



Beings in the moment

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<CT>**Beings in the moment**

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<C-AB> Abstract: Hoerl and McCormack’s theory defines temporal behavior from an awareness of time, but lacks one critical element: the impact of “psychological presence” in the “moment now.” Central to experience of temporal non-stationarity: “nowness” links future with past in the context of time flow. Does this differ between species? Evidence suggests not: different temporal experiences between species requires greater critical evaluation.

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Husserl (1917) and Bergson (1910) considered the experience “of time” to be related to experience “in time.” Within this conceptualization, the immediate present, the “moment now,” is a composite of future with the immediate past (Husserl 1917). Beyond this, real time, as in experience of an enduring and continuous flow of events from future toward the past, is not directly knowable, but may be judged through intuition arising from a series of acts of direct participation in immediate experience. This intuition Bergson (1910) referred to as “lived time,” and this describes a continuous experience of the moment now, influenced by its context of past events,

whilst influencing and perhaps influenced by the likelihood of events occurring in the future.

By these conceptualizations, the moment now is the nexus for past and future, with experience of “nowness” including both past and future events. Seminal scientific investigations of the “psychological moment” were undertaken in early schools of theoretical biology, such as that of von Uexküll (1928; 1934, translated as von Uexküll [1957]). From Uexküll’s school, experimental work was published in the 1930s, using near-identical experimental techniques to delimit the minimal psychological moment of various creatures: human beings, fighting fish, and snails (Brecher 1932). Whilst the duration, or “quantum” of the moment, differed across species, in all of the species studied, Brecher found that events separated by time might, given short intervals between their presentations, be combined to form a meaningful, co-existent experiential content in the now.

Although Brecher showed that both animals and humans could provide an estimate of the experience of present co-existence using similar experimental techniques, he also showed that this experience related to the “content” of the temporally separate, but experientially coincident events, at least for the fighting fish. These animals experienced repeated exposures to the image of a conspecific, viewed through slits cut at right angles to one another in a rapidly rotated disk. Above a certain exposure frequency (equivalent to around 30 Hz), the successive images fused to form a continuous image, at which point the fish attempted his attack. Two points can be taken for this example. First, insofar as psychological presence includes content provided by the fusion of temporally separated events, this content may be

meaningful. At least, and for creatures other than humans, past and present are meaningfully unified into an experience of nowness. The second point refers to Uexküll's concept of *Umwelt* or "meaningfully relevant aspects of the environment." Ultimately, *Umwelten* determine the sensory, perceptual, and subsequent physiological responses of the animal, and insofar as the moment is an index of basic cognitive capacity (i.e., the amount of information we can process in the smallest interval of psychological time), the complexity of Umwelt responses, and so Umwelt itself, determines a given species moment quantum.

This second point entails psychological presence to be equated not with the experience of time flow, but with the "content structure" of experience – in this case the meaningful content of a given moment. Consequently, and based upon representational states related to event structure in time, all animals should be considered the same because they should be considered to be located on the same experiential continuum. Uexküll was clear that whereas moments may be related to relevant aspects of the environment to which the animal responds, this in turn refers to the number of (coordinated) reflex arcs in the animal's behavioral repertoire. Uexküll rejected the reflex arc as sufficient to explain either the response or the cognitive organization underlying the response. In fact, this may be better conceived of as a form of capacity limit, which may be indexed by the duration, and therefore in the content, of the moment. Consequently, the moment, insofar as this links past and future, is determined by the meaningful interaction of the animal with its environment.

Therefore, and as a modification to Hoerl and McCormack, I propose temporal updating as insufficient to describe all common aspects of temporal experience across species. Instead, at least the meaning of events and the meaning of the response to those events link the past and present, at the most elementary level of temporal experience. To the best of my knowledge, there are no data to support an extension of this idea into the relationship between past, present, and future events, but it leaves this possibility open. Further, there is no evidence linking what occurs at the most elementary level of temporal experience to quanta in the hundreds of seconds or even second time ranges. However, the absence of data is not conclusive evidence, whereas, at least in humans, there is evidence that performance on time estimation tasks scale almost linearly with an exponent close to 0.9 (Eisler 1976). If humans and animals differ only with reference to the duration of their moments and what constitutes relevant experience in time, given identical operating characteristics in the brain, there is no reason to suspect any difference in the scaling function that describes their experience in time.

However, the issue raised by the representation of temporality in different species does not end with this point. Uexküll noted that some species, in this case the sea urchin, possess multiple independent reflex arc systems. This means these animals might experience multiple, but nonetheless, concurrent experiences of *Umwelten* in time. We tend to assume all temporality to be the same as our temporality, that is, a one-dimensional state in which events proceed, sometimes at varying rates, from future to past. However, this may not be the case. Additionally, and as argued earlier, across species, the qualitative content of *Umwelten*, as well as the timing of the moments within which they present, and the nervous systems within which they are

instantiated (their quantitative aspect) are different. Given we neither experience the world as animals do, nor are we able to experience multiple concurrent experiences of time, we may also be unable to conclusively define a model that adequately describes experience in time for any species except our own.

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