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► **To cite this version:**

Elisabeth Pacherie. Conscious experience and concept forming abilities. *Acta Analytica*, 2000, 26, pp. 45-52. <ijn_00000246>

HAL Id: ijn_00000246

https://jeannicod.ccsd.cnrs.fr/ijn_00000246

Submitted on 28 Oct 2002

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Pacherie, E. 2000. Conscious experience and concept forming abilities. *Acta Analytica*, 26: 45-52.

Conscious experience and concept-forming abilities

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Pierre Jacob's book, *What Minds Can Do*, is mainly concerned with intentionality. Jacob's primary goal is to explain both how it is possible for a physical system to have intentional mental states and how the intentional content of such mental states can play a role in the causal explanation of behaviour. Yet, he also tackles the issue of the nature of conscious experience. I shall focus here on a claim he makes in connection with this latter topic. The claim (made at the very end of Chapter 2, p. 77) is that in order to undergo states of consciousness a creature must have concept-forming abilities. At first sight, this contention seems implausibly strong. Although our intuitions in such matters may not be very reliable, I think many people would be willing to attribute to members of certain animal species a capacity to enjoy conscious experiences, while being reluctant to grant them concept forming abilities. The plausibility or implausibility of Jacob's claim depends in a large part on how one construes the notion of a conscious experience, as well as on what one considers concept-forming abilities to be. Since the topic of consciousness is rather peripheral in Jacob's book, the rejection of this claim would not directly affect his more central theses. Yet, examining it gives us an opportunity to scrutinize a distinction that plays a central role in Dretske's work and that Jacob endorses, namely, the distinction between analogical and digital coding of information. Since this distinction underlies in turn the distinction between sensory content and conceptual content and since the latter distinction is at the core of informational semantics, this discussion may have at least indirect implications for some other problems discussed by Jacob in his book.

Let me first recall the context in which the topic of consciousness arises in Jacob's book. Jacob advocates strong Representationalism, construed as the claim that the mind is primarily a representational system, or, to put it even more strongly as Dretske does, the claim that all mental facts are representational facts. However, two rather different types of states populate the human mind: propositional attitudes such as beliefs and desires, and qualitative states, conscious experiences, sensations or qualia, that have a subjective character and a characteristic qualitative feel. Although the representationalist

claim seems tailor-made for propositional attitudes, it is far from obvious that it is true of qualitative states.

The challenge then is to show that a theory of the semantic properties of propositional attitudes can throw light on conscious experiences as well. In order to get clearer as to where the problem lies, Jacob avails himself of two distinctions. The first distinction is between what Rosenthal (1986) calls 'creature consciousness' and 'state consciousness'. This distinction reflects the distinction between two uses, transitive and intransitive, that we make of the word conscious. The first, transitive, use corresponds to the application we make of the word conscious when we say of a being that it is conscious of something. It corresponds to what Rosenthal calls *creature* consciousness. This sense is to be distinguished from the use one makes of the word when one says of a state or process that it is conscious. This second use corresponds to what Rosenthal calls *state* consciousness and it is intransitive in the sense that saying of a state that it is conscious is not saying that the state is conscious of something. According to the higher-order thought theory of consciousness that Rosenthal advocates, the notion of state consciousness should be analysed in terms of the notion of creature consciousness. When we attribute consciousness to a state, an experience or a process, we are not, by the same token, attributing this state, experience or process an intrinsic property. The difference between a conscious and an unconscious experience (or state, or process) is not a difference in the experience, it is a difference in the experiencer (the owner of the state or process). A conscious state is a state a person whose state it is is conscious of in virtue of having formed a higher-order thought about it. The second distinction introduced by Jacob is Block's distinction between A-consciousness or access-consciousness and P-consciousness or phenomenal consciousness. A person's mental states are A-conscious if they are available to the person for use in reasoning and rationally guiding thought and action. A state is P-conscious if it has a phenomenal or sensory properties, if there is something it is like to be in that state.

According to Jacob, the Higher-Order Thought (HOT) theory of consciousness accounts nicely for the accessibility notion of state-consciousness: one of my beliefs is a conscious belief if I am conscious of it. Yet Jacob denies that the HOT theory also accounts for P-consciousness. He deems it implausible to require that only creatures able to form higher-order thoughts about lower-order sensory states can have states such that there is something it is like to be in those states. A sensory state, he claims, can be conscious in the sense of P-consciousness, without the person whose state it is having to form a higher-order thought about it. Those states are what Jacob calls states of consciousness: "Sensory states via which a person is creature-conscious of things and properties which are not conscious states in the higher-order sense I propose to call states of consciousness." (p. 62, n. 18)

Given these distinctions, the task of accounting for problems of consciousness in representationalist terms divides into two sub-tasks. First sub-task: use the HOT theory to throw light on the accessibility sense of consciousness; in other words, account for A-consciousness in terms of metarepresentational abilities. Second sub-task: use informational semantics to account for consciousness in the phenomenal sense; in other words, account for P-consciousness in terms of concept-forming abilities. I'll be concerned here with the second sub-task.

According to Jacob, together with many other philosophers (including myself), sensory states, which are the paradigmatic cases of P-conscious states, are states with non-conceptual content, whereas belief states are states with conceptual content. Thus, claiming that the having of P-conscious states requires concept-forming abilities amounts to claiming that it requires belief-forming abilities. Following Dretske, Jacob relies upon the distinction between analogical and digital encoding in order to account for the distinction between the non-conceptual content of experience and the conceptual content of a belief.

The difference between an analog and a digital encoding of information is traditionally thought of as a difference between a continuous and a discrete representation of some variable property. Dretske, however, makes a slightly unorthodox use of the distinction by using it not to distinguish between the various ways in which information about properties might be encoded, but to mark the different ways in which facts can be represented. Thus, according to Dretske's use of the terms, a signal (structure, event, or state) will be said to carry the information that s is F in digital form if and only if the signal carries no additional information about s , no information that is not already nested in s 's being F . If the signal does carry additional information about s , information that is not already nested in s 's being F , the signal will be said to carry this information in analog form. Information that t is G is said to be nested in s 's being F if and only if s 's being F carries the information that t is G . It should also be noted that every signal carries information in both analog and digital form. The most specific piece of information the signal carries (about s) is the only piece of information it carries (about s) in digital form; all other information (about s) is coded in analog form.

The contrast between analog and digital encoding of information is used by Dretske for distinguishing between sensory and cognitive processes. Dretske contends that the difference between our perceptual experience, the experience that constitutes our seeing and hearing things and the perceptual knowledge (or belief) that is normally consequent upon that experience is, fundamentally, a coding difference. Sensory perception is the process by means of which information is delivered within a richer matrix of information (hence in analog form) to the cognitive centers for their selective

use. Cognitive activity, on the other hand, is the conceptual mobilization of incoming information, and this conceptual treatment is fundamentally a matter of ignoring differences, of abstracting, classifying, generalizing, hence a matter of analog to digital conversion. In this respect the relation between sensory processes and cognitive processes is like the relation of a preliminary analog representation to a subsequent digital representation.

In *Knowledge and the flow of information* (1981), Dretske distinguishes between the informational content of a state and its semantic content, where the informational content of a state is all the information it carries and its semantic content the information it carries in digital form. One might be tempted to equate the non-conceptual content of a sensory state with the content it encodes in analogical form, hence its informational content. And Jacob seems ready to endorse this move, when he says (p. 75): "If the sensory content of a sensory experience is non-conceptual content and non-conceptual content is information analogically coded, then there will be no room for a notion of a maximally specific sensory experience." and then adds: "I think an informational semanticist can embrace this conclusion and live with it". As for me, I think this move should be resisted if we want to preserve the idea that sensory states are representational states, states with correctness conditions as Peacocke (1992) would say. Informational states cannot be equated with sensory representational states, since it is an essential feature of representational states that they may be false or incorrect.

The problem of accounting for this feature of representations is what is ordinarily called the problem of misrepresentations. According to Jacob, we should in fact distinguish two problems, the problem of imperfect correlations, which is a disjunction problem, and the problem of transitivity which is a problem of indeterminacy. Jacob further contends that the first problem has an informational solution, whereas the latter requires a teleological solution. In his last two books (1988, 1995) Dretske advocates a mixed approach to representations: an informationally-based teleological approach. The distinction between the informational and the semantic contents of a state is replaced by the distinction between what a state indicates and what it is its function to indicate. For states to be sensory representations and not just informational states, it is necessary that they have a function of indicating. This point is acknowledged by Dretske in *Naturalizing the Mind* (1995), where he draws the distinction between sensory representations and conceptual representations, not in terms of analogical versus digital encoding of information, but in terms of a distinction between systemic and acquired indicator functions. Dretske proposes that we identify perceptual states as states whose representational properties are systemic where a state is said to have a systemic indicator function in case it derives its function from the system of which it is a state. Such indicator functions are conceived as phylogenetically determined and hence fixed. By

contrast, thoughts and conceptual representations in general are identified with states whose representational properties are acquired, where a state is said to have an acquired indicator function, if it derives its indicator function not from the system of which it is a state, but from the type of state of which it is a token. Those indicator functions are ontologically determined, not phylogenetically determined, and, through learning, they can change.

If we adopt this view, we cannot say that what distinguishes non-conceptual content from conceptual content is that non-conceptual content is information analogically coded, at least in the sense of analogical used by Dretske. The content of both sensory and conceptual states is the information it is their function to carry. There is no reason to say that this information is carried in analogical form in the case of sensory states and in digital form in the case of conceptual states. If we want to keep talking of analogical vs. digital encoding of information, we should rather say that in both cases the representational content of the states is encoded in digital form, the information nested in the information that is represented may then be said to be analogically coded. But then both conceptual and non-conceptual representations may be said to encode information both in digital and in analogical ways. The thought '*a* is square' encodes digitally hence represents the fact that *a* is square, it also encodes analogically but does not represent the fact that *a* is rectangular. If we borrow Peacocke's notion of a scenario content, we may say that my present visual experience encodes digitally hence represents the way in which the space around me is filled out. If the object *a* that is square happens to be in front of me, we may say that my sensory representation also encodes analogically the fact that *a* is square, but it is not a sensory representation of the fact that *a* is square.

From this picture, it follows that the distinction between sensory representations and conceptual representations cannot be based on the distinction between analogical and digital encoding of information in Dretske's sense. What is true is that sensory representations have a richer and much more specific representational content than conceptual representations and that, as a consequence, they also encode analogically more information than conceptual representations, since the richer the representational content of a state, the greater the amount of information nested in it. But the representational content of sensory states is not information analogically coded.

Jacob's requirement that a system should not be granted states of consciousness unless it have concept-forming abilities stems, I think, from two worries. The first worry is that unless we impose such a requirement, we would have no reason not to grant conscious experiences to physical systems capable of receiving and encoding information analogically without being able to digitalize it. I think it is easy to alleviate this worry once we make a distinction between information-carrying states that carry

information analogically and sensory states. What makes a state a sensory state, a state with non-conceptual content, is not the fact that it carries information encoded analogically, it is the fact that it has a certain systemic indicator function. As a result, sensory states have representational content and not just informational content. The difference between sensory states and physical systems such as thermostats is that sensory states have natural indicator functions, whereas thermostats don't. When a physical device such as a thermostat has an indicator function, it owes it to the intentions or purposes of external designers. Its indicator function is conventional, not natural. If this worry was the only one, it would be enough, in order to alleviate it, to replace Jacob's requirement with the weaker requirement that to undergo states of consciousness, a creature must have states with natural indicator functions.

However, there is a second worry, well expressed by Evans (1982), and echoed by Jacob. The idea is that not until some information can "serve as the input to a thinking, concept-applying, and reasoning system", can a person be said to undergo an experience as opposed to some part of his or her brain receiving and processing the information. In other words, we still need to distinguish between a representational state that is merely present *in* an organism and a representational state that is present *for* the organism. If we consider, for instance, Marr's theory of vision (Marr, 1982), we would not want to say that the primal sketch is a state of consciousness, not because it is not a representational state, but because the information contained in this state is not available to the system as a whole for further elaboration and use in the control and regulation of behavior. The problem here is that of availability to the system as a whole. So when Jacob requires that "a sensory state — a state encoding information analogically — must serve as a possible input to a concept-forming ability for it to count as a conscious experience" (p. 77), I gather that what he wants to insure is that the sensory state be present *for* the organism and not just *in* the organism. Two assumptions, I think, underlie this requirement. The first is that only digitalized information can be exploited by organisms in order to control and regulate their behavior. The second is that sensory states encode information analogically and not digitally. As I argued earlier, the second assumption should be rejected. Sensory states have non-conceptual semantic properties, they are not just information carriers. As a consequence, there is no reason to deny that sensory representations may in certain cases be used *telles quelles* in the steering of behavior. If an organism's sensory representations are well adapted to his needs, there is no reason to require that they always be recalibrated or further digitalized before being put to use by the organism.

The requirement that sensory representations serve as possible inputs to a concept-forming capacity presumably ensures that they are present for the organism and not just to the organism. Thus, this requirement may be taken as a sufficient condition for

availability to the system as a whole, but I doubt that it is a necessary condition. There may be other means to insure this availability. The architecture of a system may provide for an interface between sensory states, motivations, and behaviour, without concepts being needed to act as go-betweens. Therefore, I think we should relax Jacob's requirement and say instead that to undergo states of consciousness, a creature must have states with natural indicator functions and the information supplied by those states must be available to the creature for use in the control and regulation of behavior.

I think this weaker requirement meshes rather well with some of the views Jacob says defends later in the book. In chapter 8 (p. 261), in particular, Jacob advocates a threefold distinction between instinctive non-intentional behavior, intentional non-voluntary behavior and intentional voluntary behavior, where instinctive non-intentional behavior is not produced by representations, intentional non-voluntary is produced by innate, including sensory, representations, and intentional voluntary behavior is produced by beliefs. I see no reason why we should deny states of consciousness to creatures capable of intentional non-voluntary behavior (but not intentional voluntary behavior) by contrast with creatures capable only of instinctive non-intentional behavior.

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