

Book of Abstracts

Shanghai-Hong Kong Philosophy of Science Workshop I 'New Directions and Challenges in 21st Century Philosophy of Science'

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The Origin of Strong and Weak Normativities

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To know is to have reasons to believe; to act morally is to act by behavioral norms; ... To be a responsible member of a community is to have the ability to properly react to norms and rules in thinking, acting, etc. Normative behavior consists of actions that are subject to evaluation of reasons and norms, and both human and non-human animals exhibit normative behavior to varying degrees. Scientists (Tomasello et al) and philosophers (Sterelny et al) have argued that humans alone possess the ability to recognize, and cooperate with, members of their community with a sense of collective intentionality or commitment. Such a strong commitment to cooperation is the foundation for human knowledge, morality and culture. In this talk I argue that what is common in the evolved collective international or strong cooperative regimes is a new kind of “normativity,” which is uniquely human. I call it the “strong normativity,” which differs from the regular or “weak normativity,” or rationality, that humans and animals share of varying degrees (weak normativity governs behavior on the individual level that we see an idealized form in, e.g., bounded economic rationality). Strong normativity is collective and objective, while weak normativity or rationality is individual and inter-subjective. Strong normativity grounds a social reality in human societies that non-human animals, having only the weak normativity, lack.

The Synthetic A priori: Chang or Friedman?

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Recently, there has been a revival of the Neo-Kantian tradition in Michael Friedman’s *Dynamics of Reason*. At the same time, Hasok Chang has given great emphasis to “ontological principles” in scientific practices and their role in epistemic iteration. In this paper, I will discern the features of the constitutive a priori that both Chang and Friedman share and I will answer three questions about this shared framework. First, given that these constitutive principles cannot be justified by experience directly, how does the iterative process of empirical research provide a justification for them? How can history be a justification at all? Second, what is the status of these principles? Can researchers choose to uphold or discard them at will, or is their use normatively bound up to the investigative practice in a stronger sense? Third, what role does philosophical reflection play in the dynamical process of reinterpreting, discarding or maintaining these principles?

In Defence of the Epistemic Approach to the Problem of Vagueness

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According to the traditional principle of bivalence in logic, a proposition is either true or false. However, when considering a proposition such as “Across the stones lies the Amazon jungle”, it becomes difficult to determine which specific stone marks the boundary of the Amazon jungle. If the proposition “across the stone A lies the Amazon jungle” is true, then the propositions like “across the stone B or C... lies the Amazon jungle” are false. The problem is that we could not find which stone is the exact “stone A”. In order to solve this problem of vagueness, many philosophers proposed solutions. Sören Halldén assumes that there is three-valued logic, which defines that only when a proposition is true or false, it is meaningful, or else it is meaningless (Halldén, 1949, p.9). Henryk Mehlberg points out that there are theoretical vocabulary and observational vocabulary when describing phenomena. Typically, more than one interpretation is admissible for theoretical vocabulary. For instance, when depicting how the pen dropped to the ground, people may use the vocabulary of “gravity”, and “gravity” has more than one interpretation in physical theories. Mehlberg proposes the theory of supervaluations, which holds the idea that a proposition is supertrue if it is true on all admissible interpretations and superfalse if it is false on all admissible interpretations (Mehlberg, 1958, p.256). After examining their ideas, I found that they are still trapped in the problem of dealing with the exact boundary to eliminate the vagueness. To address the problem of vagueness, Timothy Williamson proposes the epistemic view of vagueness and insists that objects are vague in a modest sense, for the impossibility of knowing their boundaries may be independent of the way in which the objects are represented (Williamson, 1994, p.6). I will try to defend why the epistemic view is more convincing and develop it.

Beyond the Algorithm: Rethinking Network Account of Trustworthy AI through Lexical Threshold-Based Multidimensional Utility Analysis

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Abstract: In this project, we argue that the network account of trustworthy AI offers a better alternative to the other main frameworks in current literature of trustworthy AI. We identify and illustrate the possible nodes within an AI network, specify the key attributes each node should possess, and clarify what constitutes a sufficient threshold for each attribute. Building on this foundation, we introduce a novel framework for the network account of trustworthy AI: Lexical Threshold-Based Multidimensional Utility Theory (LTMU). This framework lexically ranks trust-relevant attributes, establishes minimum thresholds for each and assess each attribute with a distinct utility scale. We then demonstrate how the LTMU framework can be applied to analyze two exceptional cases in which trust-relevant attributes come into conflict in different ways, arguing that its application yields reasonable and defensible outcomes in both scenarios.

Newtonian vs Galilean Substantivalism in Newtonian Physics

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It is widely held that, in the context of Newtonian physics, Galilean substantivalism, according to which material objects don't have any absolute velocities, is better than Newtonian substantivalism, according to which they do. I will argue that this widely held view is unjustified and that, at least given certain background assumptions, Newtonian substantivalism is in fact better than Galilean substantivalism.

Objectual Understanding of the Disagreement of Degree

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Roughly, accounts of objectual understanding divide into Factivism and non-Factivism. Both sides establish their views by comparing degrees of understanding, e.g., Factivism may claim that a more probable explanation confers better understanding. So, naturally, they disagree on how understanding admits of degree. In this paper, I distinguish two relations among understanding (U), explanation (E), and phenomenon (P): the “explanation-contained” case, $E(U,P)$, where an explanation (or theory) E itself embodies an understanding of P; and the “explanation-enabling” case, $U(E,P)$, where an agent's understanding U makes possible the production of explanatory accounts E for P. On that basis, I dissolve the disagreement above and defend a non-factive account of objectual understanding.

To be specific, I show that moderate Factivism (or hybrid accounts) routinely conflates these two cases. I then examine Kelp's reply (2017) to the objections of Factivism from Elgin (2009) and Zagzebski (2001). I argue that Kelp's defense of Factivism equivocates between the two cases. If one attends to only one case, i.e., $E(U,P)$, the factive requirement for understanding may seem intuitive, but such an account will encounter substantive theoretical costs. Finally, I argue that Elgin's non-factive account of objectual understanding better fits the kind of understanding prized in scientific practice, i.e., $U(E,P)$, and I sharpen that account by spelling out the abilities (or performance) it requires via examples in social science.

Grounding, Internality and Actuality

Chaoan He

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Grounding, the central notion to capture metaphysical priority and non-causal explanation, is usually thought to be connected to modality in two related ways. According to the principle of Necessitation, the ground *necessitates* the grounded; and according to the principle of Internality, the ground *necessarily* grounds the grounded. Both principles receive well-known challenges. But the common challenges can be plausibly met by the so-called Completer

Strategy. In this talk, I consider one recent case, from Baron-Schmitt 2021, against Internality, which escapes the Completer Strategy. I argue that the case is rather misguided, for it does not even pose any trouble for Internality in the first place, once the relevant grounding relation is carefully clarified. Then I tentatively put forward a new case against Internality. The new case rests on modally rigidified facts such as <John *actually* kills Jack>, or <John kills Jack in the actual world>. I argue that <John kills Jack> fully grounds <John *actually* kills Jack>, but not necessarily so.

Was Darwin a Teleologist?

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Biology stands apart from other natural sciences by its unique reliance on functional explanations. While chemists do not attribute purposes to covalent bonds, nor do astronomers to planets, biologists routinely state that heart pumps blood to deliver nutrients and oxygen to the tissues, or that B cells produce antibodies to fight infections. The language of biology is inherently teleological. According to the traditional view, Darwin's theory of natural selection provided a non-teleological basis for such functional explanations, or even purged teleology from biology. As Karl Marx remarked, Darwin had "delivered a death blow to teleology in biology." A careful reading of Darwin's own writings, however, reveals that it is not how Darwin himself viewed his achievement.

The paper puts forward two arguments: first, Darwin's contribution was not the elimination of teleology, but its transformation and reconciliation with science by providing a mechanism of explaining backward causality, where a thing's existence is explained by an effect that the thing makes possible. Second, having established the case for Darwinian teleology, I explore what specific formulation of teleology permitted by Darwin's work, and outline the constraints on its legitimate use within the context of modern evolutionary biology.

Three Senses of Philosophy of Animal

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The past few decades have witnessed rapid growth in the literature on animal minds, animal cognition, animal ethics, and animal welfare. I contend that it is the right time to establish a field of study, called animal philosophy or philosophy of animal (动物哲学). I shall clarify three senses of philosophy of animal, and argue how an active philosophy of animal might shed new light on many important philosophical issues.

Life, consciousness, and voodoo death

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Philosophical zombies—entities identical to humans but lacking conscious experience—have long served as the go-to thought experiment for illustrating the ‘hard problem of consciousness’: why subjective experience should arise at all from physical processes. This essay introduces another Haitian concept to counter the zombie intuition that mind can be separated from life processes: ‘voodoo death.’ Voodoo death refers to the death of a person caused by the expectation of dying rather than organic causes. Drawing on studies of this phenomenon and interpreting it through two contemporary biogenic theories of the mind—enactivism and the free-energy principle—this essay argues that ‘voodoo death’ is an extreme manifestation of a broader phenomenon in which consciousness plays an active role in the process of dying. Consciousness, the argument suggests, is intrinsic to biology—not only because it is intrinsic to life but also because it is inextricably tied to death.

Role of Nomenclature in Paradigm Shift: A Case Study of the Chemical Revolution

Qiyue Zhang

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The reconstruction of scientific language is inextricably linked to the occurrence of scientific revolutions. The inquiry into and practice of what nomenclature a science adopts plays a constitutive role in paradigm shift. Its development and acceptance are not merely products of scientific activity but can actively shape the trajectory of a discipline.

As representatives of the paradigms before and after the Chemical Revolution, both Priestley and Lavoisier discussed their views on and constraints governing the use of terms in their works. A comparative analysis reveals differences between the two paradigms in three aspects of nomenclature: the principles of nomenclature, the conception of the nature of nomenclature, and the community’s acceptance and promotion of it. Regarding principles of nomenclature, Priestley centered his classification around air, distinguishing types of air and expounding the transfer of phlogiston within them. Lavoisier, began by distinguishing the “elements of bodies,” then centered his classification around acids, categorizing metallic, non-metallic, and earthy substances, and expounding the characteristic reactions of substances with acids. Regarding their conception of the nature of nomenclature, Priestley viewed terms as products of experiment and theory, emphasizing their modification based on new discoveries. Lavoisier, influenced by Condillac, saw nomenclature as a method, asserting that it could identify research gaps within the field and thereby guide chemical discovery. Regarding the promotion and acceptance of nomenclature, Priestley’s paradigm had no inherent need for terminological uniformity. In contrast, Lavoisier and his supporters actively

employed methods such as lobbying and public exhibitions to establish the authority of their nomenclature.

From these three points, I argue that nomenclature in science serves not only to describe findings but, more profoundly, determines the methodology and presuppositions of science in the future.

A Naturalistic theory of Peircian Semiotics

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A central problem for philosophers seeking to naturalize meaning is providing a naturalistic explanation for the normativity of representation. Teleosemantics addresses this through the selected effect notion of biological function. Representation as a kind of function has been determined by its history. A key difficulty with this theory is that it explains the effect of a biological trait or item produced in the past, while the effect itself is present. In reality, the historical context imposes constraints on the possible effects a trait or item can produce. According to Peircean semiotics, interpretation determines the function of a sign. Deacon's toy model of autogenesis exemplifies the origin of a minimal interpretive system from which operational interpretation emerges. This explains the normativity of representation.

A Peirce–Baldwin Insight into Smolin's Cosmological Evolution

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Peirce's "dangerous idea" was that laws are habits (orders) that evolve. I link Peirce's tychism (absolute chance) and habit-taking tendencies to Smolin's temporal naturalism in Cosmological Natural Selection (CNS), where universes reproduce and laws change in time. Peirce supplies the logic of discovery, or abduction guided by normative economy of science, while CNS provides the evolutionary channel by which habits become cosmic laws. In a Baldwinian cosmological evolution, selection operates not primarily on specific constants but on meta-traits of universes that enhance habit-plasticity, or the capacity to "learn" stable regularities through structure formation and complexity. Learned regularities are then canalised as effective laws in descendant universes via black-hole reproduction. This predicts drift toward parameter regimes that maximise both fecundity and learnability. Empirical touchpoints include indications of evolving dark energy, complexity and black-hole abundance correlations, neutron-star mass bounds, BAO/CMB constraints, and precision clock tests, suggesting Peirce's framework to underwrite a testable, temporally naturalistic cosmology.