Episode 166 - The Lucretius Today Podcast Interviews Dr. David Glidden on "Epicurean Prolepsis"

Post by “HsiehKW” of July 24, 2023 at 11:49 PM

Joshua, here's my contemporary take on prolepsis and cognitive "errors". I think we have similar lines of reasoning, specifically: (1) how we define 'wrong' matters a lot; and (2) your definition of prolepsis as inference. So, let me start with how I see prolepsis as Anticipations in two nested senses.

In DeWitt, prolepsis is the "anticipatory notion of the essential attributes of the subject of examination (p. 148)." They are Nature's way of preconditioning an animal, preparing it for "life in the prospective environment (DeWitt, p. 146)." And it is a materialist (naturalist) concept being a "philosophical antonym of Plato's anamnesis or recollection (DeWitt, p. 146)." So, to me, it looks like the ancient analog of cognitive modules or psychological adaptations. Roughly, the reasoning behind these modern concepts is that just like physiology is selected by evolution, so are our cognitive faculties -- furnishing organisms with effective propensities for adaptive behavior.

But, in DeWitt, Anticipations too it looks like can be built through experience. He stated that for Epicurus:

> Quote
>
> "The innate capacity to distinguish colors is an anticipation of experience no less than the innate capacity to distinguish between justice and injustice. The difference is that the color-sense is part of the individual's preconditioning for life in his physical environment and emerges in early childhood, while the sense of justice is part of the preconditioning for life in the social environment and emerges later, ***developing in pace with experience, instruction, and reflection*** [emphasis added](DeWitt, p. 142-143) ."

So, it seems that while a cognitive agent is furnished with Anticipations by its evolutionary history, these Anticipations also undergo development through an agent's ontogeny, throughout its lifespan. I, for now, read Anticipations this way: they are nested preconditions for future action generation (e.g., thinking, planning, mulling, etc.), selection, and control. At its very base, Anticipations are shaped by evolutionary selection but the agent (with agency) can have a hand in shaping them through experience. In this sense, they are evolving priors for decision-making. And they can be updated through experience analogous to Bayesian

Inference. As such, I'd like to think that Anticipations are in two nested senses: (a) *evolutionary adaptations in physiology* and (b) *psychological adaptations continuously developed in ontogeny*. This is where I am at. And the question of whether "prolepsis can lie" can be (and should be) approached from these two angles, if my reading is correct. I think you share the same notion too considering your two examples (i.e., heliotropism and snake/stick identification).

In prolepsis as (a) evolutionary adaptations, I think you hit the mark by bringing up that (1) how we might define 'wrong' has a lot to do with it. One particular example has come to mind: von Uexküll's tick. Loosely, the female tick is basically sensitized to three things: light, butyric acid, and temperature. After getting pregnant, it is driven by its prolepsis to light so it climbs up to a higher spot in the woods. She stays clung until she "smells" or detects butyric acid emanating from a mammal. Butyric acid is its cue to let go and drop "in the hopes of" landing on a warm-blooded mammal to feed. If the animal is missed, she makes her way back up following the light, doing it all over again. If she succeeds, then its prolepsis for temperature drives her to find a warm bald spot to take her last meal, blood. All she has to do then is drop, lay eggs, and die. These Anticipations or (a) evolutionary adaptations allow her to reproduce, evolutionary-successful so to speak. But these Anticipations only work in selected niches. In the lab, the tick can be tricked to drink any fluid from perforated artificial membranes provided they are at the right temperature. So, is prolepsis wrong? I don't think so if we stick to DeWitt's interpretation, prolepsis as the "anticipatory notion of the essential attributes of the subject of examination (p. 148)." In the tick's case, the essential attributes of biological/evolutionary significance are light, butyric acid, and temperature. And she rightly identified and acted on those in her "life in the prospective environment (DeWitt, p. 146)." The prospective environment is key here in judging whether prolepsis, as (a) evolutionary adaptations, are effective or not. And looking at this "algorithmic" process, it works in the most likely contexts where a tick would find itself. If we think of it in a probabilistic way, the tick is perfectly equipped by Nature. However, I think that prolepsis can lead to mistakes when applied/manifested in the 'wrong' context. The tick in the lab and Platonists are prime examples.

Kidding aside, it seems that we can sidestep the concern for correctness conditions of (a) evolutionary adaptations by recognizing them as enablers or embodied adaptive faculties, demarcating them from perception and action (i.e., inferences). As they are embodied in cognitive agents like the network of veins in the embryo that prefigures the adult organism (see DeWitt, p. 147), they are real entities. And real entities like organs and trees cannot be true or false, right or wrong. This is much like Sensations, which to me are evolutionary adaptations. Sensations are not true or false as if they are logical propositions like "P(x) is true" or "P(x) is false". They are true in the way that they are real goings-on in an agent embedded in the world that produces subjective phenomenal experience with certain qualities, as brute experiential facts. How they are used, however, can lead to mistakes. The error lies not in Sensations themselves but in "the hasty action of the automatic mind. For example, the boat on which the observer is a passenger is standing still but it seems to be moving when a second boat is passing by. In such an instance the eyes are not playing the observer false; it is the hasty

judgment of the automatic mind that is in error (DeWitt, p.137)." Cognitive errors occur in interpretations of Sensations, interpretations that can come in the form of logical propositions that may be true or false. So, to sidestep the question of whether prolepsis can be right or wrong, we must demarcate them from inferences.

I think it is best to keep in mind that evolutionary adaptations are, first and foremost, there to deal with matters of biological significance. So, this is what they are preconditioned to do, not solve differential equations. The acid test for how evolutionary adaptations are successful is not in higher-order inferences but in keeping oneself intact under precarious conditions. As such, they should be judged this way, as sort of like "tools" (not the best analogy, I suppose) with proper domains of use. The error lies in the results of using such "tools" in an actual domain that they are not "designed" for, as we see with von Uexküll's tick (see Sperber & Hirschfeld, 2004 for proper and actual domains of cognition modules).

While this "washing of our hands of something" or demarcation strategy may work for Anticipations as (a) evolutionary adaptations in physiology, I think it is not as strong when applied to the nested level of (b) psychological adaptations. This is because it involves perception and action in short-term action contexts that correctness conditions may apply, especially in the subjective experiential world of an agent (e.g., your snake/stick example). I think you have the right idea, however, in salvaging a sense of prolepsis as an effective epistemic enabler in the short-term scale of particular action contexts which again looks to sidestep the question of whether they are right or wrong. And that "trick" is to view prolepsis as an *ongoing inferential process,* not a static and discrete mental representation of a somewhat Platonic kind, and judge it on its merits in this regard -- primarily for its ability to effectively precondition cognitive "life in the prospective environment (DeWitt, p. 146)" or in a niche close to the environment of evolutionary adaptedness (EEA) that shaped or endowed us with Anticipations in the first place.

I guess the key here is to view short-term prolepsis in action contexts in faster timescales as an enabling process for inferences. It's the engine, so to speak; not the helmsman. It enables inferences of different kinds and it comes in different species-specific kinds, cognitive structures embodied in physiology, as endowed by Nature. So, in this line of thinking, we might be able to sidestep the issue once again. We can also supplement this by considering short-term prolepsis as error minimization, something that your (2) definition of prolepsis implies. Doing so would give prolepsis a corrective trajectory toward effective knowing of the environment and one's place in it, building what enactivists may call skillful know-how. That said, the argument may become clearer and stronger when we parse and interpret your definition in light of a contemporary framework.

You wrote that:

> Quote

> "I might define prolepsis--sensation->pattern->response--as an "anticipation made noncognitively in advance of ***more complete information*** [emphasis added]". It's certainly true that the stimulus whose pattern we recognize will very often turn out to be caused by something else. A stick, not a snake. A feather, not a fly. A fructose molecule, not a dangerous microbe."

I can't help but connect this to Free Energy Principle (FEP) or Active Inference (ActInf), a contemporary framework that is quite en vogue in CogSci circles. You may have heard of it here and there. The main purport here is that cognition is an inferential process where actions and perceptions are dovetailed together, hence called active inference or action-perception loops. The framework is quite eclectic, drawing inspiration for the study of cognition from various disciplines, from physics to machine learning and from neuroscience to embodied approaches among others. There is much enthusiasm surrounding FEP with many thinking (and hoping) that it is the "one ring to rule them all" in reference to cognitive theories. In case you want to read more about it, I will add the quintessential book on it in this folder: Cognitive Science & Canonics.

In a nutshell, ActInf or FEP is an abstract way of thinking about and formally (mathematically) modeling how cognitive agents learn through perceiving and acting continuously on continuous sensory input to learn about the world and their place in it. Roughly, at the very basic biological level, for an agent to stay alive or keep within the bounds of existence, it must infer the hidden external states that cause its sensations and act in a way to change the next influx of sensations to conform to their expectations; expectations that are, first and foremost, biologically significant (e.g., organisms strive to meet their expectations of staying alive) and can be read as Anticipations in the (a) evolutionary and (b) psychological senses. As such, the ActInf scheme can be thought of as error minimization between an internal model (expectations) and the hidden states it models. This is where errors can be minimized in two ways: change your mind or change the world. Failing to minimize such errors so can be a matter of life and death (e.g., determining whether what is nearby is a poisonous snake or simply a stick). Or it can be as trivial as fishing for your TV remote inside your couch (i.e., thinking that the remote is in this crevice or that while actively engaging the couch by touch to confirm until your expectation is met). But the scheme remains the same, something like: "sensation->pattern->response" as you said. Only this time, it is in a loop of course corrective behavior.

What this implies is that "errors" can occur as agents move from one state to another toward their goal states. In fact, they happen all the time. Cognitive agents, however, have built-in capabilities for course correction. We can see this in von Uexküll's tick actively sampling the world to fulfill its expectations on its way to lay her eggs. Recall that if she did not successfully land on the animal that emitted butyric acid, she acts in a way again to correct her "error" -- fulfilling her expectations, as she goes about her business. That said, in judging these capabilities or Anticipations, I think it's better to judge their effectiveness, not the number of

errors that happen all the time on an agent's way toward effectively navigating itself in its environment, particularly in its prospective niche similar to its EEA. And as the planet is teeming with cognitive agents, I think Nature has done pretty well.

Each organism is endowed with Anticipations, the propensities for action policy generation, selection, and control that are flexible and plastic enough to allow successful cognition in a wide array of contexts that can even stray from the EEA (see spandrels and phenotypic plasticity). And this is the minimum kind that can be further built further and elaborated in experience. But at the core, I believe, they conform to the Epicurean insight on Pleasure and Pain -- the drivers for effective behaviors, occupying the highest priority of attention. I find it unimaginable for a cognitive agent to be biologically successful without such faculties, however rudimentary or complex they are for "lower-order" and "higher-order" organisms, respectively. So, Nature has done a good job. It is up to cognitive agents to use their agency over such faculties for their own good. I think this thinking can fairly sidestep the question of whether prolepsis can lie. Is this close to what you had in mind?

P.S.

While I pretty much resonate with your thinking, I wouldn't go as far as to call plants cognitive agents (not sure if you do). They may have as you would call them primitive prolepsis or the Anticipations of the (a) evolutionary adaptive order, but as far as we know, they wouldn't experience sensations and feelings that can be used for agentic decision-making -- no Anticipations in the (b) psychological adaptive order. While I do accept that there's continuity between life and mind (i.e., mind is life-like and life is mind-like), the specificity of the cognitive, I believe, lies in a higher form of autonomy/agency at the level of a nervous system. As far as we know, plants do not have them. This opens a whole can of philosophical worms (i.e., the debate on the "life = mind" thesis) but in case you want some good reasons for this stance, you can refer to Barandiaran (2016/2017).

Cheers!