Usage, Coordination, and the Modality of Ecological Information

Ecological psychology (EP) explains perceptual behaviour in terms of affordances—the opportunities for action offered by the environment—and ecological information—the sets of structures in the ambient array that allow the animal to engage with those opportunities. Since information is taken to *specify* affordances, EP claims that animals can directly perceive opportunities for action by picking up patterns in the optic array (Gibson, 2015; Michaels & Carello, 1981). There is, however, a live dispute over how *specificity* should be understood. One influential proposal is the *usage-based account*. Unlike the orthodox view (Turvey et al., 1981), it rejects the idea that specification consists in a nomological relation between ambient patterns and the perceived properties of the environment. On the usage-based view, specification is instead a *relational achievement* between ambient patterns and the animal's activities. What matters, in short, is how patterns of light, sound, and so on are *used* in goal-directed activity. Objects of perceptions are specified in use.

Despite having recently attracted more attention, this picture has raised a familiar objection (Segundo-Ortin et al., 2019; Carvalho & Rolla, 2020). The worry concerns whether the usage-based account can accommodate a truly *modal* conception of ecological information. The objection insists that the informational significance of an ambient pattern derives from what it *affords*—the possibilities for action it offers—rather than from what some particular agent happens to do with it at a particular moment. Consider, for instance, a torch whose vibration intensity varies with proximity to an object. The vibration pattern plausibly remains informative regardless of whether the agent is currently exploiting it. As this suggests, the property of being informative is not exhausted by an organism's actual, occurrent uses. However, by insisting that information derives from the *actual* use of an ambient pattern, the usage-based account seems unable to account for the very idea of an ambient pattern being us*able* or afford*able*, and not only for its being us*ed* and afford*ed*. Therefore, it seems we must appeal to something more than the mere use—such as a nomological relation of covariance—to explain the modal character of ecological information.

In this paper, I argue against this objection. The core mistake, I suggest, lies in an impoverished conception of the context of use in which an ambient pattern achieves its informational significance. My strategy is threefold. First, I show that the objection tacitly relies on an implausibly narrow understanding of the context of use. Second, I develop the notion of coordination as offering a more adequate account of such contexts—one that makes room for the counterfactual robustness the objection demands. Third, I clarify the corresponding notion of specification. As a result, a proper *modal view* of usage-based information will emerge.

To begin with, the objection treats information based on use as exhausted by the very circumstances in which an ambient pattern is actually exploited *here* and *now*. But this is highly implausible. Ordinary talk of information-use is already counterfactual in character: to say that a pattern is used to perform a certain action is, at least in part, to say that the same pattern would remain usable for that action across the relevant range of

circumstances, so long as certain background conditions obtain. If information is constituted in use, then the "context of use" cannot be identified with a single occurrent episode. Any adequate account must appeal to something that reaches beyond the particular situation in which the pattern is actually used. The objection's mistake is to take this requirement to be one the usage-based view cannot satisfy.

By contrast, I suggest that the notion of coordination provides a more illuminating picture of how information is constituted in use. Van Dijk & Kiverstein (2021) propose that ambient patterns become proper information insofar as they are used to achieve coordination with the environment. The crucial point is that coordination is not a momentary event, but a *practice*: it is not exhausted by any particular episode of successful engagement. Rather, it is essentially *future-oriented*. What unifies particular performances as instances of coordination is the agent's practical commitment to continue acting in certain ways under relevantly similar circumstances.

This future-oriented character helps explain how possible uses are grounded in actual and past uses. The claim is that the opportunity for action—i.e., the affordance—associated with an ambient pattern is a *projection* from the history of established uses of that pattern in coordination (see Goodman, 1983). In other words, although a given pattern may be compatible with many possible actions in virtue of its intrinsic features, which possibilities are projected depends on the organism's history of interaction with that pattern. Past success in coordination entrenches some projections rather than others. In this way, the history of actual use for coordination constrains which affordance is projectible from a given ambient pattern. The relevant "context of use" that fixes informational significance is therefore not a momentary situation, but the temporally extended, future-directed practice of coordination.

Once this is in place, the objection's conclusion no longer follows. If coordination is the proper context of use, then information based on use can specify opportunities for action while still being counterfactually supported. Specification supervenes on this dynamic of projection: it remains a relation between ambient patterns and the animal's activities; but those activities should not be identified with whatever the agent happens to be doing at a given moment. Specification is itself modal: grounded in a history of interactions with the pattern, an ambient structure can specify certain opportunities for action even when it is not currently being exploited. Specification can thus range across different spatiotemporal contexts without thereby ceasing to be determined by actual use.

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