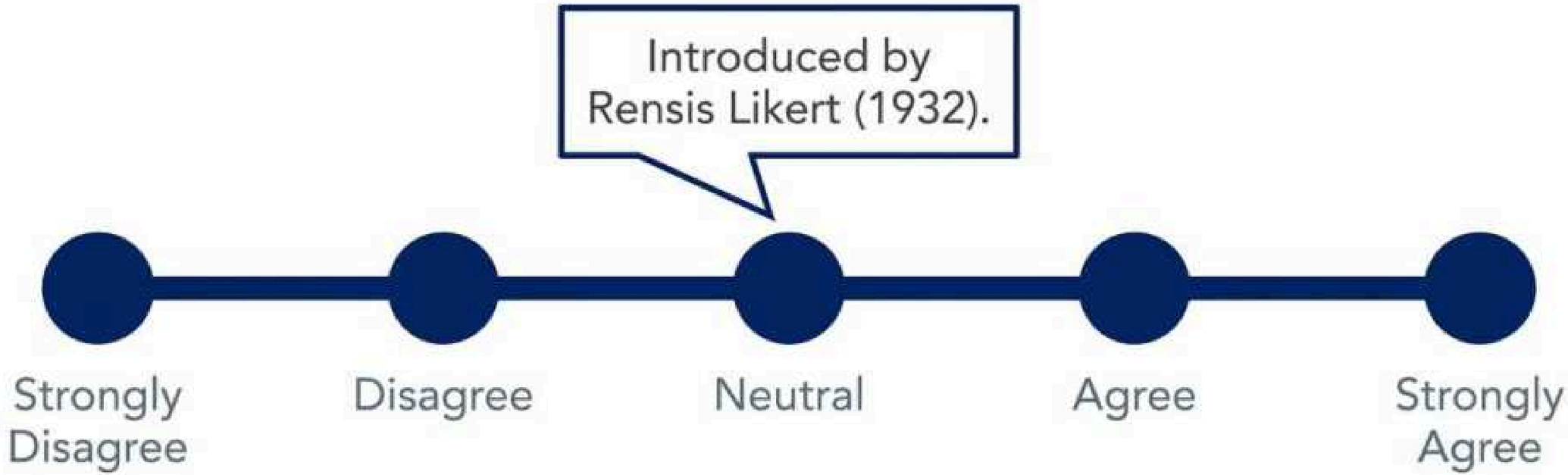
Absolute Zero

- Reaction time
- Number of correct items

Only ratio measures allow proportional statements (e.g., ‘Score A is twice Score B’).

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2.5

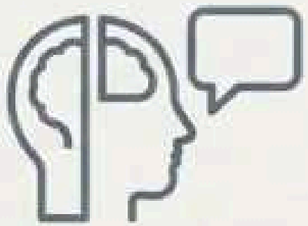


Advantages of Self-Report

- Low Cost (Cheap to administer)
- Direct Access (Reveals internal thoughts and feelings invisible to observers)

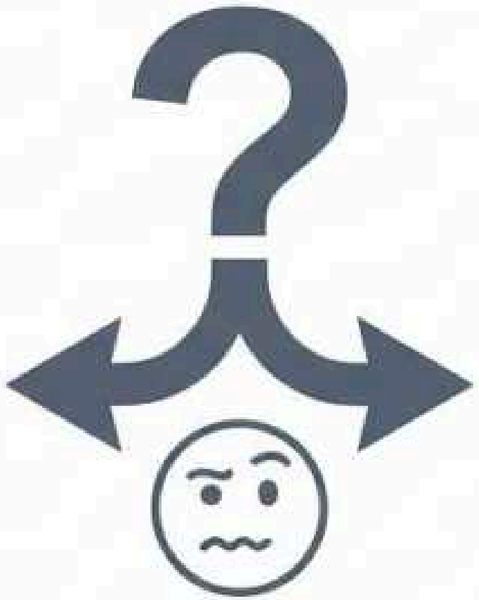
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2.6

	**Social Desirability**	Giving the answer that looks good.
	**Acquiescence**	The tendency to agree with every statement.
	**Lack of Introspection**	Nisbett & Wilson (1977): We know our answers, but cannot accurately report our underlying reasons.

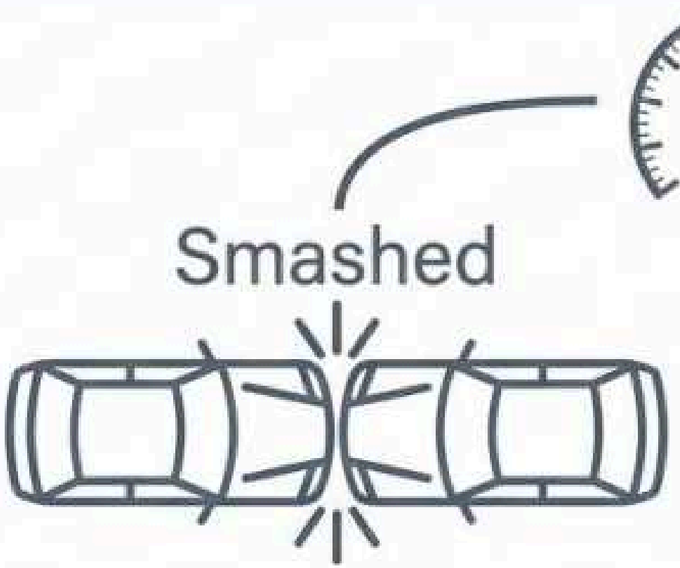
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2.7

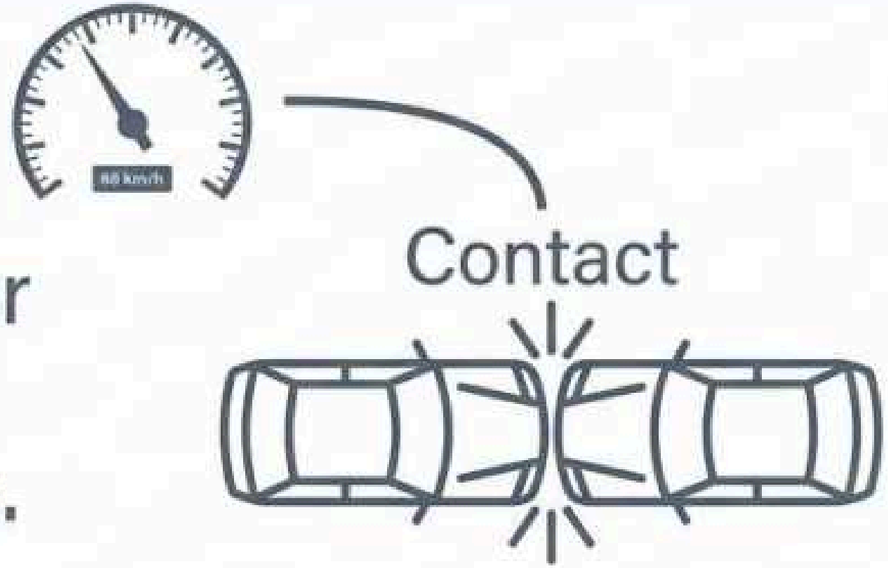


Double-Barreled: Asking two things at once makes a ‘Yes’ impossible to interpret.

Leading Questions push people toward a reply.

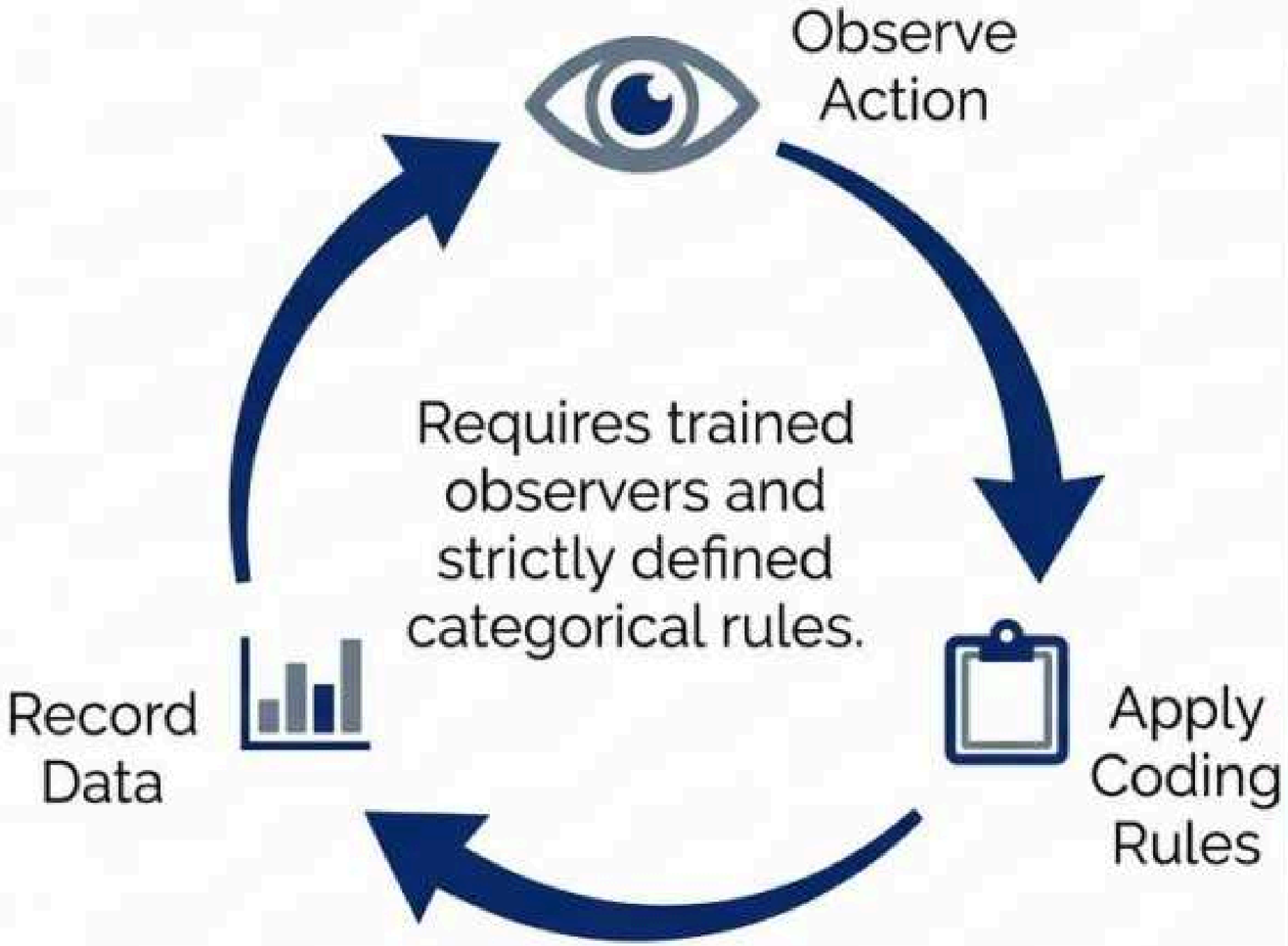


Verbs alter memory estimates.



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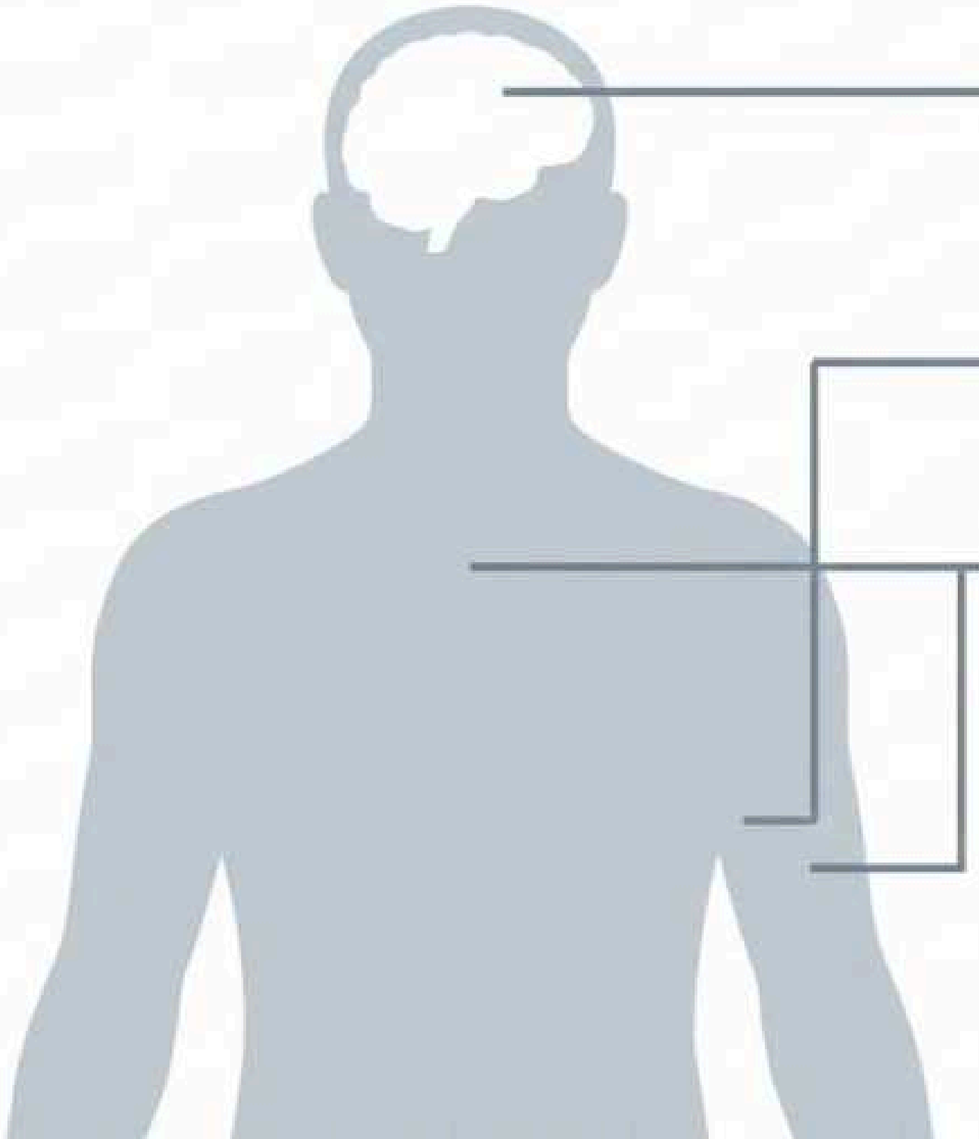
2.8



Pros	Cons
Harder to fake than opinions.	High effort/cost to collect; single behaviors can have multiple explanations.

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2.9



EEG (Brain waves) & Scanners
(Activity location, not thoughts)

Heart Rate

Cortisol (Hormones) & Sweating

THE INDIRECTNESS LIMITATION: Objective and precise, but highly ambiguous. A **fast heartbeat equals fear...** or just walking up a flight of stairs.

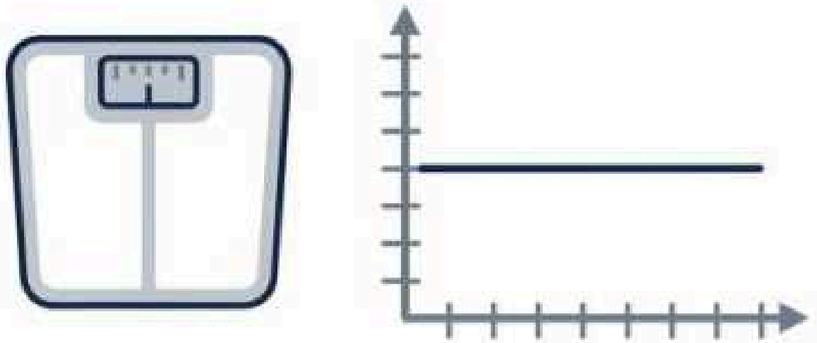
Must be used in tandem with reports and behavior.

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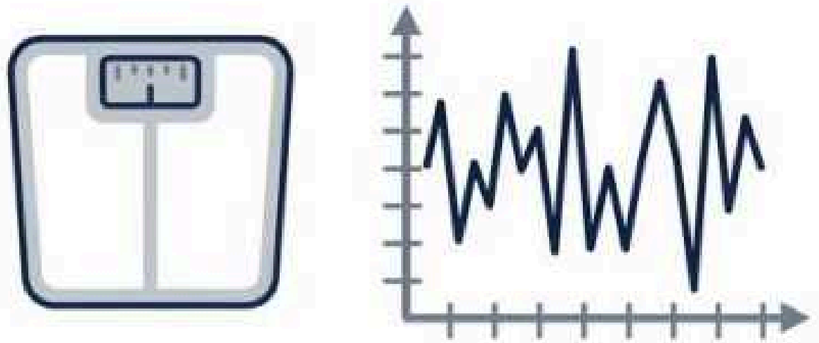
2.10

$$Observed\ Score = True\ Score + Random\ Noise$$

Reliable



Unreliable



Reliability = Consistency. How much of the score is stable versus how much is random noise.

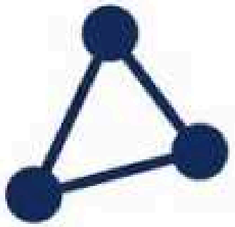
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2.11



Test-Retest

Do the same people score similarly on two separate occasions?



Internal Consistency

Do items within the measure agree with each other? Measured via Cronbach's alpha (Acceptable threshold: $\alpha \geq 0.70$).



Interrater

Do two independent observers coding the same behavior agree?

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2.12



Reliable, but NOT Valid
(Consistent but Wrong)

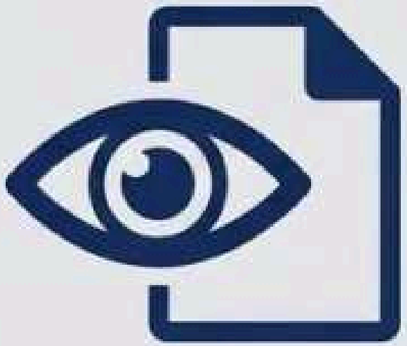


Reliable AND Valid
(Consistent and Accurate)

Reliability is necessary but not sufficient. Example: Measuring head size is a highly reliable procedure, but entirely invalid for measuring intelligence.

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2.13



Face Validity

Does the measure look like it assesses the right thing?



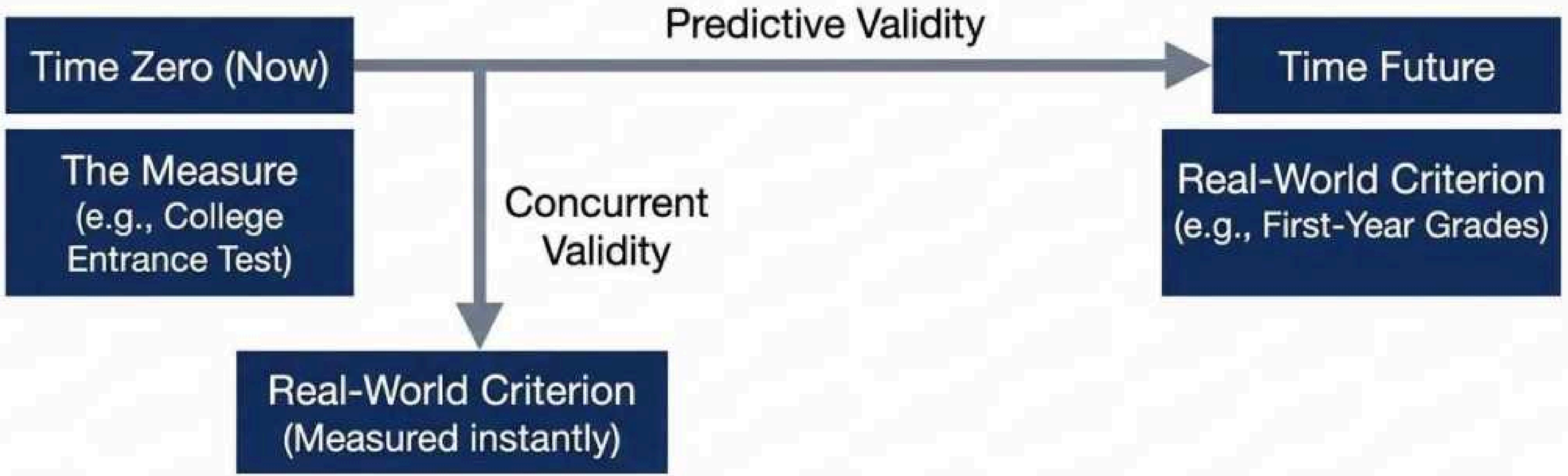
Content Validity

Does the measure cover the entire range of the construct? (e.g., A math test cannot only measure addition; it must include subtraction, etc.).

These are useful starting points, but looking right is not proof of working right.

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2.14

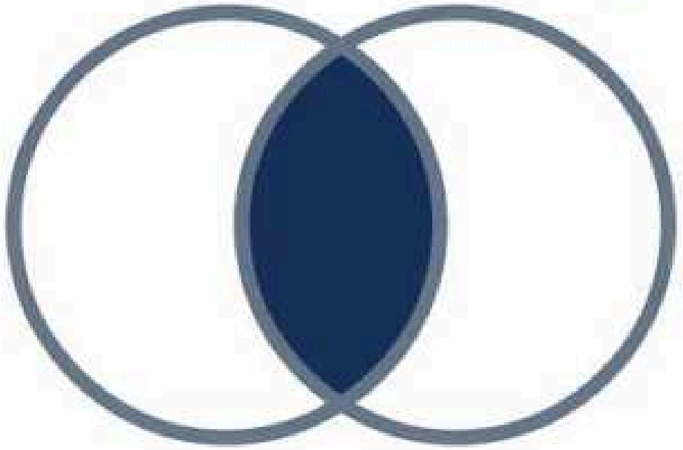


Correlation with real-world outcomes provides the empirical evidence for criterion validity.

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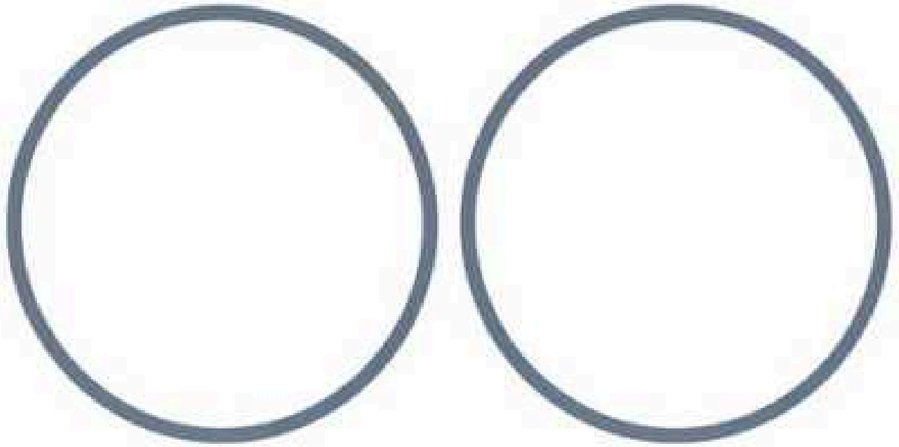
2.15

Convergent Validity



Must agree with other measures of the same theory.

Discriminant Validity

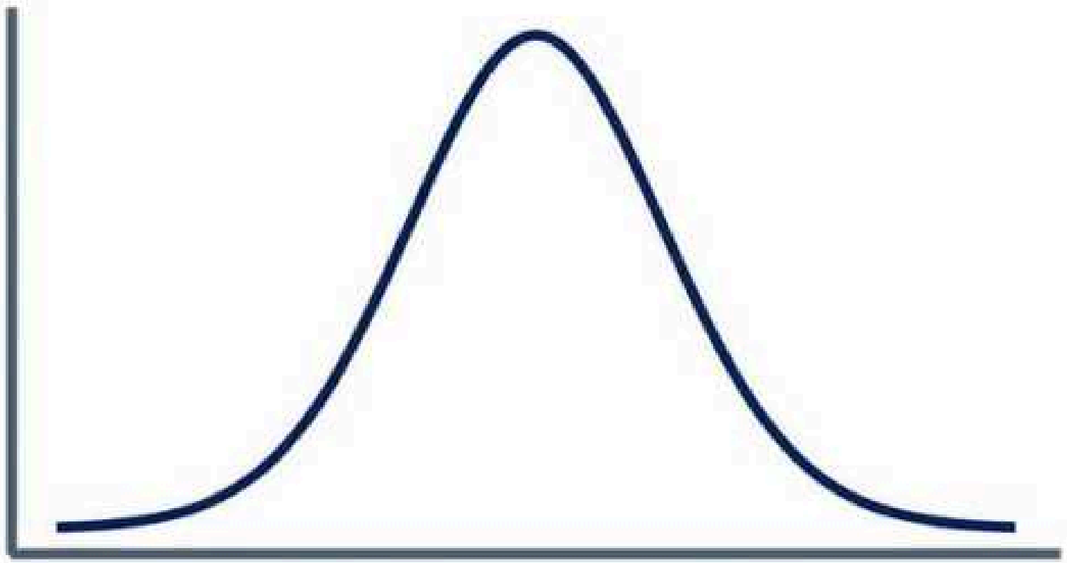


Must NOT agree with measures of different constructs.

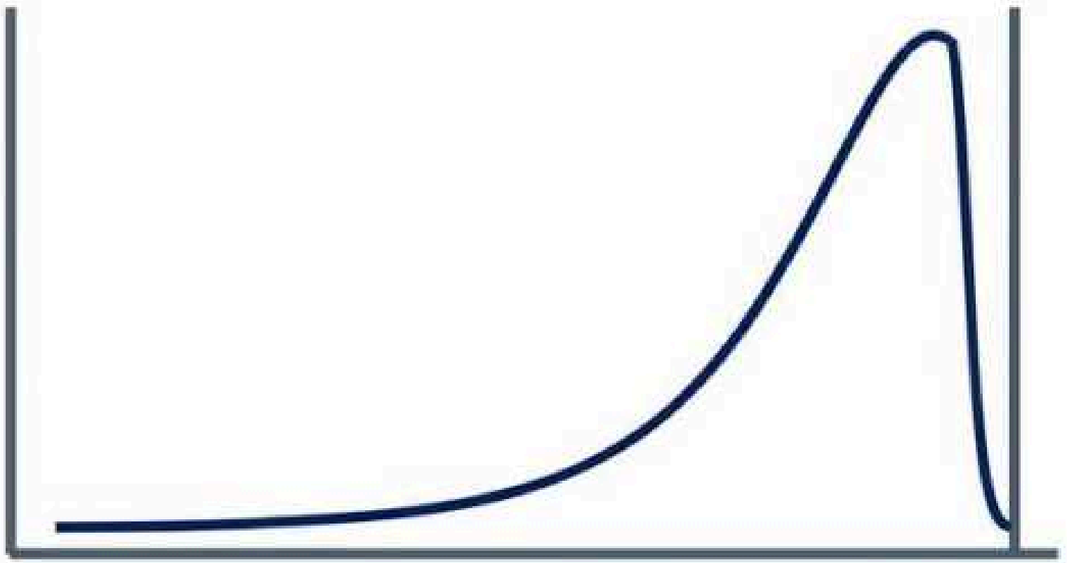
Construct validity is the broadest form of evidence. It takes many studies and is never completely finished.

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2.16



Random errors tend to cancel out when we average many observations (why tests have many items, not just one).



Ceiling Effect: When a task is too easy, everyone scores at the top, hiding real differences.

No measure is perfect. Researchers must estimate error so readers know the true precision of a score.

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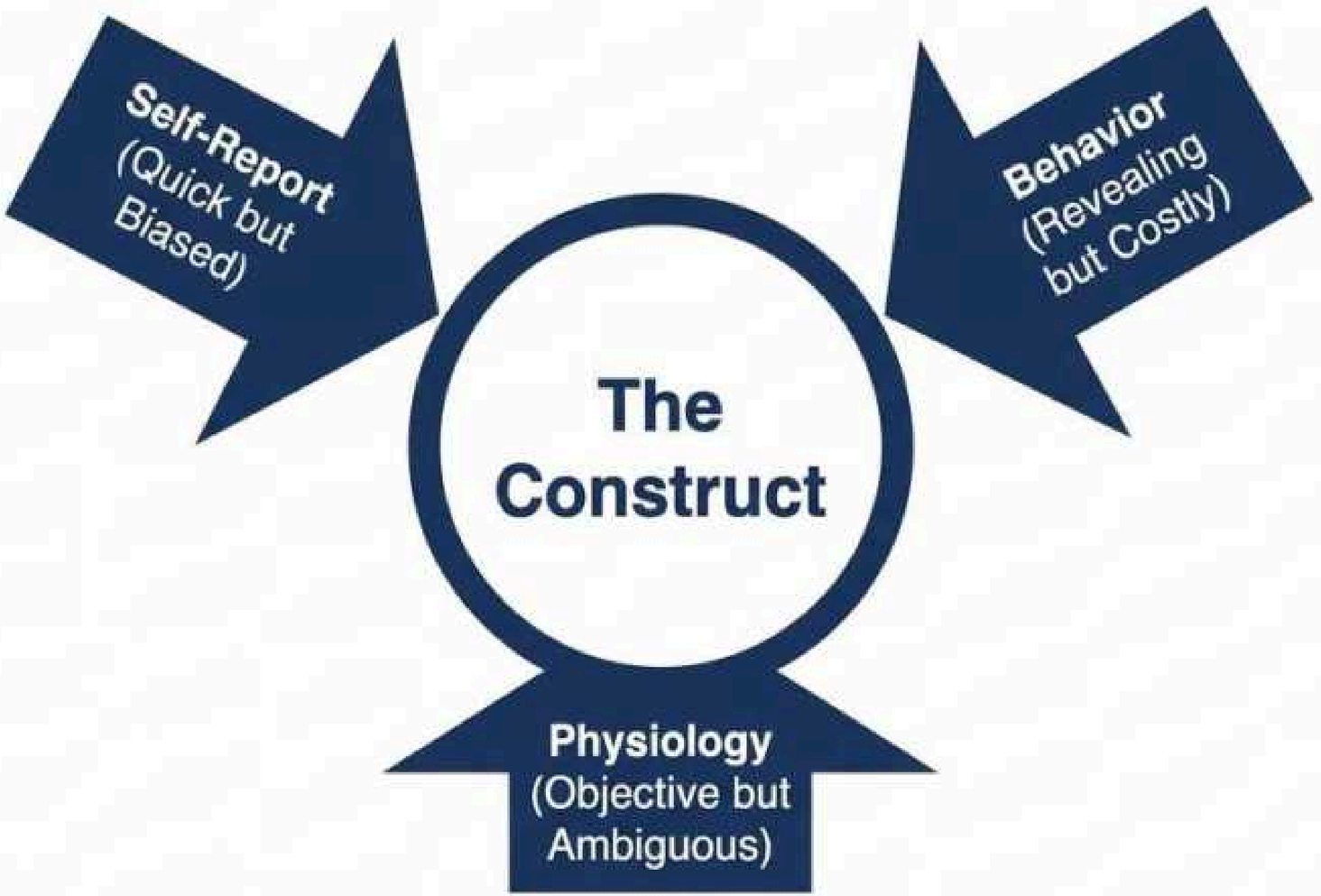
2.17



A fair test must be fair to everyone. Researchers must prove reliability and validity specifically for the group they are studying.

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2.18



Converging Operations: Because choosing a measure involves trade-offs, researchers use multiple modalities. If different measures agree, confidence in the result exponentially increases.

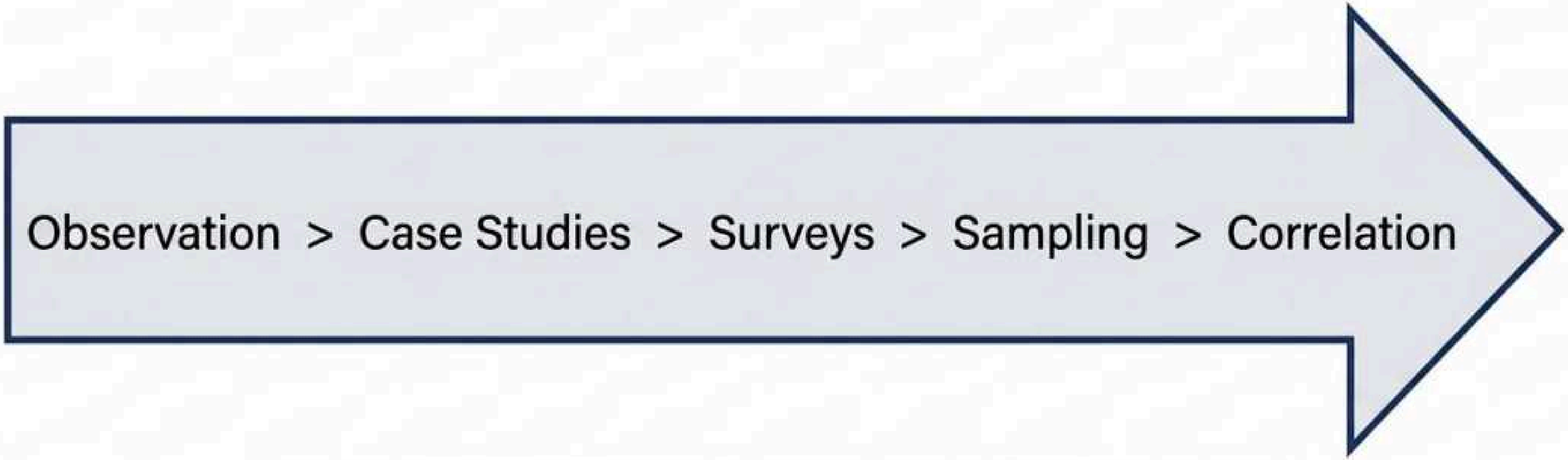
Gemini Notebook

2.19

1	**Inference & Scales** Psychologists infer constructs from indicators, mapping them to nominal, ordinal, interval, or ratio levels.
2	**Trade-offs in Modality** Self-report, behavioral, and physiological measures each carry distinct strengths and inherent weaknesses, necessitating combined use.
3	**Trustworthiness** A reliable measure is consistent; a valid measure is accurate. Validity requires multiple converging layers of evidence.

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2.20



CRITICAL PREVIEW WARNING:
Correlation ≠ Causation.

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