

## Distinguishing Perceptual from Conceptual Categories

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### I

The area between sensation and conceptualization is gray and confusing. Despite abundant philosophical and empirical research, results about how to understand this area that command widespread assent are very scarce. One contributory source to this impasse is the fact that, for mature and intact humans, the sensory, the perceptual, and the conceptual seem merged in consciousness. Perception is phenomenally so "cognitively penetrable" - so infused for humans by discursive understanding - that experimental and theoretical efforts to distinguish between it and conceptualization, and consequently between it and sensation, often seem constrained only by whatever favored theory drives the effort. In what follows, I consider reasons for distinguishing perceptual from conceptual categories and suggest a way of making the distinction. First, however, some preliminaries will help make clearer just what topic is under discussion.

### II

Another approach to the problem of my concern can be made through the Wittgensteinian problematic: Is all seeing, seeing as; and, more generally, does all perceiving require interpretation? On the account suggested by the considerations I shall make, both questions are obscure; the notions of seeing as and interpretation that are engaged by them fail to distinguish

between non-conceptual categorization and conceptualization. It may be that all visual perception requires categorization, even though not all categorization is conceptual. This failure is symptomatic of widespread unclarity about how to understand the differences among sensation, perception, and conceptualization.

Sometimes the Wittgensteinian problematic is taken as inviting an account of "seeing an aspect", where this is understood as equivalent to an account of seeing something "under an aspect". Recent discussions of "perceptual content", for example, of the perceptual content motivating frogs's leaps at flies, suggest this interpretation. Talk about perceptual content, as of mental content in general, invokes the metaphor of mind as container, standardly, as container of information, and directs one to provide a discursive account of the purported content. To give such an account, however, of

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what is presumed to be phenomenal "content" how it seems to the frog for example is to engage in conceptualizing that content, and from the frog's point of view as it were. But this is to suppose that it is the frog, and not we, who conceptualizes this content, a suggestion that can hardly be supposed transparently true, however compatible with some favored metatheory it may be.

Considerations like this one recommend that casting questions about differences between perception and conception in terms of mental content be avoided, whenever it is possible to do so. For it may be natural to suppose that the frog perceives, but not natural, absent more compelling evidence, to suppose that it conceptualizes that which it perceives. In general, whether or not it turns out that the ability to conceptualize is in fact dependent upon having a public language (I cannot imagine that it is not), one is on safer ground to limit clear examples of

conceptualization to creatures who manifest their conceptualizations in explicit judgments.

### III

Several sets of circumstances conspire to obscure the differences between perceptual and conceptual categories. Here is one such set.

Normally we distinguish between sensation and perception in complex and multifunctional organisms according as the response that is evidence for either is a local response by some part of the organism or a general response of the whole organism. Such reflex responses as withdrawing the hand from a hot object are clear examples of the former while fleeing from a predator is normally an example of the latter. A response that is a general response of a whole complex organism, and thus evidence of perception, requires for its explanation some reference to central processing by the organism because a complex organism is presumed to require some way of coordinating its various parts in order to make a whole-organism response. There is, thus, the following dilemma: In humans, the *best* evidence for categorization is linguistic evidence, what category the subject says an object belongs to. But in non-language-using species, the only evidence that categorization has occurred is the occurrence of a non-linguistic, whole-organism response. So, either one makes the *ad hoc* decision to count only linguistic evidence as acceptable evidence of categorization, treating all categorization as conceptual, or one treats perceptual and conceptual categories as substantially equivalent. To take the first course seems to prejudice the investigation in favor of humans, supposing perhaps gratuitously that only humans could enjoy the privilege of categorization. But to take the second course seems to prejudice the investigation against humans, supposing perhaps gratuitously that language is, after all, merely an efficient technology for communicating information that is intrinsically language-independent. In either case, perception and conception are conflated.

Perception and conception are conflated, in particular, whenever it is supposed that if there is a general, whole-organism response, then a general-

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ization that "sends" as it were, appropriate information to each part of the organism involved in the response constitutes a judgment about the character of the stimulus. For, in this way, judgment - construed as generalization is projected onto pattern recognition and perception. Categorization is thus construed as conceptualization and taken to be a single central function of an organism in which distinguishable stimuli are understood and responded to as if they were identical. In one example of this conflation Miller and Johnson-Laird (1976), studying perception and language, discount any developmental distinction between a response and an assertion on grounds that there is no evidence that such a development occurs. Consequently, they build judgment into perception itself, dispensing with any need to account for assertion as a distinct cognitive practice. But what would count as evidence of such a developmental difference in the course of language acquisition? Certainly, anything that is a response, linguistic or non-linguistic, is categorial in as much as it is a whole-organism response to some generalized perception, one, that is, which involves pattern recognition by the organism as a whole, and, thus, also involves central processing. Nevertheless, there may be a difference between perceptual categorization and conceptual categorization that is discounted if all evidence of categorization is taken as evidence of conceptualization.

Another example of the tendency to conflate perceptual and conceptual categorization is suggested by Medin and Barsalou's comparative study, "Categorization Processes and Categorical Perception" (1987). They begin this review of experimental data on categorization presuming a distinction between "sensory perception" (SP) categories and "general knowledge"

(GK) categories and identifying general knowledge categories with (linguistic) semantic categories; thus, they begin by assuming that perceptual and conceptual categorization are different phenomena. They propose to compare the two types because most empirical research has been on one or the other, but not both. The conclusion of their comparison, however, seems to bring them close to conflating perceptual and conceptual categories. For the conclusion of their comparison is that there are "deep similarities" between SP and GK categories, and they urge further study at this intersection. They thus end by suggesting that the distinction with which they had begun may not be a clear one after all.

A second set of circumstances encourages the conflation of sensation and perception. While most philosophers are careful not to conflate perception and conception, a favored route for marking this difference is to distinguish between sensory-perception and conceptualization as between analog and digital representations. Such an account, however, may conflate sensation and perception, and, indeed, seems to foreclose on acknowledging perceptual categories by assimilating perception to sensation.

Stephen Palmer's work on representation theory (1978) raises specific objections to carefree assignment of analog and digital properties to alleged representations. Palmer argues that the two types of representation, ana-

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log and what he there calls "propositional", are informationally equivalent as representations and differ rather in their inherent structures as representations. Because of their informational equivalence, he claims that any controversy concerning whether a (type of) mental representation is analog or propositional cannot be resolved without physiological psychologists "looking inside the head" (p. 298). Palmer claims that manifested behavior can reveal only what information a

subject has but does not reveal the form in which the information is stored. He maintains that cognitive psychology is concerned only with matters at "the level of abstraction defined by informationally equivalent systems" (p.277).

Palmer distinguishes between analog and propositional representations according to whether a representation is intrinsically or extrinsically related to what it represents. In his example, to represent the distribution of ages in a population by rectangular columns of different heights would be to use an intrinsic representation, since the columns represent ages in virtue of the relations of column heights to one another, a relation that inheres in the representation. The inherent structural characteristics of the representation constrain what it can function as a representation for. A proposition, on the other hand, is said, on his scheme, to represent something only in virtue of a relation to something external to it - that for which it is a true description. A proposition is an "extrinsic" representation because it is constrained in what it can represent by its relation to something external to it. But, Palmer argues persuasively, whether a type of mental representation is digital (here, "propositional") or analog is not discernible solely on the basis of information content that behavior reveals the agent to have.

I will return to Palmer's distinctions a little later, after considering recent behavioral evidence that suggests that perceptual categorization in humans may become digitalized by, while remaining distinct from, acquired conceptual categories. For the moment, I conclude that widespread acceptance of the analog-digital account of the contrast between perception and conception is assisted by conflating sensation and perception in the notion of sensory perception; and that such accounts are by no means transparently appropriate. But what I suspect is stronger than this: it is that perception may acquire digital properties in the course of conceptual (semantic) development.

#### IV

Why should perceptual categories be distinguished from conceptual categories? Since sensation, perception and conceptualization are normally phenomenally "merged" for mature and intact humans, appeals to our normal phenomenal experiences provide no compelling evidence for this distinction. The case for making this distinction must rely, then, on its theoretical utility and explanatory power. There are four types of considerations that have bearing, three of which I describe only briefly here; the fourth will be discussed in greater detail in later sections.

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The first consideration is that a notable increase in economy, simplicity, and intelligibility in the theory of language acquisition can be effected by acknowledging that there is a level of cognitive development in which new perceptual categories are acquired in the course of early language learning but prior to genuine linguistic semantic conceptualization. The argument for this claim is developed at length elsewhere (Nolan 1994), but the next considerations suggest the focus of this argument.

A second consideration is that a principled distinction here would provide an explanation of prototypicality effects, effects that prompted Rosch (et al., 1976) to introduce the notion of "basic categories", in particular during cognitive development and the emergence of language, but also in general. The distinction invites the framing of the following account. A degree of mastery of a category such as *dog* is achieved largely on the basis of perceptual schemata which constitute a perceptual category. That such a perceptual category cannot be "manufactured" (as it were) by humans merely as the output of sensation, we have been amply assured by the history of failures of sense datum theories; it is the categoriality of the category *dog* that escapes such theories. A perceptual category (such as *animal*) may then be subject to transformation during

the course of development to yield a conceptual category (such as *mammal*), perhaps together with a replacement prototype as its correlative perceptual category. Prototypes can thus be understood as perceptual categories, even in the absence of semantic, conceptual understanding of the related concept.

A third consideration in favor of the distinction is that it makes transparent the inadequacies of purely extensional accounts of natural linguistic meaning, even extensional accounts couched in the idiom of possible worlds semantics. Thus, a degree of mastery of a category such as *triangle* can be achieved largely on the basis of perceptual schemata. In all possible worlds, however, equilateral and equiangular triangles are coextensive. The conceptual category of *triangle*, thanks to Euclid, is what makes possible the intensional non-equivalence of equilateral and equiangular triangles; what Bealer (1982; see also Bealer and M6nnich 1989) has called "fine-grained intensionality".

One may add to the foregoing considerations that the distinction may provide a basis for understanding the differences between human cognitive aptitudes and the aptitudes of members of non-human species. For we may allow that some of the latter may be susceptible to developing new perceptual categories as a result of experience without acceding that their development is conceptual. Distinguishing perceptual from conceptual categories may suggest, as well, an account of perceptual phenomena to which Gestalt psychologists have called attention. But there are problems with each of these possibilities that require more detailed attention than can be attempted here. For example, it is terribly unclear whether or when distinct sensory and perceptual levels play roles in the lives of members of non-human species; and Gestalt psychologists have called attention to phenomena which

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seem, oddly, cognitively impenetrable (cf. Kanizsa, 1979) in the sense that they are not susceptible to correction by true beliefs which contravene them. It would thus seem premature to pronounce on these issues in the present context.

A fourth set of considerations is provided by experimental results in neuro-behavioral psychology. These results seem to mandate the acknowledgment of perceptual categories as distinct from conceptual categories, and I will describe them shortly.

## V

The idea that there are non-conceptual perceptual categories that have a central function in our cognitive lives is closely related to the notion of non-conceptual perceptual *content* introduced by Evans (1982: 151 n.). However, the example Evans gives to illustrate the occurrence of non-conceptual perceptual content is our use of indexicals like 'here', which he calls "egocentric spatial terms" (p. 154). So, while he is concerned to distinguish an element in perception that is not conceptual, he does not seem to be referring to non-conceptual, perceptual categories, as I have used that term so far. He is discussing, he says, "the spatial element in the non-conceptual content of perceptual information" (p. 154). What Evans seems to be describing in these passages is the character of our conscious awareness of the location in external space of some stimulus (auditory, in Evans's examples) when we attend only to that phenomenon of location, rather than to the character of the stimulus as conceptualized. He appears to be attempting to isolate in our conscious (phenomenal) experience a non-conceptual, perceptual element what he calls 'information content' - regardless of whether this element is veridical, since he means to include mis-information in the scope of his "information": "The spatial information embodied in auditory perception is specifiable only in a vocabulary whose terms derive their meaning partly from being linked with bodily actions" (p. 157). He is, he says, "talking about... information

whose content is specifiable in an egocentric spatial vocabulary."

But these perceptual information states with non-conceptual content 'are not', he says, "*ipso facto* perceptual experiences" - that is, conscious states of a conscious subject. "However addicted we may be to thinking of the links between auditory input and behavioural output in information processing terms in terms of computing the solutions to simultaneous equations [he takes Fodor's *Language of Thought* as an example of such addiction] it seems abundantly clear that evolution could throw up an organism in which such links were established, long before it had provided us with a conscious subject of experience" (pp. 157-8). To illustrate this possibility, he cites "the case of a brain-damaged patient studied by L. Weiskrantz, who was able to point to a source of light despite claiming that he could not see anything at all" (L. Weiskrantz *et al.*, 1974). "But always he was at a loss for words to describe any conscious perception, and repeatedly

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stressed that he saw nothing at all in the sense of 'seeing', and that he was merely guessing" (Evans, p. 158). What this shows, Evans says, is that "a conscious adult may display fairly normal responses to stimuli... and yet have no associated conscious experience". Elsewhere, Evans describes the "informational states which a subject acquires through perception" as "non-conceptual, or non-conceptualized" (p.227). In contrast, "Judgments *based* upon such states necessarily involve conceptualization: in moving from a perceptual experience to a judgment about the world (usually expressible in some verbal form), one will be exercising basic conceptual skills" (p.227). In other words, Evans describes the usual relation between non-conceptual perceptual states and conceptual states as a relation between two types of informational states such that one ordinarily moves from the former to the latter.

I conclude this synopsis of Evans's account of non-conceptual perceptual content by noting that while his notion of non-conceptual perceptual content is not clearly a notion of non-conceptual perceptual *categories*, his related notion of a non-conceptual perceptual information state (understood as neutral with respect to veridicality of information) may be useful to describe a perceptual state in which a perceptual category is invoked by a stimulus-situation.

## VI

For moral reasons and more, the case of Weiskrantz's patient is the closest we can come to satisfying Palmer's stipulation that we must "look into the brain" if we want to distinguish different structures of mental representation. More recently, another medical accident has revealed information about mental structures of a type that provides empirical support for the distinction proposed between perceptual and conceptual categories. I note at the outset that this data, while systematically collected, was also an accidental result of a hospitalization and that the elderly patient succumbed to illness three months after these results were collected.

Hart and Gordon (1992) report behavioral research results with a subject who sustained cerebral damage and whose resulting knowledge deficits are directly relevant to the hypothesis that there are non-conceptual, perceptual categories. The authors maintain that the results they report "mandate the existence of two distinct representations" of the physical attributes of animals in normal individuals, one visually based and one language-based" (1992: 60). The neurologically-impaired patient (K.R.), a retired librarian, exhibited category-specific dysnomia for the category of animals "despite the input modality (visual or non-verbal sound) or response route (oral or written)" (p. 60). In addition, the patient was unable to describe verbally the physical attributes of animals. Nevertheless, she was able to distinguish between visual representations of animals that depicted their physical properties correctly and incorrectly, and

"her knowledge of other animal properties was completely intact" (p. 60). The modality-independence of

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the patient's deficits lead the researchers to conclude that the deficit is a higher-level, central processing impairment. These results are also said to "establish that knowledge of physical attributes is strictly segregated in the language system from knowledge of other properties" (p.60).

Let me highlight somewhat less technically a few of the specific results upon which the authors base their conclusions. The patient, K.R., was unable to name animals nor to describe verbally either the correct colors of animals or other visible, physical (as opposed to functional) attributes of animals, such as number of legs or size. For example, when asked what the color of elephants was, she responded, "Orange". However, she could pick out pictures that depicted correctly-colored, -legged, and -sized animals from those that depicted these incorrectly; K.R. could also correctly match, visually, animal bodies to their respective heads. Her success on these last two types of task indicate that she had visually-based knowledge of these features of animal categories, and that her knowledge-deficit was language-based. Her language-based impairment was limited to the visual attributes of animals (as well as to their names); she had no knowledge-deficit about other kinds of things nor about non-visual attributes of animals. For example, K.R. was able to answer correctly questions about functional properties of animals such as "Is an elephant edible?" and "Is it a pet?"

Hart and Gordon present other data from K.R. that they take as showing, on standard neuro-behavioral criteria, that her deficit was not merely a language-access deficit but was a language-representation deficit. They point out that any other hypotheses consistent with the data

must nevertheless acknowledge that the deficit was category-specific to animals and that it mandates the existence of two distinct knowledge-representation systems for the visible physical properties of animals, one language-based and one visually-based (p. 63). The case of K.R. presents an elaboration over the minimalist "look into the brain" (to discern different representational structures) that is afforded by Weiskrantz's patient. Although philosophers will have further questions about the case that Hart and Gordon describe, K.R., unlike Weiskrantz's patient, provides direct evidence of the categoriality of non-conceptual perceptual "information". While Hart and Gordon focus their report on the character of K.R.'s *linguistic* deficit, the fact that her accurate, non-linguistic responses were occasioned by visual representations—line drawings in fact—of the properties of animals for which she retained no evident linguistic representations makes apparently unavoidable the conclusion that her visual perceptual information was categorial—about animals, about specific animals (animal species), and about their visible physical properties, but not about any particular individual animal. Indeed, their categoriality lies in this fact about them, that they are generic. In this respect, they differ markedly from the indexical, egocentric spatial non-conceptual perceptual content to which Evans calls attention.

Hart and Gordon end their report with a brief summary (p.64) of what is known of the anatomical bases of category-specific deficits like K.R.'s, not-

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ing that relatively little pathological evidence is available. "Most patients have shown temporal lobe pathologies... Pathologies limited to the fronto-parietal lobes have been associated with impairments of the nonliving things categories." Of K.R.'s case, they mention "diffuse, mild inflammation attributable to a paraneoplastic syndrome that involved the cerebral cortex,

including both temporal lobes" and "Incomplete or patchy disruption, rather than a complete and sweeping disruption". Their conclusion is that "A number of neural processing architectures (hierarchical or distributed networks) could produce the processing distinctions and anatomical assignments K.R.'s case requires."

## VI

How might a distinction between perceptual and conceptual categories be drawn, supposing that the above considerations suggest that such a distinction should be made? How, that is, might we conceive of the difference between such types of categories so as to capture the chain of intuitions linking the considerations raised above? And, further, can we conceive of such a difference in a way that might provide some conceptual advance about the several issues mentioned here?

If we have, in the responses of K.R., a case in which intact non-conceptual perceptual categories have been manifested in a person's behavior in the absence of, and hence in isolation from, any correlative conceptual categories, then we should be able to describe those respects in which the one type of behavior differs from the other type. Here, I do not mean that the relevant differences are merely behavioral; obviously they are not. But it is unlikely, at least, and perhaps inconceivable, that any "looking into brains" alone that we might now do could reveal relevant differences without some further macro-description of the differences.

I propose that the focus for such a distinction may be found in adopting a principle introduced by Evans, what he called the "Generality Constraint" as a characterization of conceptual categorization and as distinguishing it from perceptual categorization. Although Evans introduced his principle in a context different from this one and with quite different theoretical goals from those that I am concerned with here, Evans was also keenly aware of the

importance, and the difficulty, of distinguishing between perception and conception. Indeed, Gillett has argued (1987) for the stronger conclusion that there is a conceptual relation between Evans's constraint and the idea of a conscious thinking subject. The constraint is introduced in Evans's work during in the course of discussing Russell's theory of singular terms and was intended to contribute to an account of what is required for a person to be able to make a predicative judgment about a particular individual. Hence, the sentence schemata used in its statement are schemata for particular statements, and, so, use individual constants (i.e., *a*). The present proposal is that the same constraint, with some minor changes that include changing its individual constants to variables (e.g., *a* to *x*) in the schemata, can be

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used also to characterize the ability conceptualizers have to make predicative judgments using general terms, concepts, or conceptual categories. Here is Evans's constraint:

...if a subject can be credited with the thought that *a* is *F*, then he must have the conceptual resources for entertaining the thought that *a* is *C*, for every property of being *C* of which he has a conception. This is the condition that I call 'The Generality Constraint' (Evans 1982:104).

(To adapt the constraint to the use for which it is proposed here, suitable limitations to its generality would also need to be made. For example, it is not necessary that one be able to entertain the thought that *x* is & for *everg* property of being *C* of which one has a conception, but only for some selected subclass of such properties of which one has a conception.) According to this constraint, what distinguishes true conceptual thinkers from "mere responders or information processors" (Gillett, 1987, p. 20) is that predicates available to the thinker must stand in contrastive relations *for the thinker* to other predicates available to the thinker:

Even readers not persuaded that any system of thought must conform to the Generality Constraint may be prepared to admit that the system of thought we possess - the system that underlies the use of language - does conform to it. (It is one of the fundamental differences between human thought and the information- processing that takes place in our brains that the Generality Constraint applies to the former but not to the latter...) (Evans, 1982, p. 104, n. 22).

The suggestion that Evans's constraint provides is that, while both perceptual and conceptual categories are abstractions, only conceptual categories must satisfy the Generality Constraint. For a subject to have a concept, hence to be able to use a general term in a predicative judgment, the subject must satisfy the Generality Constraint (suitably modified) with respect to that concept or term.

Here, then, are some tentative consequences of the general proposal I have here considered. One may satisfy the Generality Constraint (suitably modified) with respect to some conceptual categories but not others; such, one can suppose, is the plight of each of us. And one might fail to satisfy the constraint with respect to certain categories with which one might nevertheless be able to perform sorting tasks; such was K.R.'s plight in particular. When this is the case, one has a perceptual category but not a conceptual category. Members of other species may not satisfy the constraint for any categories, lacking conceptual categories entirely, but be able (as surely most must) to perform sorting tasks on the basis of non-conceptual perceptual categories. Some conceptual categories have noteworthy relations to perceptual categories: the conceptual category of animal to the perceptual category of dog, furniture to chair, vegetable to carrot; the conceptual category of

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equiangular triangle to the perceptual category of triangle. One consequence can be stated less tentatively: neither conceptual nor perceptual categories can be generated mechanically from

sensory processes alone.

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