

Handout for Nomological Expressivism (Work-in-Progress)

– Josh Hunt, June 2023

1 Overview

- *Motivation*: scientists' nomological thought and talk seems eminently rational and conducive to the aims of science. Even by empiricist standards!
- **Goal**: vindicate nomological discourse while avoiding substantial metaphysical posits (e.g. to primitive modality, simplicity, naturalness, etc.)
- Humean BSAs avoid positing primitive modal notions, but they either (i) fail to vindicate the objectivity and mind-independence of nomological discourse (pragmatic BSAs) or (ii) require substantial metaphysical posits (e.g. Lewisian naturalness or mind-independent simplicity metric)
- Claim: expressivism threads the needle, underwriting a better Humeanism
- Marc Lange's (2009) account of laws of nature vindicates many intricate aspects of modal discourse in science, including graded modal claims. However, it involves commitment to primitively-true counterfactuals
- *Aim*: preserve structure of Lange's account while avoiding this commitment
- Seems sufficient to have a non-descriptivist account of counterfactuals
- Chief advantages over Ward (2002): (i) vindicates graded modal discourse re: meta-laws and symmetries; (ii) does not presuppose time-evolution picture

2 Aiming for Internal Vindication

- To **internally vindicate** a discourse is to show that the (intelligible) claims made *within it* are in good standing. Practitioners ought to continue using the discourse, perhaps even *improving* it relative to the aims of their practice.
- Equivalent to providing what Gibbard (2003, p. 186) calls *an internally adequate account* of that discourse
- Various realisms share aim of internal vindication but strive for *external vindication*: vindicate realist-sounding commentary on the discourse/practice that takes place outside the practice itself
- When it comes to *external claims* about the objectivity and mind-independence of laws of nature, expressivists can remain agnostic.
- Expressivism aims to vindicate *internal claims* (made by scientists within engaged contexts) regarding laws, meta-laws, their objectivity, etc.
- Two different kinds of context, from Horgan and Timmons (2015, p. 207):
 - *Engaged contexts*: wherein practitioners *use* a given discourse, rather than mention it from an outside perspective → internal claims
 - *Detached contexts*, wherein we step outside of one discourse and into another (e.g. the “philosopher’s room”) → external claims

3 A Dilemma for Humean BSAs

- **Best System Accounts** (BSAs): laws are logical consequences of a scientific axiom system that best balances a few privileged epistemic virtues—e.g. simplicity and strength—applied to mosaic of past, present, future events
- Humean laws do not govern, and they do not constrain states of affairs.
- They describe what has happened and aid prediction of future events.
- **Dilemma:** for a BSA to vindicate objectivity of law-claims, it must make substantial metaphysical posits (e.g. to perfectly natural properties)
- Lewis (1983): posits perfectly natural properties and objective simplicity
- Plausibly, Lewis can vindicate objectivity of laws, although Belot (2022) worries that even Lewis’s account renders laws of nature mind-dependent.
- Pragmatic BSAs weaken these commitments, but then the relevant notion of simplicity becomes agent- or interest-relative:
 - What counts as simple varies based on (i) ordinary cognitive capacities of scientific agents in an epistemic community or on (ii) the domain of phenomena under investigation.
 - So pragmatic BSAs render laws of nature agent-relative, thereby failing to vindicate key aspects of scientists’ nomological discourse.
 - e.g. Chris Dorst argues that the laws depend on what is “predictively useful for creatures like us” (2019, p. 886).
- Couldn’t we simply ‘expressivize’ Lewis’s perfectly natural properties, objective simplicity, and objective balance of simplicity vs. strength? (e.g. to judge that a property is perfectly natural or fundamental is to express an attitude of *being for privileging* that property in answering why-questions)
- *Further issue:* BSAs must vindicate graded modal claims about meta-laws

4 Subjunctives as Being for Expecting

- Context: I am holding a coffee mug above my desk. I judge the following subjunctive to be true: ⟨If I were to release my coffee mug, it would fall⟩.
- Expresses an attitude of *being for expecting* my mug to fall in a hypothetical scenario where it is released.
- Via norm-acceptance: express acceptance of a set of norms that recommend *expecting my mug to fall* in a hypothetical scenario where I release it.
- Handle counterfactuals as subjunctives dealing with (non)-events in the past

- 1.) $\langle$ If it had been the case that it rained yesterday, then the sidewalks would have gotten wet $\rangle$. Take this to be equivalent (for philosophical purposes) to
- 2.) $\langle$ If it were to have rained yesterday, then it would have been the case that the sidewalks got wet $\rangle$

Proposal: Expecting

SUBJUNCTIVES_{expecting}: to judge that $\langle$ If Φ were the case, then Ψ would be the case $\rangle$ is to express an attitude of being for expecting Ψ to occur in a hypothetical scenario where Φ occurs.

–Via *norm-acceptance*: express acceptance of a set of norms that recommend *expecting* Ψ in a hypothetical scenario where Φ obtains.

COUNTERFACTUALS_{expecting}: to judge that $\langle$ If it had been the case that Φ , then Ψ would be (or have been) the case $\rangle$ is to express an attitude of being for expecting Ψ to be the case in a hypothetical scenario where Φ has occurred.

4.1 Considerations for and against ‘Being for expecting’

- Definitions of **expect**: “to consider probable or certain” or “to regard (something) as likely to happen”
 - naturally gradated: we can expect something to various degrees
 - Facilitates extending the account to counterfactuals uttered in a probabilistic or indeterministic context
 - E.g., we can allow that there is a tiny chance that the mug will levitate, but still be in favor of expecting it to fall
 - Allows for contextual threshold on credence necessary for expecting
 - “being for expecting” as *being for planning to bet on*: you might not believe Ψ would happen, but you would be in favor of betting on it if forced to bet (e.g. setting aside practical considerations and risk).
- *Why not use ‘being for inferring’?*
- Response: in some cases, we may not actually be inferring anything.
 - And we may not be in favor of someone carrying out an inference.
 - *Analogy*: a utilitarian is not necessarily in favor of someone figuring out what to do by first explicitly calculating
- Worry: does the proposal involve hypothetical expectations?
- Response: no. It involves actual expectations about hypothetical scenarios.

5 Expressivism about Laws of Nature

- Gloss on Lange: first-order laws comprise the largest, non-maximal set of logically closed, counterfactually stable claims that don't explicitly reference laws (i.e. "sub-nomic claims"). Call this set " Λ "
- Consider the sub-nomic claim Ψ : "the speed of light is c ."
- To judge that Ψ is a law is to express an attitude of *being for expecting* Ψ to be the case no matter what logically-consistent (possibly nested) counterfactual or subjunctive antecedents hypothetically obtain.
- Like on Lange's account, in judging that Ψ is a law of nature, I take it to belong at least to the largest, non-maximal sub-nomically stable set, Λ .
- I interpret claims about sub-nomic stability as expressing pro-attitudes toward a great number of expectations in various hypothetical scenarios.
- In judging that this set Λ exists, I express an attitude of *being for expecting its members to be the case*, regardless of which logically-consistent subjunctive (or counterfactual) antecedents were to (have) obtain(ed).
- Following Lange, we can straightforwardly extend this analysis to first-order laws that are more necessary than others (e.g. conservation laws) and also meta-laws arising from symmetries (e.g. rotational invariance).
- In judging a conservation law to be more necessary than a force law, I express an attitude of *being for expecting the conservation law to hold* in any logically-consistent hypothetical scenario where the force law is different.

6 Internal Vindication à la Expressivism

- Must vindicate even those aspects of a discourse that sound 'realist', including claims that such-and-such is *true*, *a fact*, *objective*, or *mind-independent*
- Within scientifically-engaged contexts, we routinely make claims like the following: $\langle$ it's a fact that nothing can travel faster than the speed of light $\rangle$ or $\langle$ whatever the laws are, they don't depend on what we think they are $\rangle$.
- *Strategy*: appeal to counterfactual objectivity and truth-minimalism
- Consider $\langle$ objectively, nothing can travel faster than the speed of light $\rangle$:
 - Expresses acceptance of a set of norms that recommend *expecting nothing to travel faster than light*, regardless of what anyone thinks
 - Lange's framework entails counterfactual objectivity: in judging a claim to be a law, we take it to belong to a sub-nomically stable set
- Consider $\langle$ it's true that nothing can travel faster than the speed of light $\rangle$

- Apply minimalism about truth, using a disquotational principle
- To judge that $\langle$ “nothing can travel faster than the speed of light” is true $\rangle$ is to judge that $\langle$ nothing can travel faster than the speed of light $\rangle$
- Statements are truth-apt if we can agree or disagree about them
- No serious problem of “creeping minimalism”: in a detached context, an expressivist can remain agnostic as to whether or not claims from the discourse are true. A realist will say they are true (in a non-deflationary sense).

7 Whence *these* norms?

- Science has some *constitutive aims* that provide minimal criteria for success
- Insofar as agents like us (e.g. not logically or physically omniscient) do science, they must at least aim at empirical adequacy
- Inductively, some norms of subjunctive reasoning are *better* for facilitating empirically adequate theories
- Scientists can *improve* their nomological norms relative to these aims
- This story is part of the *meta-semantics* behind our nomological concepts
- Unlike with pragmatic BSAs, the aims of science—and what facilitates them—are not part of the *semantic content* of nomological claims

8 Lange’s account of laws and meta-laws

- Laws and meta-laws form a modal hierarchy, e.g. symmetry principles can function as meta-laws that constrain the form of first-order laws
- *Helpful but circular slogan* which Lange aims to recover non-circularly: the laws are invariant under every counterfactual antecedent that is logically consistent with the laws
- **sub-nomic claim**: does not make a claim about lawhood, e.g. “the speed of light is $2.998 \cdot 10^8 \text{ m/s}$ ” and “Mount Everest is Earth’s highest mountain”
- **nomic claim**: truth-conditions involve what the laws are, e.g. “it is a law that the speed of light is c ” and “it is an accident that Mount Everest is the highest mountain on earth”
- Distinguish laws from accidents by considering counterfactual stability:
- **Sub-nomic stability** (SNS): a non-empty set of sub-nomic claims is *sub-nomically stable* provided that (i) it is closed under sub-nomic logical consequence, and (ii) its statements remain true under all (nested) counterfactual suppositions that are logically consistent with its members

- “ Λ ”: Interpret the largest, non-maximal sub-nomically stable set, Λ , as comprising the first-order laws, containing no accidents
- **Hierarchy property**: given two sub-nomically stable sets, one is necessarily a proper subset of the other ($\Rightarrow$ other SNS sets are subsets of Λ)
 - Interpret conservation laws as belonging to a proper subset “ Λ^+ ” of Λ : its members are stable under logically-consistent counterfactual antecedents that alter the members of Λ (such as force laws)
 - $\Rightarrow$ laws in Λ^+ are more necessary than the laws just in Λ
 - Vindicates physicists’ discourse that the conservation law would remain true even if the force law were different

8.1 Lange on Meta-Laws

- Next, focus on the counterfactual stability of *nomic claims*:
- **Nomic stability** (NS): a non-empty set of nomic or sub-nomic claims is *nomically stable* provided that (i) it is closed under nomic/sub-nomic logical consequence, and (ii) its statements remain true under all (nested) counterfactual suppositions that are logically consistent with its members
- Nomically stable sets also form a modal hierarchy:
- Interpret symmetry principles—such as the rotational invariance of force laws—as belonging to a special subset Λ^{meta} of the largest non-maximal nomically stable set Λ_{nomic}
- Ontological cost of Lange’s account: posits primitive counterfactuals as the truth-makers for the stability properties of sub-nomic and nomic sets
- My goal: interpret nomological discourse as manifesting the conceptual structure of Lange’s account, while avoiding its ontological commitments

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