

## Sign, Sign, Everywhere a Sign!

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For Millikan, purpose pervades the biological order, including the genes and genetically encoded traits of every living thing, the unconditioned reflexes and conditioned behavior of every animal, artifacts produced by humans or non-humans. There are also the conscious, explicit purposes and intentions of human beings. These are purposes in “a quite univocal sense,” Millikan insists. “In all cases,” she says, “the thing’s purpose is ... *what it was selected for doing*.” Moreover, “...the purposes we attribute to whole persons ... are composed of no more than the purposes of [their] parts and aspects, and of the ways these have been designed to work together.” (13) The chain of purposes forms a double helix with another great chain -- the great chain of signs. At the bottom of the great chain, sit locally recurrent natural signs. These are wholly natural occurrences or states of affairs that carry “local information.” Locally recurrent natural signs are not yet *intentional* signs but they are the ground on which intentionality ultimately rests. Local natural signs are “basic” representations in the following sense:

... when the systems that produce and/or use intentional representations perform the tasks they were designed to perform and perform these tasks by means of their normal mechanism ... then the intentional representations are basic representations. (69)

When an intentional sign producing/consuming system is functioning “normally” its intentional signs will just be local natural signs. Systems don’t always function normally; So we can’t quite say that intentional signs are built out of locally recurrent natural signs. Still, without such signs subsisting at the ground level, there apparently could not be intentional signs.

But it is far from clear whether locally recurrent natural sign can really carry the load Millikan needs them to carry. Locality seems designed to exorcise the ghost of disjunction that haunts many correlational theories of content. Dretske, for example, wants to ground sign-signified relations in exceptionless natural laws. But Millikan insists that signs would then would have contents too disjunctive or abstract to satisfy the informational needs of sign-consuming creatures:

Consider a rabbit that *needs to know when a predator is near*. (emphasis added) However she detects a predator, no natural law can require it to *be* a predator that causes her predator detectors to fire. Whatever information channel she uses, it is always nomically possible that non-predators should exist who would activate it.

This would be a bad thing for the rabbit. A sign correlated with predators and non-predators alike would apparently be of no use to it. Nature's trick on behalf of the rabbit is to restrict the relevant sign to a domain in which it is statistically correlated with predators.

It bears stressing that exorcising disjunction in this way though a step toward intentionality is not yet to vouchsafe intentionality. Local natural signs are still *replete* with informational content. Local natural signs carry information not just about the state of some "distal" state of affairs, but also information about every step along the channel connecting sign to signified. Intentional signs, by contrast have more *sparse* informational contents.

Now Millikan insists that although non-nomic, the local correlations that establish sign-signified relations are not merely *accidental*. Sign-signified relations rest on correlations defined relative to "natural reference classes." A natural reference class "is a domain within which the correlations of *As* with *Bs* extends from one part of the domain to other parts for a reason." (40) It must also be possible, she insists, for an organism to track the relevant domain. If there were no natural reference classes, there would be no explanation of "...why a person might be able to use the recurrent sign as an indicator of its signified with some success." (38)

These last remarks suggest that facts about sign-consuming creatures themselves enforce locality upon signs. Why exactly do certain detectors in the rabbit count as *predator* detectors, rather than as detectors of something more disjunctive with which they are better nomically correlated? The answer would seem to depend on the role these detectors play, or have historically played, in enabling rabbits to avoid their predators. Playing that very role apparently explains the proliferation and reproduction of those very detectors. Perhaps, then, locality isn't so much an *antecedent* property of the signs that get eventually consumed by sign-consuming creatures, but a *product* of the consumption of signs that are neither antecedently nor intrinsically local. Signs *function as local* to the extent there are creatures around who are designed to use them that way. What might motivate this way of thinking is the assumption that the conditions that explain the success of sign using creatures more or less directly determine the contents of any natural signs that are instrumental to that success. If that is right, locality is not so much an antecedent and independent feature of signs. For it appears to take "purpose" and thus, presumably, the work of selection to render signs "local" rather than global.

This way of thinking begs a crucial question. Only local signs can render the success of a sign using creature non-accidental. But the success of an organism may be the product of the interaction of many factors. There will often be a variety of competing ways to divide the labor among the interacting factors in explaining that success. Putative contents of any signs that figure in the explanation of that success may differ depending on how the labor is divided among the contributing factors.

Consider the "high content" explanation of the contribution of the frog's sign use to the success of the frog's fly-directed snapping behavior. High content says that selection has recruited a certain indicator as the controller of the frog's fly directed snapping because the recruited indicator is (or was) a reliable indicator of flyish things, and not because it is (or was) a reliable indicator of small dark moving things. Being controlled by a reliable enough indicator of flyish things partly explains, according to the high content approach, why the frog's fly-directed snapping culminates often enough in

the ingestion of a fly. Since it is ingesting flies that matters to the frog and since the indicator's property of indicating flyish things helps to explain why behavior controlled by that indicator leads reliably and non-accidentally to the ingestion of flies, the indicator will come to have the "purpose" of indicating flyish things to the frog, but not the "purpose" of indicating small dark moving things. Indicating flies and not small dark moving things is what the indicator did that caused or enabled it to be recruited to control the frog's fly-directed snapping. Even if the recruited indicator remains, post recruitment, a more reliable indicator of small dark moving things than of flies, when considered globally, the indicator in some sense functions as carrier of local information about flies rather than a carrier of global information about small dark moving things.

Contrast high content with low content. Low content says that the relevant indicator is recruited to control the frog's fly-directed behavior because: (a) it indicates small dark moving things -- flyish and non-flyish alike -- and (b) enough of the small dark moving things hereabouts are flies that snapping at them eventuates regularly enough for reproductive success in the ingestion of a fly. Low content explains the success of the frog's fly-directed behavior in two steps rather than one. Low content and high content embody different attitudes toward locality. Though Millikan appears to endorse locality and high content, it is hard to see what, if any, non-question begging principle she thinks decisively favors high content over low content. She seems firmly enough convinced that an organism's success at cognitively exploiting a sign for its "purposes" must be non-accidentally related, at least in what she calls normal conditions, to the "contents" of both the relevant sign and the relevant purpose. Call this Millikan's Harmony Assumption. Harmony leads Millikan to believe that if it's flies that the frog is "after," in the sense that it's capturing flies that matters to the "success" of the frog, then any sign that successfully drives at least "normal" "fly-directed" snapping will encode information about flies rather than information about little black dots, on pain of disharmony between "content" and "purpose."

Natural selection would seem not only to permit, but sometimes even to exploit disharmony. In the case of the foraging frog, natural selection "cares" only that frogs capture enough fly-shaped bundles of amino acids to vouchsafe the frog's reproductive success. It doesn't care *under what aspect* frogs capture such bundles. It matters not whether the frog snaps at the fly qua fly, qua amino acid bundle, qua little black moving dot or qua nothing at all. So just what, beyond mere stipulation, could license the harmony assumption? It is hard to see why, in principle, it should be *local* natural signs that play the role of "basic" representations in Millikan's version of teleosemantics.

Millikan does insist that the notion of a natural sign is an epistemic notion. There are natural signs only where certain connections in thought "correctly and non-accidentally track" dependencies in nature. But just which dependencies in nature must be tracked in thought? Millikan's answer seems to be that it's the dependencies that *matter* to would be consumers of such signs. But what does such "mattering" come to? Consider the lowly frog and its fly detectors. If fly-wards snaps were controlled by detectors that trucked in global information about "little black dots or flies or what have you" rather than in local information about flies as such, it would be at most a lucky accident, Millikan thinks, that the frog managed, reliably enough for reproductive success, to capture *flies* by snapping fly-ward. There is something to this thought. Compare a frog that forages where "snap-at-ables" are mostly flies to a frog that forages

where “snap-at-ables” are mostly non-flies. Mere environmental fortune, and nothing in the contents of the frogs snap-controlling detectors, would seem to differentiate the two frogs one from another.

Selection forbid, Millikan seems to think, that creatures and their signs should proliferate on the basis of mere environmental fortune! But why exactly should selection forbid such a thing? It *is* non-accidental that over the course of evolutionary time, creatures inhabit environments for which they are well adapted. That, however, does not forbid selection from plopping a frog armed only with a carrier of information too insensitive or too disjunctive to distinguish flies from arbitrary moving black dots down in an environment where enough of the moving black dots it happens across turn out to be fly shaped bundles of amino acids. A frog plopped down in such an environment might simply not need a more “localized” detector.

There could be such foragers and such environments. Imagine a creature that plausibly does have need of a black dot detector rather than a more dedicated fly detector. Perhaps many different edibles cross its path. These edibles have in common only that they cast dot shaped black shadows upon our creature’s detectors. Our creature is entirely insensitive to the differences among the shadow casting edibles and entirely indifferent to which of them it consumes. Flies are just one among the tasty morsels that buzz about. Even a fully intelligent designer might say to herself, “Why bother building in a dedicated fly detector, when a detector with a more disjunctive, less specific content will do?” Imagine our creature migrating, over evolutionary time, to an environment in which only or mostly flies cast such shadows and in which only or mostly flies function as food. Would we ipso facto conclude that therefore what were once mere little black dot detectors had become dedicated fly detectors? I think not. Selection need not “harmonize” content and purpose in order to make adaptation happen. By parity of reasoning, even if we grant that for actual frogs the whereabouts of little black dots *as such* is entirely irrelevant to the frog’s success, survival, and proliferation, we need not conclude that therefore it cannot be little black dots that the frog represent with their behavior driving representations. I conclude that Millikan’s appeal to *local* natural signs as base level representations enjoys all the benefits of theft over honest toil. There is simply nothing in unaided nature that enforces locality upon natural signs.

Now imagine a creature much more cognitively sophisticated than your swamp-variety frog. Its inner representational and discriminatory capacities are finer grained, more specifically “attuned” to the presence or absence of flies as such. It possesses the reflective capacity to wonder whether black dots moving across its visual field are good or bad *evidence* for the presence of flies. It seeks to develop better, more reliable evidence concerning the whereabouts of flies. It develops epistemic policies designed to give it ever better, ever deeper theories about flies and how to detect them. Such theories mediate far-reaching inferences from premises provided by the comparatively low level deliverances of its perceptual and sensory apparatus to conclusions about the presence or absence of flies. And such theories play this inference-mediating role even in the absence of direct perceptual contact with flies. For such a creature, I submit, we have good reason to say that its inner representations have become things of which we can confidently say that some of them stand for flies as such -- rather than, say, little black dots, or fly-shaped bundles of amino acids. And they may do so across the entire range of possible guises under which flies might present themselves to the frog’s cognitive and

sensory apparatus. That is, given the right sort of representational and cognitive innards, cognizing agents may indeed manage to enforce something akin to locality on the signs that they produce and consume. Locality so understood would not be an antecedent “mind-independent” property of signs that could serve as the basis of a naturalistic theory of intentionality. Nor can it be bought on the representational and psychological cheap, contrary to what Millikan’s approach seems to require.

I turn briefly to a different matter. Millikan believes that certain features of signs that one might mistakenly have taken to be peculiar to specifically linguistic intentional signs – compositionality, context-sensitivity, and singularity -- already exist, albeit in attenuated form, in signs much lower down on the great chain. This view is tied up with a second story about local natural signs. They are supposedly abstract pictures of what they signify. They are associated with “semantic mapping functions” that define “isomorphisms between the set of possible signs in a certain sign domain and the set of their possible signifieds.” Recurrent natural signs are “structured worldly occurrences or states of affairs” that signify other structured worldly occurrences or states of affairs. An approaching rain cloud, for example, has an “architecturally determined” natural significance. The cloud signifies the coming rain; the time of the approach signifies the time of the coming rain; and the location of the approach signifies the location of the coming rain. This does not mean that the various constituents of that event each have *independent* significance that compose to determine the significance of the whole. Only the structure as a whole has independent natural significance. The significance of each “constituent” is a merely derived significance that “exists only relative to the mapping of a *complete* sign to the *complete* signified, and relative to which it has been abstracted.” (50)

Something similar is supposed to hold of linguistic signs. Of course, linguistic signs are syntactically and semantically articulated in ways that non-linguistic signs typically are not. Indeed, linguistic sign types would seem to be characterizable as such only relationally, by reference to the specifically linguistic relations they bear one to another. A noun is just an expression that combines with expressions of other sorts to yield still further expressions of still further sorts. These linguistic relations bear no deep analogy to the part-whole relations that putatively obtain for recurrent natural signs. So it is unclear exactly what sort of illumination we are supposed to gain by considering linguistic compositionality with the architecture of natural signs. For Millikan, the answer is apparently that there is quite a bit to learn. She insists, for example, that qua *conventional* and *cooperative*, linguistic signs are not entirely unlike certain cooperative signaling systems that permeate the animal world. I grant that there is a merit in this thought. But that only takes one so far.

To her credit, Millikan does say a great deal about how sentences *differ* from the lower level signs. A “pushmi-pullyu” rabbit thump, for example, has a sort of combinatorial structure that defines a semantic mapping function. The rabbit thumps “Lo! Danger! Flee!” -- simultaneously *describing* danger and *directing* flight. The sentence “There is danger over there!” has a finely articulated syntactic structure, subject to a variety of transformations and operations that no thump can match. The sentence can be negated, made the antecedent of a conditional, conjoined, disjoined, and embedded with tractable and systematic semantic consequence. Thumps are subject to few, if any, similar transformations and operations. Given the acknowledged gulfs

between specifically linguistic and various lower level signs, what real illumination about the actual workings of linguistic signs can be gained by contrasting them with non-linguistic signs? Though Millikan offers a plethora of interesting examples of animal signs in action, often juxtaposed with intriguing observations about human language, thought and perception, I find myself at a loss in figuring out how, if at all, the observations about animal signs are supposed to support conclusions about human signs. So I close with an invitation to Millikan to clarify once more just what it is that bee signs have to teach about intensionality and what approaching rain clouds have to teach about the syntax, semantics and pragmatics of sentences like "It is about to rain in Palo Alto." I myself can think of very little.