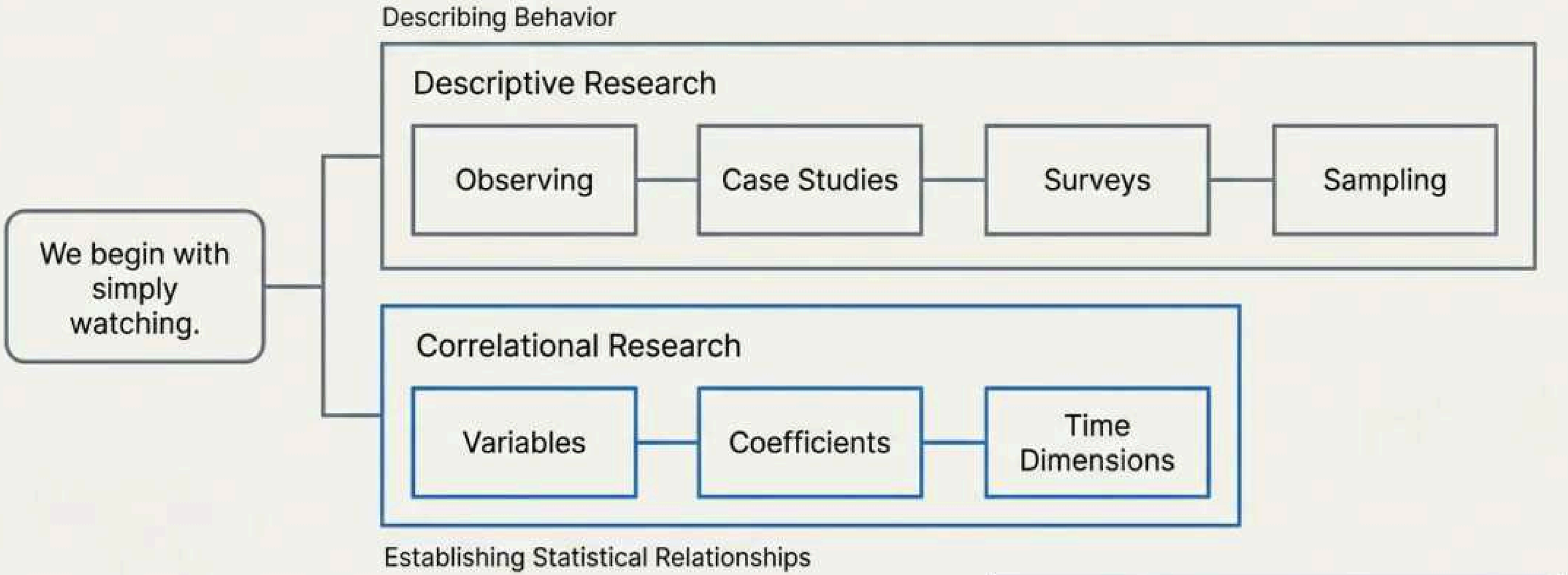
3.1



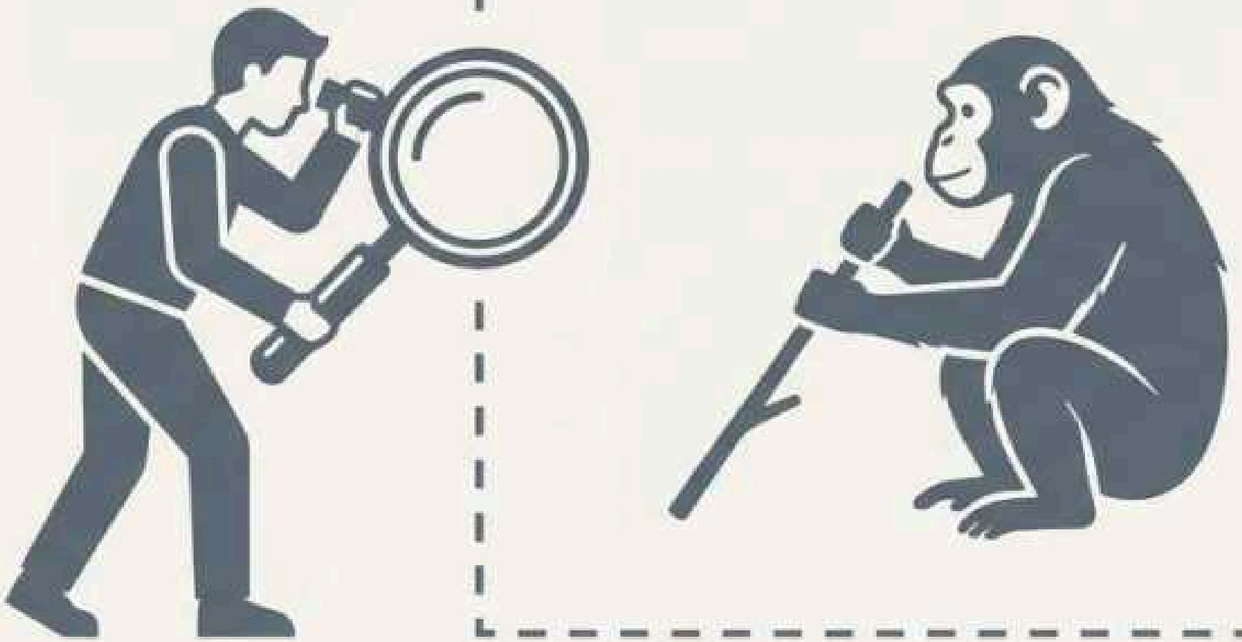
Exploring the most widely misread idea in all of psychology: Correlation.

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3.2

Method

Naturalistic Observation.
Aim is to describe what is happening without intervention.



Historical Benchmark

A prominent 1960 field study demonstrating primate tool use.

Key Strength

Realism. Behavior remains undisturbed by artificial laboratory constraints.

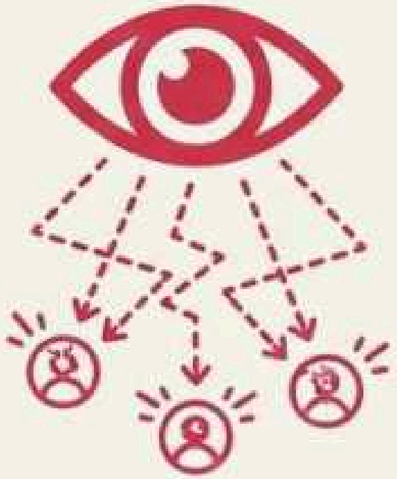
Requirement

Researchers must use clear, standardized categories so multiple observers record the same events identically.

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3.3

The Danger



Vulnerability: Reactivity. Subjects alter behavior when they know they are being watched.

The Solution



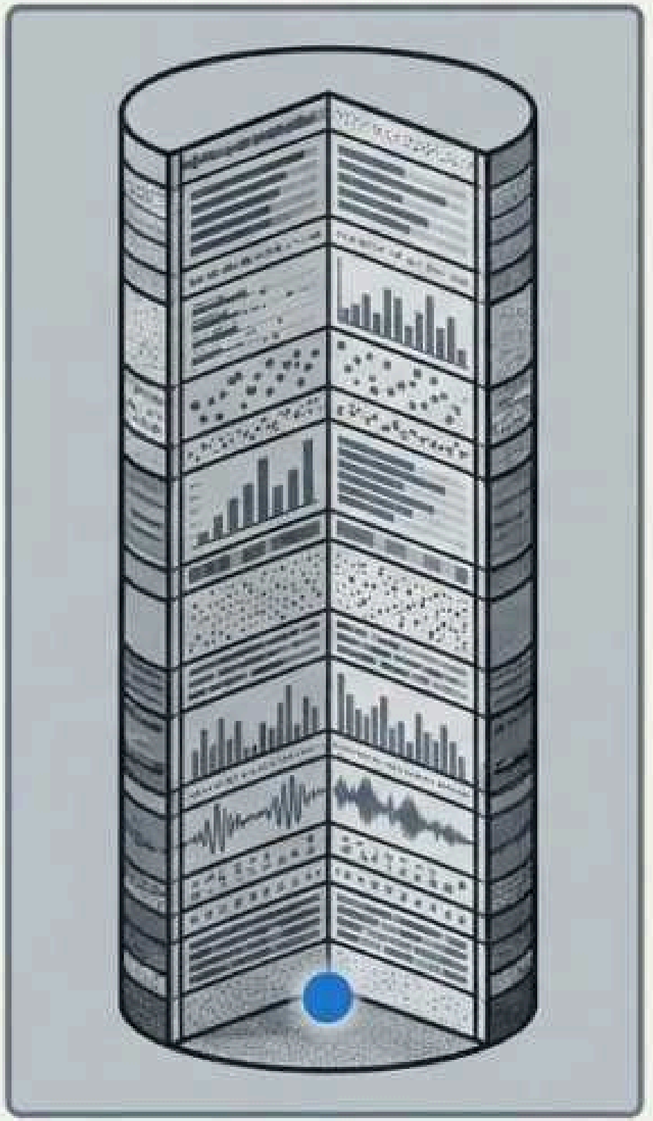
Mitigation Tactics: Observing from a distance, allowing habituation, using unobtrusive measures, or Participant Observation.

Historical Benchmark

A 1956 sociological study where researchers covertly joined a doomsday group to observe reactions when the world did not end.

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3.4



The Case Study: Examining one person in profound depth.

Primary Value

Suggesting foundational ideas about the brain that subsequent research can formally test.

Historical Benchmarks

An 1848 neurological case where an iron rod pierced a railroad worker's frontal lobe, altering personality.

A 1953 surgical case leaving a patient unable to form new memories.

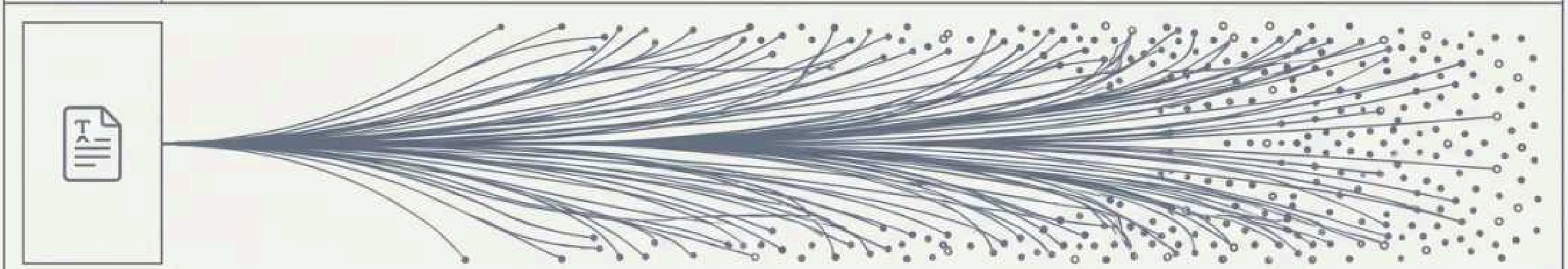
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3.5

Strengths	Vulnerabilities
Excellent for generating new hypotheses.	The individual may be highly unusual (anomalous).
Essential for studying rare, unrepeatable conditions.	Details rely on retrospective reporting, which may be flawed.
	The Fatal Flaw No comparison group. Poor for establishing what is generally true for a wider population.

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3.6 Method: Surveys. Asking identical questions to describe broad attitudes.



Key Strength

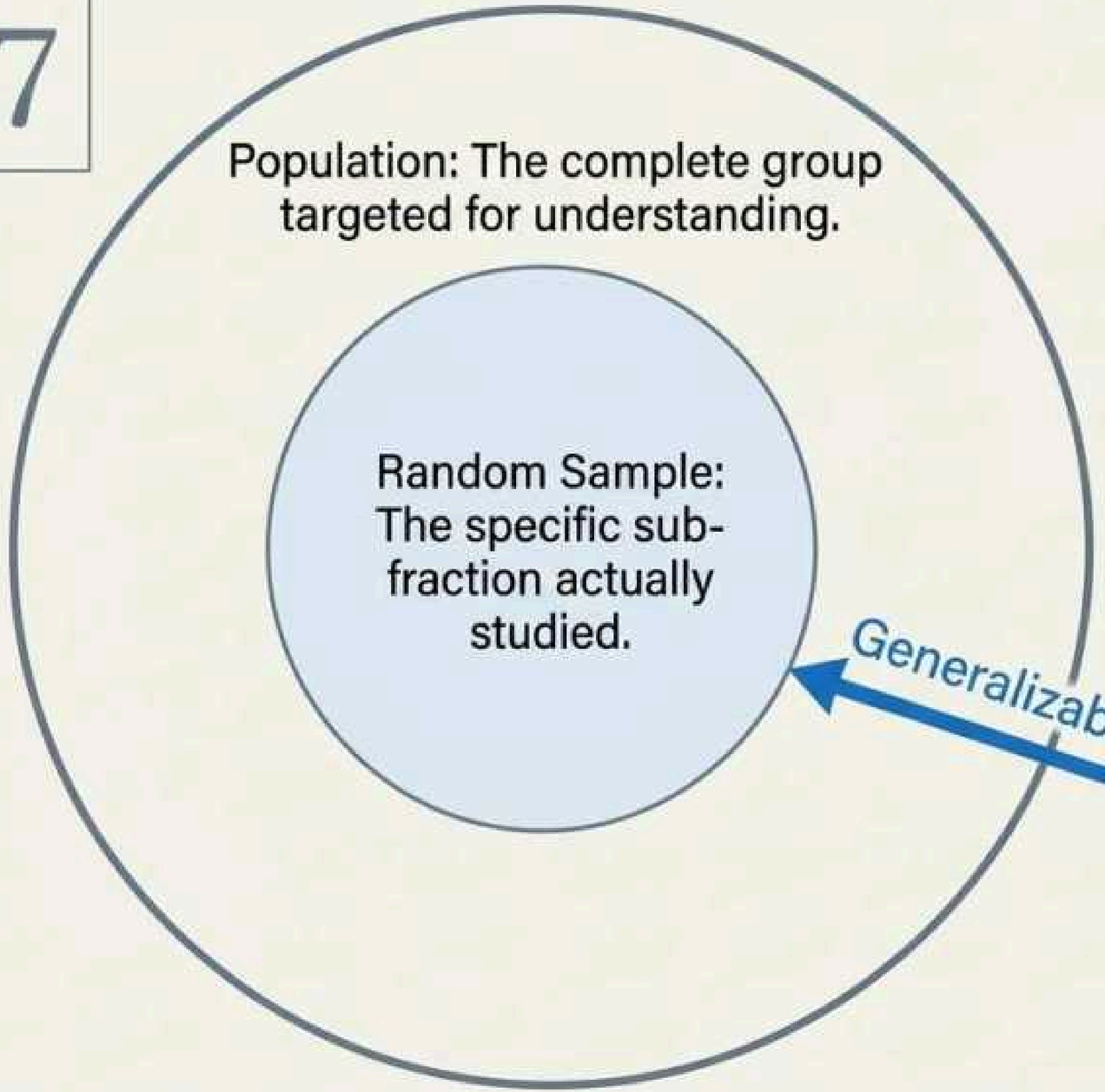
Breadth. A single tool can simultaneously reach thousands via mail, phone, online, or in-person.

Vulnerabilities

- Data is entirely self-reported.
- Outcomes depend critically on who chooses to answer.
- Wording and question order can drastically skew answers, requiring rigorous pre-testing.

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3.7

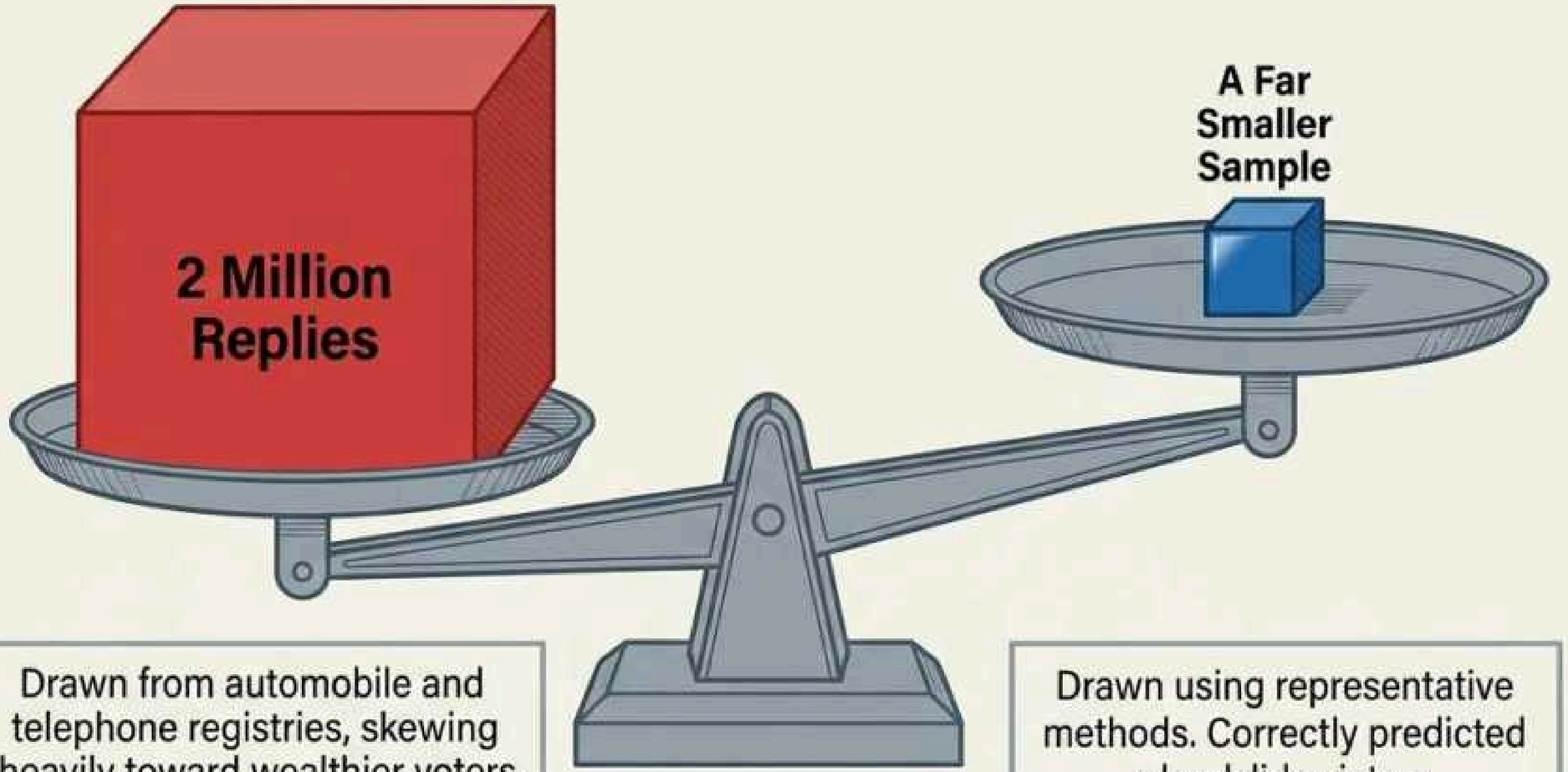


Random Sample Definition:
A selection method where every member of the population has an equal mathematical chance of being chosen.

The Rule:
Only random sampling creates a mirror of the population, permitting confident generalization.

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3.8



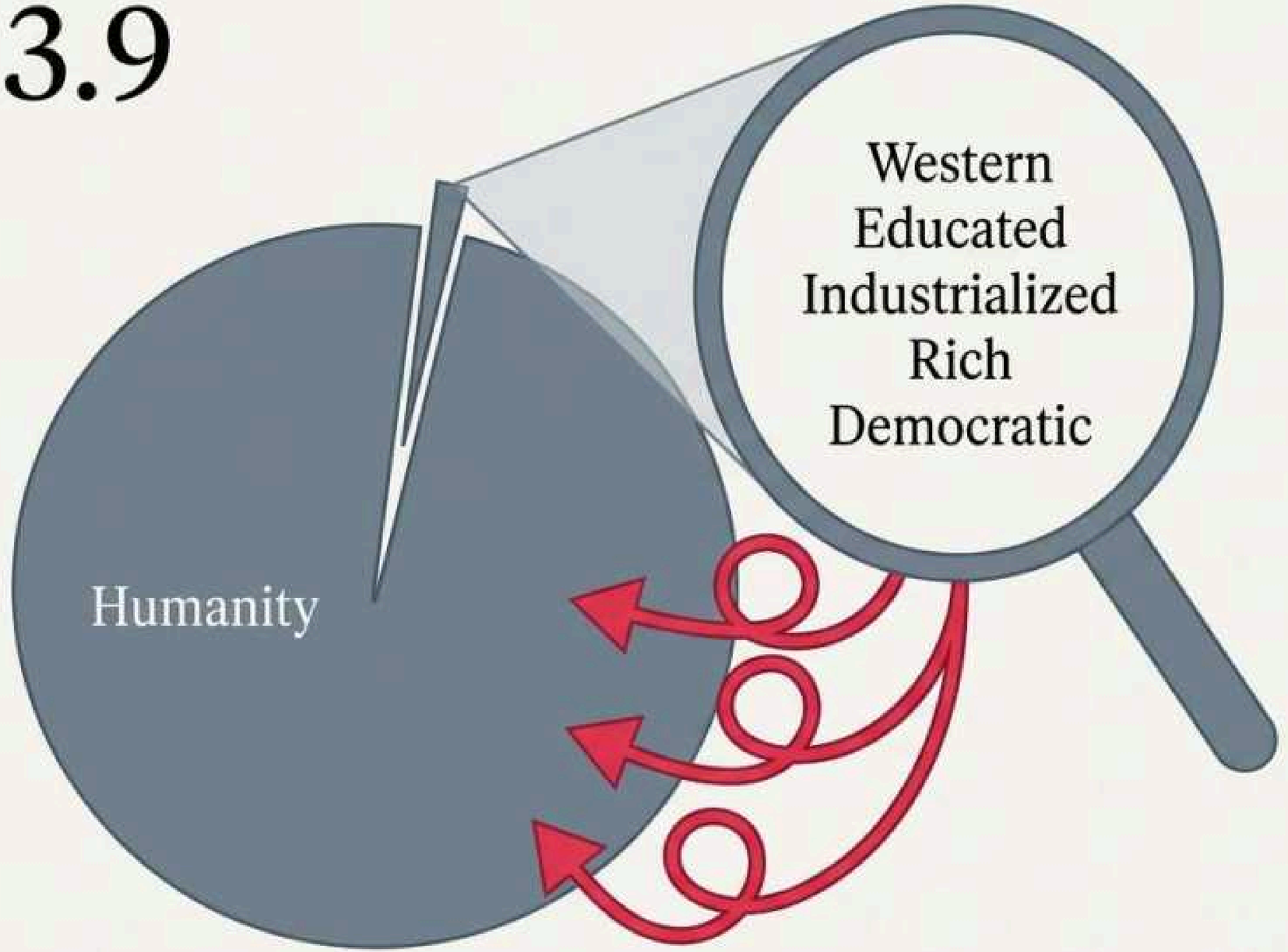
Drawn from automobile and telephone registries, skewing heavily toward wealthier voters. Predicted the wrong winner.

Drawn using representative methods. Correctly predicted a landslide victory.

The Lesson: A massive sample size cannot cure a biased selection method.

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3.9



Convenience Samples

Relying on participants who are simply easy to reach (historically, university students).

The Demographic Critique

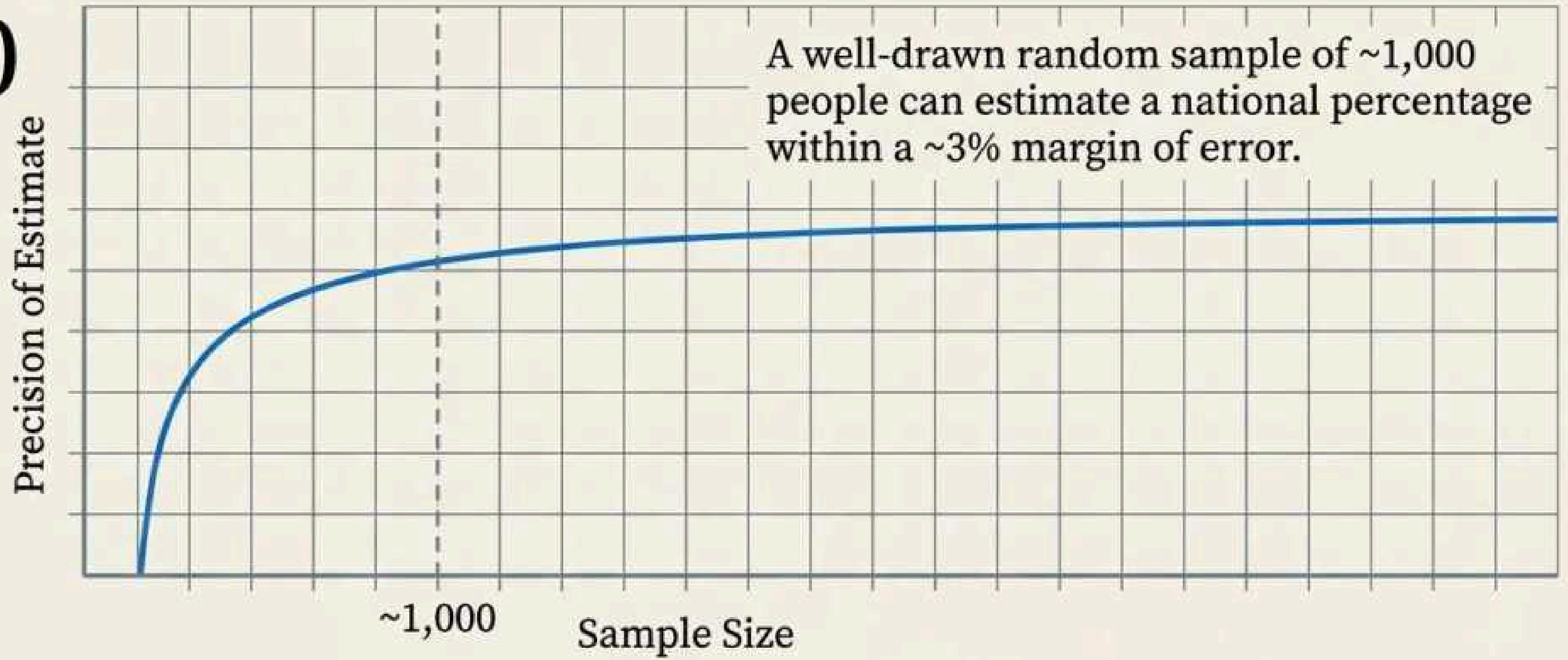
The vast majority of psychological research relies on this specific, highly unusual slice of global demographics.

Consequence

Results found in this specific population often fail to generalize to broader humanity.

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Larger random samples yield more precise estimates, but suffer from extreme diminishing returns.

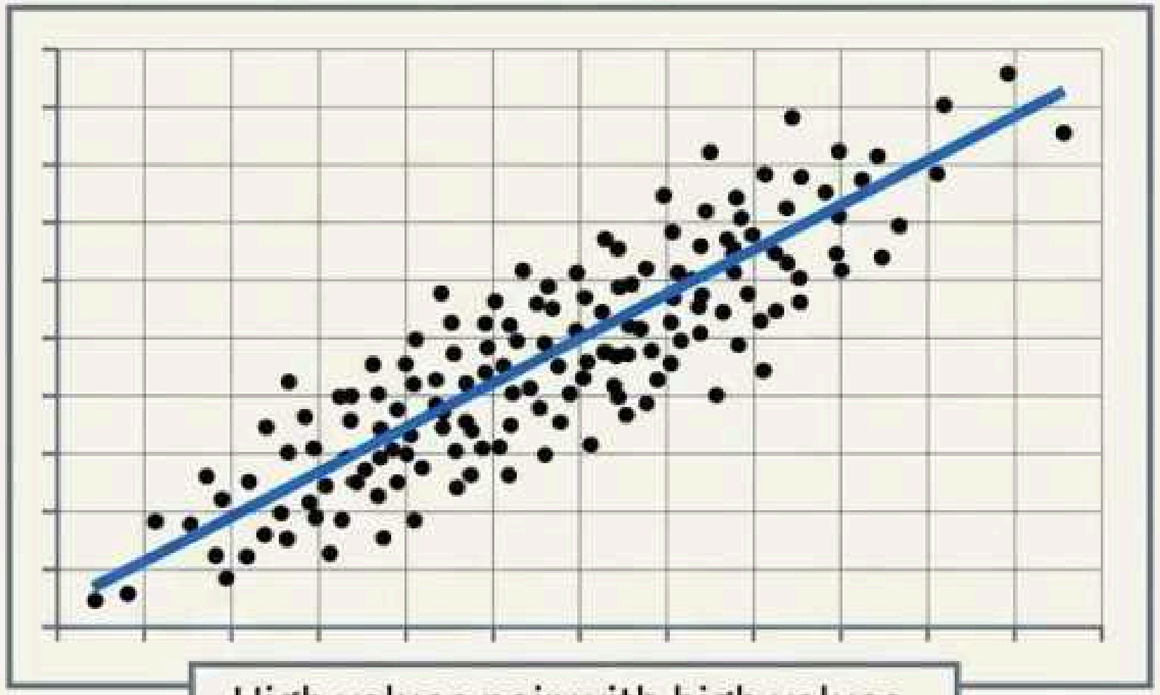
Core Principle: A massive sample drawn badly is still biased. Representativeness fundamentally outweighs size.

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3.11

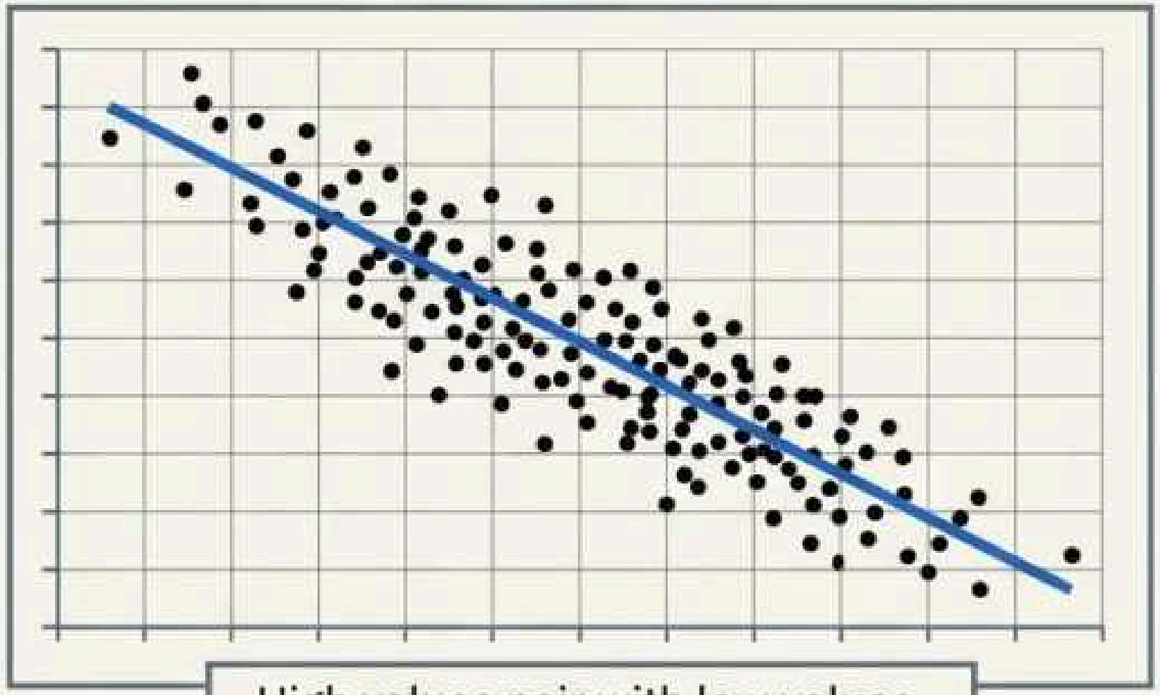
Definition: A correlation describes mathematically how two variables vary together,

Positive Correlation



High values pair with high values.

Negative Correlation



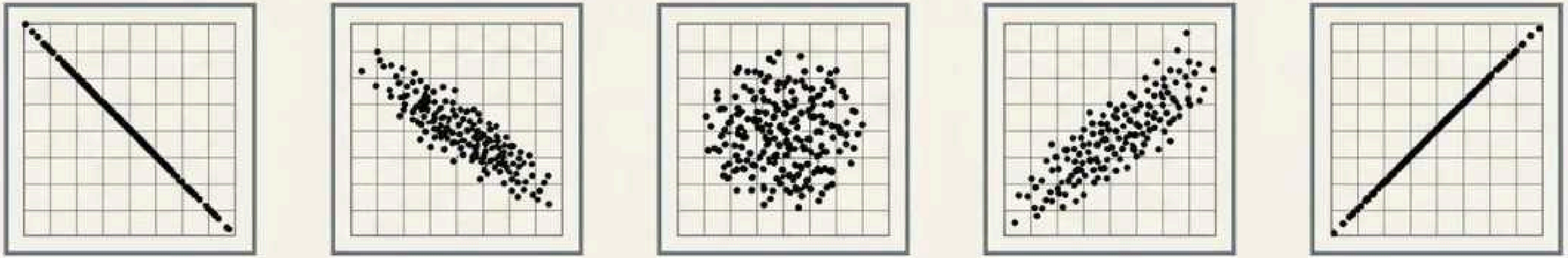
High values pair with low values.

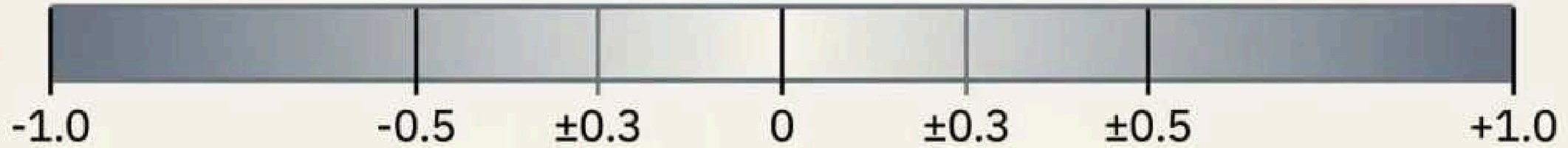
Each dot represents a single person's data across two variables (one mapped to each axis).

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3.12

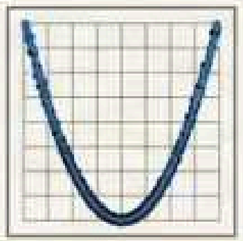
The Coefficient: A single number summarizing direction (sign) and strength (size).





Benchmarks: ~0.1 is small, ~0.3 is medium, ~0.5 is large. ±1.0 is a perfect relationship.

The Caveat:
A coefficient of 0 strictly means no linear relationship.

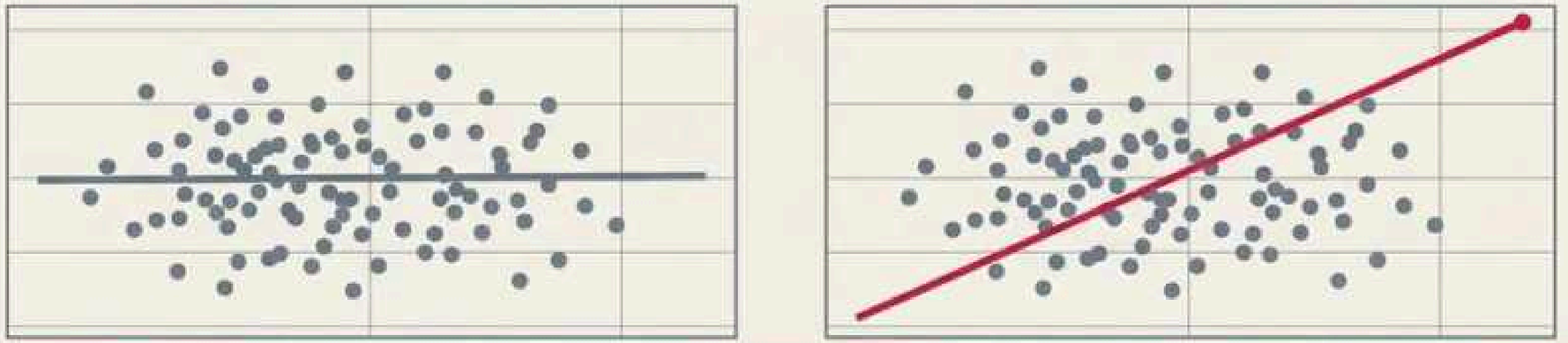


Variables could still be perfectly linked by a curved relationship.

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Caution 1: The Outlier



A single extreme outlier can artificially inflate or destroy a coefficient.

Caution 2: Restricted Range



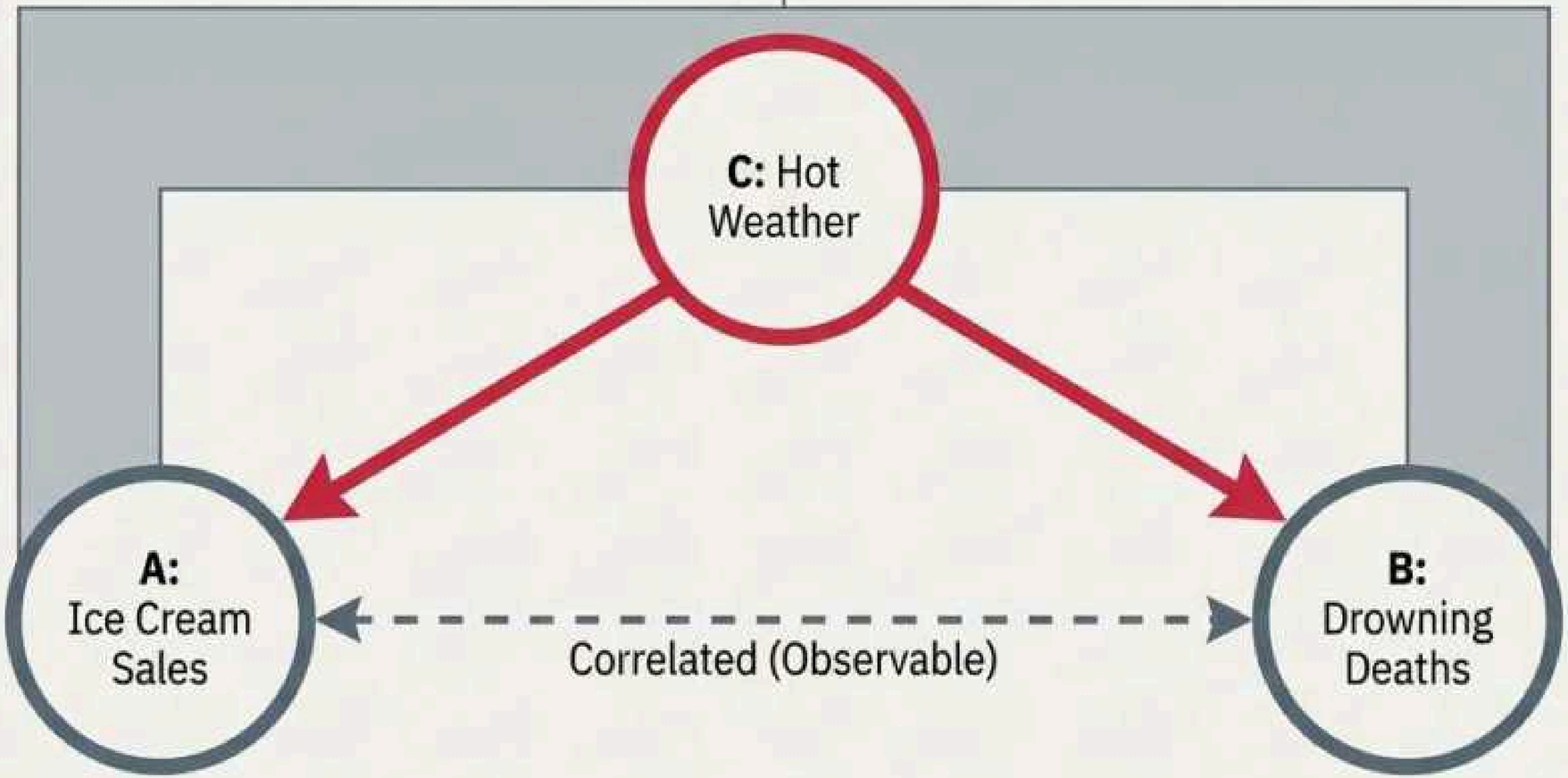
Studying only a narrow band of high performers artificially hides real mathematical links.

Rule: Always view the scatterplot; never rely solely on the number.

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The Core Warning: Correlation does not mean causation.



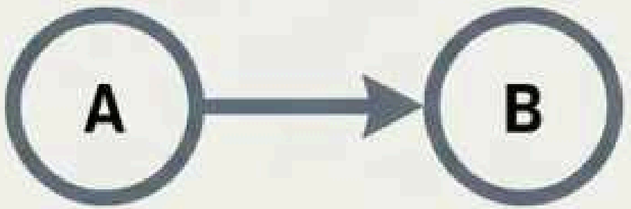
Variables can rise and fall together perfectly without one causing the other.

The Mechanism: A hidden 'Third Variable' (like weather) drives both observable outcomes simultaneously.

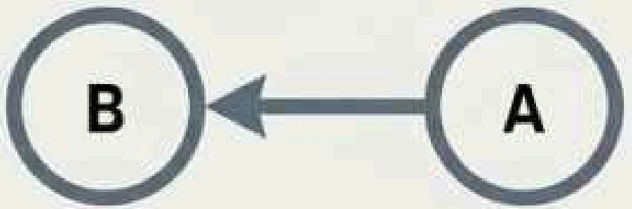
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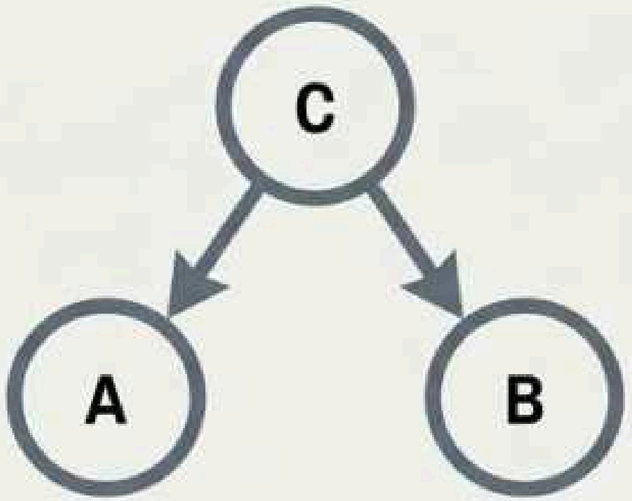
When Variables A and B Correlate: The Exhaustive Tripartite Framework.



A causes B.
(e.g., Does media violence make children aggressive?)



B causes A.
(e.g., Do aggressive children actively seek out violent shows?)



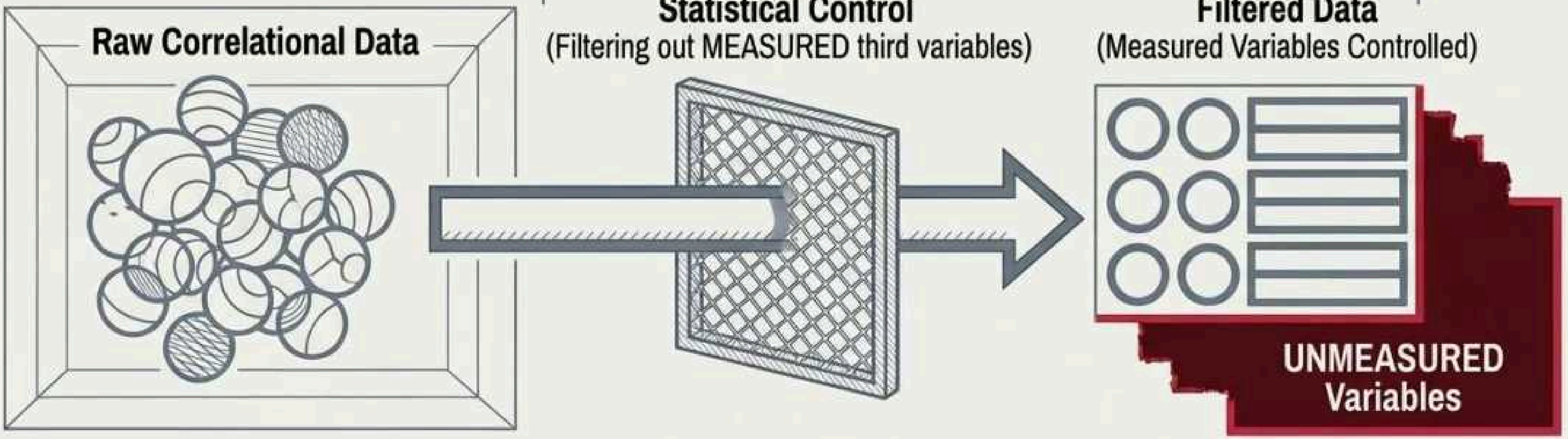
A Third Variable causes both.
(e.g., Does a distinct home-life factor cause both?)

A correlation alone is mathematically incapable of answering which pathway is true.

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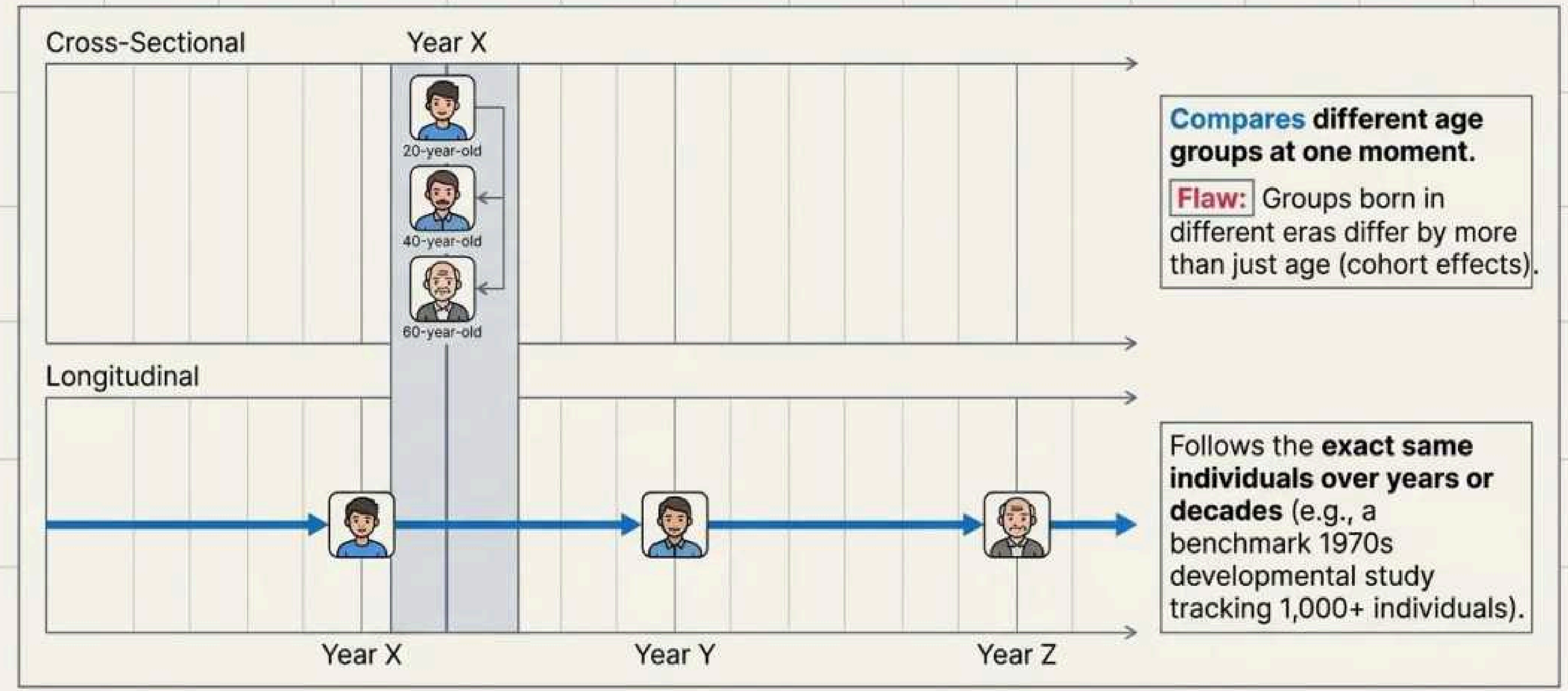
Filtering Process



Statistical Control	The Limit	The Solution
Comparing individuals who are mathematically matched on known third variables to isolate the relationship.	This significantly strengthens the case but can never settle it. There is always the persistent threat of variables that no one thought to measure.	Only a well-designed true experiment can rule out unmeasured variables.

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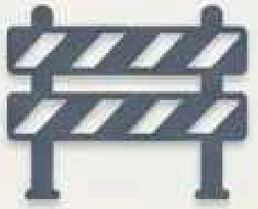
3.17



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3.18 Why Use Correlation?

Ethics & Practicality



Many critical questions cannot be tested experimentally.

We cannot randomly assign human beings to endure abuse or smoke for thirty years.

Forecasting



Even without knowing the underlying cause, we can use correlational variables to accurately forecast futures (e.g., using high school academic data to forecast college success).

Understanding why a method is chosen is just as vital as knowing how it works.

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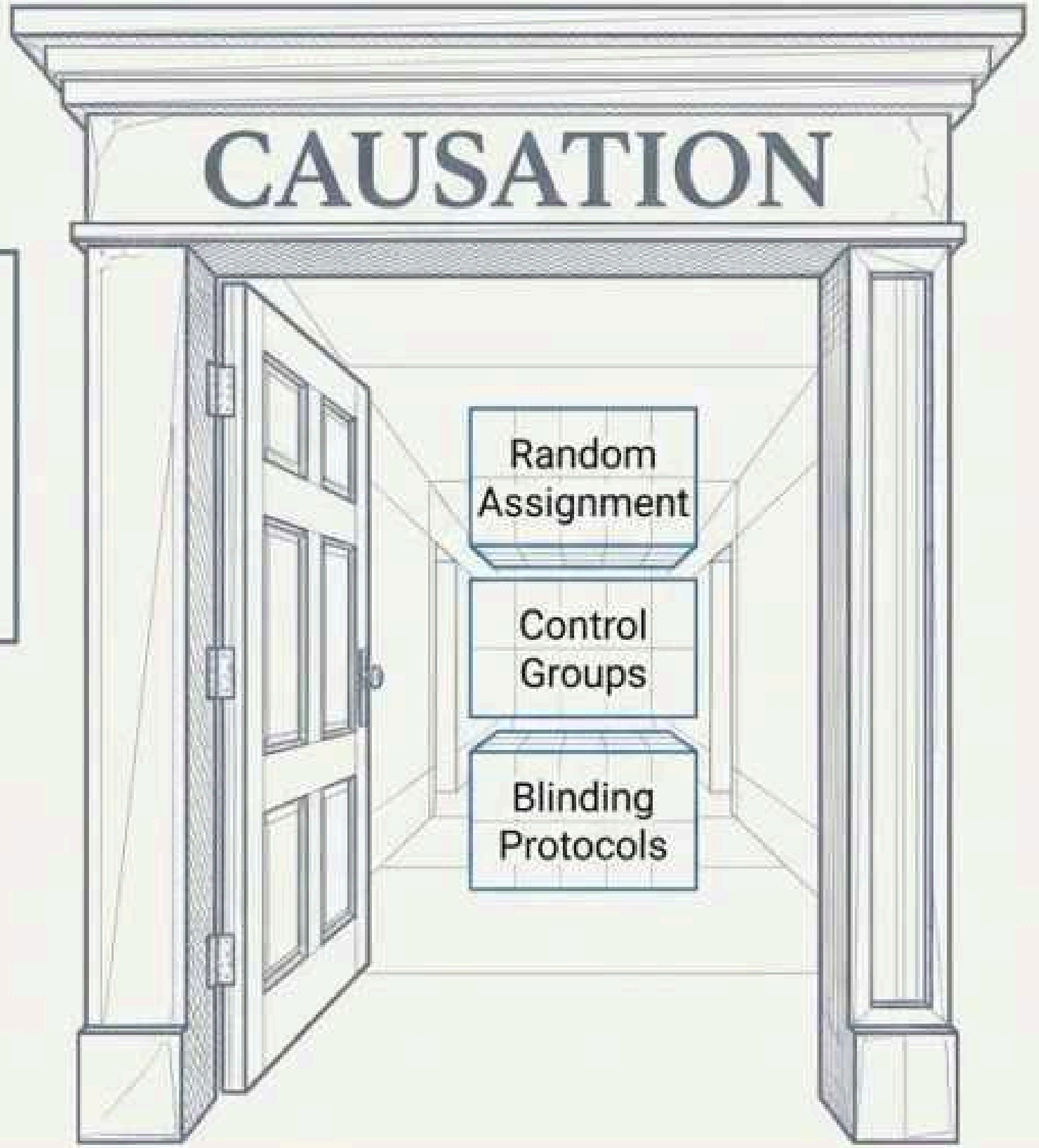
Method	Primary Function	Key Strength	Fundamental Limit
Observation	Describe behavior	Realism	Reactivity
Case Studies	Describe behavior	Depth & Hypotheses	No Comparison Group
Surveys	Describe behavior	Breadth	Biased Samples & Wording
Correlation	Measure relationships	Forecasting	Cannot Prove Cause

Sampling Imperative: A sample must be representative, and random selection is the supreme mathematical method to achieve this.

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The correlational toolkit describes and predicts, but reaches an epistemological wall when determining cause.



To cross the threshold into establishing cause, research must turn to The Experiment.
Next Phase Preview: Experimental design and its failures.

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