Reasoning from examples in philosophy faces a tradeoff about granularity

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Séminaire général de l'IHPST · 12 novembre 2026

Thesis. Underspecified cases invite one family of threats; more specific cases invite a separate family. The result is a tradeoff about granularity, and it is a threat to reasoning from examples as such. It can be mitigated but not avoided.

DEFINITIONS

Reasoning from examples. We present a collection of cases, elicit judgements about them from the reader, and appeal to those judgements to provide defeasible support for a hypothesis about the relation between some collection of variables.

Description, realisations, grain. A case is presented by a description D; its *realisations* W_D are the worlds at which D is true. D is *coarse* to the extent that W_D is large, *fine* to the extent that it is small.

Machery's criterion. The description of an example ought not itself to *state* the hypothesis it is used to support.

$\mathbf{\Gamma}$, the covariate space. The finest relevant partition variable: the Cartesian product of all the other relevant variables. $\mathbf{\Gamma}^*$ is what the reasoner takes $\mathbf{\Gamma}$ to be.

Internal validity. The reasoning correctly measures the effect of the independent variable(s) on the dependent variable(s).

External validity. Internal validity, plus *coverage* of the settings we care about or *stability* of the relation across them.

Simpson's paradox. An association absent or reversed for every value of some partition variable.

Confounder, mediator, collider. Z *confounds* $X \to Y$ if it influences both, not via either; *mediates* if $X \to Z \to Y$; is a *collider* if X and Y each influence Z. Holding a confounder fixed is required; holding a mediator or a collider fixed corrupts the estimate.

Moral Holism. For every nonnormative feature giving rise to a reason in one context, there is a context in which it gives a reason of opposite valence, or none. (*Moral Particularism* = Holism + a combinatorial function not finitely specifiable.)

The bias–variance analogue. As granularity rises, *representational bias* falls and *inferential variance* rises. **BVD**: finer cases tend to elicit finer inferences. **BVN**: the reader *ought* to infer finer propositions, on pain of epistemic irresponsibility.

Threat types. A *use threat* yields to more careful use of a variant; a *constitutive threat* only to a change of variant or species; a *genus threat* attaches to the method as such. Orthogonally: *evidenced* or (so far) *theoretical*.

level		what characterises it
genus	reasoning from examples	—
species	*philosophico-scientific*	models itself on some form of scientific inference; aims to isolate the contribution of a single variable
species	*interpretive*	variable-isolation abandoned: the reader responds to the case *as a whole*, as readers of fiction respond to a fiction, and attends to the historical origins of the case and its concepts (Nussbaum; Williams; Schickore)
variant	*experimental*	the controlled experiment: cases within a comparison-class are matched by stipulation on every apparently relevant variable but one
variant	*observational*	the observational study: rich cases taken as found, confounding handled in the analysis rather than by design
variant	*Bayesian*	the Bayes factor: a case is chosen to be maximally *favourable* to the hypothesis under attack, so that a judgement not conforming to it tells strongly against it (Kripke's Gödel–Schmidt)

CASES

Reach (Kamm). I stand in one part of India with arms long enough to reach a child drowning at the other end.

TRI (McMahan). *Ceteris paribus*, the fundamental determinant of the degree to which a being may permissibly be killed is the strength of its time-relative interest in continuing to live. Argued for by balanced pairs: Bright/Dull, Young/Old.

Berkeley (Bickel et al.). A negative association overall between womanhood and admittance; a positive association within every subject applied for.

Book (Dancy; Horty). That I borrowed a book is a reason to return it — unless you stole it from the library — unless you stole it because you needed it and lacked a fixed address.

Prime (Titelbaum). That my number is under 3 is a reason to think it prime; that it is odd is a reason to think it prime; that it is both entails that it is 1.

Under attack (Kagan). Killing is worse than letting die in balanced pairs; under attack from an aggressor the differential vanishes.

Experiment (Williams). Two people undergo a process that may swap their bodies; one is then paid and the other tortured.

Trolley (Foot; Thomson). A runaway tram can be steered from five onto one; or a bystander at a switch can turn it. Three good-faith readings of 'hold all else equal': *absence*, *openness*, and *sameness* — filled in identically, but at some **grain**.

Hesslow's case. A treatment harms directly and helps indirectly, by inhibiting something worse. Condition on the mediator and you infer only the harm.

Emma (Flaubert). Emma Bovary, and her abandonment by Rodolphe, as described in Flaubert's novel.

THE TWO FAMILIES OF THREAT

§	threat	type	status	
From underspecification				
3.1	grasping failures	genus	argued	*Reach*
3.2	internal validity	use	theoretical	Simpson reversal in the reader's doxastic states
3.3	truncation	use	theoretical	cells of $\mathbf{\Gamma}$ never visited
3.3	balancing	constitutive	evidenced	balanced pairs are combinations nothing instantiates
3.4	non-monotonicity	use	evidenced	*Book*, *Prime*, *Under attack*
3.5	divergent completions	use	evidenced	readings A, B, sameness; reproducibility; biased completion
3.6	adequacy	constitutive	argued	particularity; interpretive engagement
From overspecification				
4.1	disagreement	use	evidenced	*faux agreement* may hide latent disagreement
4.2	preclusion of commonplaces	use	evidenced	common knowledge, on fine descriptions
4.3	misleading estimates	use	evidenced	mediators and colliders
4.4	bias–variance analogue	genus	theoretical	*Emma*

Classification is relative to the *experimental* variant. 4.1 and 4.2 are constitutive for the *observational* variant, whose cases cannot be coarsened, and no threat at all to the *interpretive* species.

KEY THESES

- The threats of §3 and §4 cannot be met jointly: what meets those of §3 is detail, and detail incurs those of §4.
- The tradeoff is a **genus threat**—it attaches to reasoning from examples as such—and it is not peculiar to philosophy. Any case-based inquiry must choose a grain and incur the costs of the choice.
- The appropriate granularity is relative to an ⟨inquiry, context⟩ pair; on *Epistemology as Modelling*, it is that of the model which best serves the inquiry's aims in that context. That no granularity is costless is compatible with there being, for a given pair, a grain whose costs it is better to bear than any other's. **Appropriateness is the best position within the tradeoff.**
- Three contextual parameters price the two errors: the *contrast class* (which alternatives are live fixes which details bear); the *domain of extrapolation* (denser ⇒ finer principle tolerated); the *relative costs* of the two errors.
- No set of pre-inquiry heuristics settles the appropriate granularity in advance; for certain inquiries it emerges only once work is under way.
- **Cautious use** means use with *qualifications*—a statement of which horn the modelling decisions have embraced, which threats attend, and how if at all they have been mitigated—and not rarer use.

HEURISTICS, TWO DESTINATIONS, AND ANALOGUES OUTSIDE PHILOSOPHY

Sensitivity analysis. A *within-grain* check that a judgement is stable across the values of $\mathbf{\Gamma}^*$; a *cross-grain* check that it survives reasonable refinement and coarsening of $\mathbf{\Gamma}^*$ itself.

Accessibility. Other things equal, prefer grains readers can epistemically access and track. Credible results in other fields may inform the choice.

Constitutive failures of the experimental variant may rationally motivate abandonment. Two destinations: the **observational variant**—richer cases, confounding handled analytically, internal validity traded for external, which relocates the genus threat without escaping it but secures *transparency* about the adjustment set; and **interpretive engagement** (Nussbaum; Williams; Schickore in HPS)—abandon the variable-isolating aspiration altogether.

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