

Perceptual Objectivity

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A central preoccupation of philosophy in the twentieth century was to determine conditions under which it is possible empirically and accurately to represent elements in the physical environment as having specific physical characteristics. Such representation was widely, and I think correctly, taken to constitute a basic type of objectivity. Objectivity in this sense consists in veridical representation of a mind-independent reality.

In the second half of the twentieth century, many philosophers saw empirical representation of the physical environment as *conceptually* necessary for all representation. I do not accept this view. I think that representation of mathematical and mental matters is conceptually and

This article has had a long evolution. I have given ancestors of it as part of the Carus Lectures at the American Philosophical Association in San Francisco, the Hempel Lectures at Princeton, the Kant Lectures at Stanford, the Seybert Lectures at University of Pennsylvania, the Thalberg Lecture at University of Chicago, the Townsend Lectures at University of California, Berkeley, and a series of unnamed lectures at the University of Bologna. I have also given some of the material at colloquia or conferences at the following institutions: University of Alabama, University of Arizona, Arizona State University, Australian National University, University of British Columbia, Brown University, University of California, Riverside, University of California, Santa Barbara, Cornell University, Deutsche Konferenz für Philosophie in Berlin, Georgetown University, University of Göttingen, University of Kansas, University of Miami, University of Munich, New York University, Syracuse University, and University of Washington. I have benefited from discussion on these occasions. I am particularly indebted to Ned Block, Dagfinn Føllesdal, Krista Lawlor, and Colin McGinn. An abstract of this article has been published: "Abstract: 'Perceptual Objectivity'," in *Kreativität*, XX Deutsche Kongress für Philosophie (September 26–30, 2005), ed. G. Apel (Hamburg: Felix Meiner Verlag, 2006). The present article is partly extracted from a book, *Origins of Objectivity*, forthcoming from Oxford University Press. All matters discussed here are discussed in greater depth in that work.

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epistemically, though not developmentally, independent. Empirical representation of the physical environment is nonetheless a central aspect of objective representation. I shall concentrate on it here.

A certain type of account of the constitutive conditions on objective empirical representation dominated the previous century. I believe that all versions of this type of account are mistaken. In this essay I will describe the mistake, discuss some examples, and sketch a different standpoint on empirical representation of the physical world—on perceptual objectivity.

I begin with some terminological remarks. My term “representation” applies to a successful perceptual, cognitive, or linguistic representational relation to particulars, kinds, properties, or relations in a subject matter. I use “*represents* ___” to comprise both successful singular reference and successful attributive indication of kinds, properties, or relations. “*Represents ___ as such*” is more committal. Take the instance, “represents bodies as such.”¹ The phrase applies to language or representational content that represents bodies as being bodies.² The phrase “*represents as of body*” does not entail that there is successful representation of body, token, or type. It does entail that there is an attributive application of a body representation or body representational content. Representation as of body is purported indication or attribution of the kind *body*, represented as such.³

1. I write “represents bodies as such” rather than “represents physical bodies as such” because I doubt that perceptual systems have a perceptual attributive physical, whereas they do have a perceptual attributive body. I think, however, that there are no bodies except physical bodies.

2. More precisely: An individual—or an individual’s perception, thought, other type of psychological state, a representational content, or a piece of language—represents something *as such and such* if and only if it *represents* something by way of a such-and-such type of representation (or representational content). Thus a perception represents something as square if and only if it does so by way of a square-type of representation. The sense of “square-type” is, of course, not that the representation is square. Rather the relevant representational kind is individuated in terms of the representational kind (representational content) square.

3. “Purported”: body representations never fail to indicate the kind *body* since there is such a kind. But some attributives can fail to represent or indicate anything. Phlogiston (or is phlogiston) is an example. Such attributives do not succeed in attributing a kind, property, or relation. Nevertheless, they can occur attributively in a genuine perception or thought.

Attribution of any given kind or property can always occur in many possible ways. Although all representational contents as of bodies indicate the kind *body*, and are capable of attributing this kind, the indication and attribution always occur from a perspective or in a mode of presentation. There are many perspectives on, or ways of representing, any given property, kind, or relation—even representing it as such. This variety is salient in

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Since sense perception is central to our discussion, I make some brief remarks about its representational content. Sense perception functions to represent particulars. Successful perception is necessarily of particulars. So perceptual content that sets veridicality conditions must have at least one singular element. The element is context-dependent since it can apply only to what causes it. Perception must also involve application of general abilities that function to group or categorize types of particulars from a perceptual perspective on those types and particulars. So in perceptual content, there must be a general element as well as a singular element. I call these general elements *perceptual attributives*. Perceptual attributives are *as of* such and such.⁴ In veridical sense perception, perceptual attributives are veridical of the particulars that the singular elements referentially apply to. They attribute kinds, properties, or relations to the perceived particulars. The perception veridically represents a particular as being the way the perceptual attributives indicate. So much for terminological preliminaries.

For most of the twentieth century, discussion of minimum conditions for empirical representation of physical subject matters had a definite directional bias. This bias is what I call *Individual Representationalism*. According to this view, an individual cannot objectively and empirically represent a physical subject matter as having specific physical characteristics unless the individual has resources that can represent some central conditions under which such representation is possible. Individuals qualify as engaging in objective empirical representation by having resources for explaining what they are doing. The individual's own representations incorporate within themselves conditions that could be used to explain

perceptual representation. There are many perceptual modes and perspectives that comprise many perceptual representational contents, all of which are ways of representing something as of a body.

For present purposes, I do not distinguish "representation"—as applied to a representing entity—from "representational content." I believe that talk of representation is theoretically secure. For those who are squeamish about such talk, it might be worth noting that the argument of this essay could dispense with it in terms of perceptual, linguistic, or conceptual attribution.

4. For an extensive discussion of the notion of perceptual attributive, see my "Five Theses on *De Re* States and Attitudes," in *The Philosophy of David Kaplan*, ed. Joseph Almog and Paolo Leonardi (Oxford: Oxford University Press, 2009), 246–316. For a much more extensive discussion of the representational content of perceptual states, see my "Disjunctivism and Perceptual Psychology," *Philosophical Topics* 33 (2005): 1–78. The "as of" locution does not imply consciousness.

objective representation of the environment. The individual must in effect have the resources to do the objectifying.⁵

There are two families of versions of this view. One family dominated the first half of the century. It claimed that to represent a physical subject matter as having specific physical characteristics, an individual or an individual's perceptual system must be able to construct a representation of that subject matter from *more basic* representations. The more basic representations represent elements constitutively necessary to representation of the physical world—elements that are subjective or proto-objective. The second family, which dominated the century's second half, held that to represent a physical subject matter as having physical characteristics, an individual must be able to *supplement* this representation with representation of *general* constitutive features of objectivity. The two families differ in many ways. What makes them both types of Individual Representationalism is their both holding that objective representation requires representing some constitutive conditions on objective representation.

A typical example of first-family Individual Representationalism requires that the individual, or the individual's representational system, be able to construct descriptions like the cause of such and such sense data. A typical example of second-family Individual Representationalism requires the individual to have criteria of individuation.

Individual Representationalism was often presented in developmental form. A child or animal is taken to begin in a solipsistic stage. Alternatively, there is an exotic preindividuated referential structure that corresponds poorly to ordinary macrophysical reality. A child is then passed through stages that lead to representing ordinary bodies and their properties.

Such views were prominent in psychology as well as philosophy. William James took the child to begin in confusion: "The baby is assailed by eyes, ears, nose, skin, and entrails at once . . . feels it all one great blooming buzzing confusion."⁶ A world had to be constructed out of chaos by

5. Individual Representationalism is to be sharply distinguished from another view in philosophy, called "representationalism," that concerns the nature of *qualia*. This latter view holds that all "qualitative" mental states, like pain, are constitutively and exhaustively representational states; their natures are entirely representational. The view that I am concerned with maintains that some constitutive preconditions for objective empirical representation must be internalized and represented in the individual's psychology.

6. William James, "Percept and Concept—The Import of Concepts," in *Some Problems of Philosophy* (Lincoln: University of Nebraska Press, 1996; first published 1911), chap. 4.

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representing patterns among the sensations; both sensations and the relevant patterns are preconditions for objective representation.

Piaget held that human infants are initially solipsist-phenomenalist. He maintained that the child must go through a series of stages whereby practical manipulation of objects allowed a construction of a representation of a mind-independent world.⁷

Despite developmental casts of the view, the view's philosophical import is conceptual. It maintains that representation of the physical environment is intelligible only by reference either to construction in the individual's psychology of such representation from more basic representation of *particulars*, or to the individual's having linguistic or conceptual resources that supplement perception by mirroring *general* conditions of objectification. The construction or supplementation must be by or in the individual.

In philosophy, the sense-data view of perception was the prevailing first-family form of Individual Representationalism in the century's first half. When this view was rightly given up, most philosophers still maintained that objective empirical representation must be buttressed with criteria, or divided out from less reticulated representation, or achieved like "light dawning gradually over the whole" through the confluence of interlocking, objectifying conceptual resources. I concentrate on this second-family form of Individual Representationalism here.⁸

Strawson postulates an initial feature-placing stage.⁹ Quine thinks of the initial stage as responses to patterns of whole-body stimuli, and holds that mass-like representations are the best approximation to interpreting the experience. The individual must learn to "divide" reference into individuated packages. Strictly speaking, according to Quine, no objective reference occurs until a linguistic individuating apparatus is developed. Like Strawson, he places great weight on a capacity to represent individuation

7. Jean Piaget, *The Construction of Reality in the Child* (New York: Basic Books, 1954).

8. The dawning metaphor comes, I think, from Ludwig Wittgenstein, *On Certainty* (London: Blackwell, 1969).

9. Strawson allowed that feature-placing in thought could represent instances of properties, instances of masses, and instances of event types in the physical environment. But the placing was supposed to lack genuine placing in space. P. F. Strawson, *Individuals* (Garden City, NY: Anchor Books and Methuen and Co. Ltd., 1963; originally published 1959), 208–16. I will cite page numbers both to this edition of *Individuals* and to the more widely available edition, same title (London: Routledge, 2002). I cite page numbers in this latter edition in brackets. In this case: [202–9]. Strawson's requirement on representation of criteria was imposed only with regard to the representation of physical individuals (bodies). He never explains how criteria-less feature-placing is possible.

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conditions for bodies. Davidson postulates no prerepresentational stage, but maintains that representation requires linguistic communication and various linguistic resources associated with individuation.

The supplementary abilities that are required vary. Some neo-Kantians hold that representation of the physical environment requires representing principles of causation. Others hold that one must be self-conscious in distinguishing perceptual appearances from mind-independent objects, so as to conceptualize a seems-is distinction. Strawson maintains that to represent bodies one must have a general conception of space and an ability to track one's own path through it. Quine claims that one must have linguistic resources for quantification, sortal predicates, and a criterion for when physical objects are identical or different.

All of these claims take the problem of understanding representation of the physical environment—and sometimes all objective reference—to be that of specifying general representational abilities that the individual must be able to exercise if representation of entities in the physical world is to be possible. All require that these abilities in turn represent constitutive general features of objectivity.¹⁰

These claims have an air of excitement and depth. I think that all are mistaken. I believe that not a single argument for these claims has any force. Such claims lean on a zeitgeist that assumes a broad explanatory strategy to be sound.¹¹ The strategy is to explain objective representation as the product of the individual's representing some constitutive conditions for objectivity.

Most discussion of objective representation postulates conditions that are much more sophisticated and intellectual than are warranted. Nearly all second-family views leave it doubtful that animals and human infants perceptually represent (or represent as of) bodies, or any other element in the physical environment. Such positions run against common sense. They are overrun by perceptual psychology. Armchair

10. Strawson is a slight exception to these points. See n. 9. He allows objective feature-placing in thought about the physical environment without evident requirement of representation of general criteria. I believe that this exception is only of slight significance in the larger scheme of things. I will discuss this matter in further work.

11. It is hard to identify the underlying syndrome that leads to Individual Representationalism's mistake. Certain philosophical ideologies abetted different versions of the view—verificationism, vestiges of idealism, descriptivism, the quest for epistemic certainty. I conjecture that a tendency to overrate the role and power of individuals in determining the nature of their representational powers might be close to the common root. But I leave this question open.

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arguments for Individual Representationalism are not nearly powerful enough to show common sense or psychology to be mistaken.

I take it as definitional that concepts are certain components of representational contents of *propositional thought*. I also maintain that perception refers and attributes, but is not conceptual. Unadulterated perception does not depend on conception. It is not propositional thought. *But these are not my primary points*. Even if perception were conceptual, perception would not, of itself, supply the representational apparatuses required by any of the various views. Yet it yields objective representation of particulars in the environment as having specific physical attributes. It produces primitive objective representation that lies at or near the starting point of representation. It does so in prelinguistic animals, even in animals that appear to lack propositional attitudes.

Individual Representationalists have the matter exactly backwards. Representation of, and as of, physical subject matters—even representation as of bodies—developmentally and phylogenetically precedes having propositional thought, let alone language. It occurs in primitive, unaided perception. Philosophy can make objective representation intelligible without requiring it to be associated with linguistic or generalized conceptual abilities. Objective representation is fully present in perception.

I will later say more about what I mean by “representation” and “perception.” I say here only that I mean these terms in relatively rich senses—senses that ensure that I am not simply changing the subject in disputing Individual Representationalism. I am not invoking an alleged kind of intentionality that makes it trivially true that “representation” of physical entities precedes emergence of the resources invoked in the traditions to which I have alluded.

Individual Representationalism was abetted by philosophical views that maintain that meaning and reference in language or thought depend on the individual’s ability to specify or at least follow a verification procedure, or to describe the referent of a piece of language. Representational content of a mental state or piece of language was supposed by verificationists to be explained in terms of a procedure for verification. By mid-century this view had received rough treatment for its inability to explain meaning in theoretical scientific discourse. To many, however, this difficulty did not seem to apply to relatively basic applications of manifestly empirical representations. Descriptivism held that an individual need not have a verification procedure, but must be able to describe the referred-to objects uniquely. Both sorts of views erred in holding that if the individual’s psychology lacks resources for representing conditions for

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objectification, there can be no objectification. The idea was that the individual must be able to represent, not only features of entities represented, but features of objectification, if objective representation of the physical environment is to be possible.

A start toward better ways to think about representation occurred in the work on linguistic reference by Kripke, Putnam, and Donnellan, and indeed in the earlier work on demonstrative linguistic reference by Strawson.¹² I will be presupposing the main results of this work. I will also be presupposing my work on anti-individualism.¹³ *Anti-individualism* is the view that the natures of many types of representational states, marked partly by representational contents, are constitutively dependent on relations to their subject matter, prototypically the physical environment. These relations (typically patterns of causal relations) need not be representable by the individual. The work on anti-individualism shows that not just linguistic reference but the kind-identity of many mental states is constitutively dependent on causal relations to the environment, or on communicational relations to others with relevant causal relations to the environment.¹⁴ These relations cannot be assimilated to verification procedures or descriptions available to the individual. But they help determine the nature of mental states and their representational content.

A primary lesson from these bodies of work is that reference and the representational identities of mental states depend, constitutively, on more than what the individual can do to describe, find, confirm, or believe about what is represented. They depend partly but constitutively on causal

12. Saul Kripke, *Naming and Necessity* (Cambridge, MA: Harvard University Press, 1972); Hilary Putnam, "The Meaning of 'Meaning,'" in *Mind, Language, and Reality*, vol. 2 of *Philosophical Papers* (Cambridge, Cambridge University Press, 1975); Keith Donnellan, "Reference and Definite Descriptions," *Philosophical Review* 75 (1966): 281–304; "Proper Names and Identifying Descriptions," *Synthese* 21 (1970): 335–58; Strawson, *Individuals*, chap. 1 and pp. 114–15 [117–18].

13. Tyler Burge, "Individualism and the Mental," *Midwest Studies in Philosophy* 4 (1979): 73–121; T. Burge, "Other Bodies," in *Thought and Object*, ed. Andrew Woodfield (London: Oxford University Press, 1982), 97–120; T. Burge, "Intellectual Norms and Foundations of Mind," *Journal of Philosophy* 83 (1986): 697–720; T. Burge, "Cartesian Error and the Objectivity of Perception," in *Subject, Thought, and Context*, ed. John McDowell and Philip Pettit (New York: Oxford University Press, 1986), 117–36; T. Burge, "Individualism and Psychology," *Philosophical Review* 95 (1986): 3–45; T. Burge, "Perceptual Entitlement," *Philosophy and Phenomenological Research* 67 (2003): 503–48; T. Burge, "Disjunctivism and Perceptual Psychology." The first four articles listed are collected in my *Foundations of Mind* (Oxford: Clarendon Press, 2007).

14. For extensive discussion of relations between the work on linguistic reference and my work on anti-individualism, see the introduction to Burge, *Foundations of Mind*.

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and functional relations between individual and environment. So there is no reason to insist that the psychological conditions necessary for objective representation require that the individual do the objectifying himself or herself. Some of the work can be done by psychological subsystems. Some of it can be done by needs and activities of the individual and causal relations between the environment and these needs and activities. The individual need not be able to represent the operations of subsystems, or these needs, activities, or relations.

The work on reference and representational states just alluded to centered on language or on relatively sophisticated thought—thought communicated in language, or thought involving a capacity to appreciate what a natural kind is. But it is clear that some of the most important ontogenetic and phylogenetic roots of representation lie in *perception*. Representation of physical entities in language and thought is the way it is largely because representation in perception is the way *it* is. Remarkably, the work on linguistic reference by Kripke, Putnam, and Donnellan was not backed by any serious reflection on perception. If a reasonable conception of perception had been central in mid-twentieth-century philosophy, the discoveries about linguistic reference and mental representational content would have come more easily.

For example, the Kripke-Donnellan points about reference of names have rather obvious counterparts about perception. An object can be seen even though the perceiver cannot (in the seeing, given background knowledge) otherwise distinguish it from actual or possible look-alikes. Perceptual reference is not effected purely by perceptual attributives in the perceiver's repertoire. This point was brilliantly made by Strawson. It probably played some role in the overthrow of descriptivism.¹⁵ But Strawson concluded that perception, at least of bodies, must be aided by general supplementary conceptual criteria for individuation. Strawson's Individual Representationalism prevented him from exploiting his insight fully.

To take another example, perceptual reference is compatible with being wrong about most of the salient properties of a perceived object. The color, shape, position, and kind of an object can be misperceived, all

15. The main line of development of these theories of representation went through reflection on language and through sophisticated exercises of mind, not through perception. Donnellan in "Proper Names and Identifying Descriptions," sec. 8, does appeal to perception in one of his arguments against descriptivist theories of reference. But he does not develop the point into fuller reflection on the role of perception in primitive empirical reference.

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at once, even as the object is perceived. Here is a clear analog of a standard point made about the use of names and natural kind terms.

The representational content of perceptual attributives depends on relations to the environment. Whatever procedures that we have for discriminating and acting on such perceivable kinds derive their meaning from the fact that they are adaptations and accommodations in the perceiver's perceptual systems to the kinds themselves. The procedures do not provide meaning to perceptual states independently of kinds that are interacted with.

Individual Representationalism is not to be identified with individualism—the contrary of anti-individualism. Individualism maintains, roughly, that all or most genuine mental states do not depend for being the states that they are on any relations to entities beyond the body of the individual. Some Individual Representationalists are individualists. Many, especially many second-family Individual Representationalists, are not. Reflection on anti-individualism about perception helps undermine Individual Representationalism. But the relations between the two doctrines are complex. I shall not discuss these relations in any depth here.

Anti-individualism does yield materials for rethinking Individual Representationalism. In particular, I think that anti-individualism regarding perception, properly elaborated, provides a framework for rejecting Individual Representationalism. Moreover, I think that anti-individualism is presupposed in those parts of perceptual psychology that directly undermine Individual Representationalism.

I begin with some remarks about Kant, who is often taken as hero and inspiration for second-family Individual Representationalism. I then criticize representative arguments by Strawson and Quine meant to support particular forms of Individual Representationalism. Finally, I reflect briefly on what should replace Individual Representationalism.

I.

Kant's dictum, "Intuitions without concepts are blind" suggests that reference via intuition (roughly perception) is possible only when supported by concepts, which are in turn taken to be elements in capacities for propositional thought.¹⁶ Kant is often read here as placing a condition on objective reference. He is taken to hold that perceptual reference to a

16. Immanuel Kant, *Critique of Pure Reason* A51/B75.

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physical world requires concepts of substance, causation, spatial location, and the self.

This interpretation of the dictum is incorrect. One must scrutinize what constitutes blindness. There is textual evidence that Kant means by “blindness” lack of self-conscious understanding. Kant’s remark occurs in the explanation of conditions for cognition (*Erkenntnis*). “Cognition” is a technical term. A cognition is an objective conscious representation whose (actual) objective validity can in principle be established by argument, by the individual with the cognition.¹⁷ Cognition requires an ability to argue something about a representation. Kant’s dictum attributes blindness to intuitions relative to obtaining cognition, in this demanding sense. Presumably, animals and human babies lack concepts of *representations*. They cannot carry out justifications with regard to them. The dictum takes no position on whether they can represent mind-independent entities. It takes no position on the perceptual capacities of animals that lack concepts. More broadly, I believe that in the first *Critique* Kant is not primarily concerned with conditions on representing the physical world. He explains conditions on an ability self-consciously to *justify* representation of a world *conceived* as mind-independent.¹⁸

Kant is well known for giving conditions for the possibility of experience. Like “cognition,” “experience” (*Erfahrung*) is a technical term. Kant explains it in terms of empirical cognition.¹⁹ So having an experience in this technical sense requires an ability to establish something about it. In holding that one can have experience only if one is capable of self-consciousness and capable of unifying experience under categories

17. *Critique of Pure Reason* A89/B122. Kant also has a use of “*Erkenntnis*” that is much less demanding than the one explicated here. These two uses complicate the interpretative picture in ways that I will not be able to pursue here.

18. This is obviously a large interpretational issue. Here I am oversimplifying my view. I think that Kant does sometimes seem to mix points about reference with points about cognition, in his more demanding sense of “cognition.” I think that some of this mixing can be seen not to be in conflict with my main line of interpretation if one attends carefully to the distinction between Kant’s empirical realism and his transcendental idealism. Independence of perception from conception is admissible for Kant only from his empirical realist point of view. In any case, I believe that Kant’s main topic is cognition in the demanding sense. And I think that there are passages that indicate that he allowed to animals intuitions (though not concepts) of, and probably as of, physical entities. He clearly thought that animals lack concepts, as well as self-consciousness and cognition in the demanding sense. I hope to develop these interpretative matters elsewhere. Here I just want to caution against overreading Kant’s dictum. The famous dictum definitely does not claim that intuitions require concepts in order to intuit.

19. *Critique of Pure Reason* B147.

like cause, Kant is not proposing that higher animals and young children lack experience in an ordinary sense because they lack self-consciousness and a reflective access to an account of warrant (an argument for objective validity).

Kant says things that suggest such a doctrine. But the central project of the first *Critique* does not, in my view, depend on it. Evidence from Kant's lectures indicates that he thought that animals, which he regarded as lacking concepts, have empirical intuitions (perceptions) of physical entities. Kant tried to account for mature epistemic states. Cognition and experience are assumed to be epistemic states of beings capable of deliberation and of science.

Kant's misunderstood dictum inspired positions on conditions for objective reference. Many neo-Kantians hold that animals have only sensitive reactions to the physical world that function for their own good. Animals are held to lack perception of, and as of, specific physical entities because they lack required conceptual categories. Much of the inspiration for this approach to objective reference has been mediated and amplified by Strawson's work.

II.

It is important to distinguish the project of *explaining minimal constitutive conditions on objective representation* of the physical environment from the project of explaining constitutive conditions necessary for our *conception* of mind-independent entities *as* mind-independent. The second project is that of *explaining conditions for our conception of objectivity*.

It is part of the very formulation of the second project that one has a concept of mind. The claim that one has a conception of mind-independent entities *as* mind-independent entails that one has a concept of mind. An ability to hold that physical entities are independent of one's own mind, and everyone else's mind, requires a capacity for self-consciousness. Thus appeal to self-consciousness is no big step within the second project. It is already present in our ordinary *conception* of objectivity. The second project tries to understand the elements of our adult conceptual scheme. That scheme includes, uncontroversially, mentalistic concepts as well as concepts of a mind-independent world.

By contrast, the first project tries to explain minimal conditions on representing physical entities. It does not presuppose that to represent physical entities, one must have a concept of mind. The claim that to represent physical entities, one must have a concept of mind is a substantive claim. It is not entailed by the very formulation of the problem.

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Strawson's main project is, like Kant's, not to account for minimal conditions on representing physical entities. It is to account for our *conception of objectivity*. Strawson aims to "exhibit some general and structural features of the conceptual scheme in terms of which we think about particular things."²⁰ He takes this conceptual scheme to include thoughts not only about physical individuals but also about ourselves, and about the independence of physical individuals from minds. He takes self-consciousness to be included in the conceptual scheme.²¹ When he discusses identifying reference to particulars, he usually presumes a background of sophisticated self-conscious thought and often a context of linguistic communication.²²

There are few places where Strawson explicitly discusses conditions on objective representation independently of a presumption that it occurs in a scheme that includes a concept of objectivity.²³ Yet his work influenced others whose main focus is on such conditions. One reason for this influence is that Strawson sometimes moves, without comment, from an account of our *conception* of objectivity to points intended to bear directly on conditions for objective reference. In some cases, these moves seem to be an unnoticed slide. In others, they seem to result from unstated background assumptions.

The slide from discussing conditions for a conception of objectivity to discussing conditions for objective reference occurs in Strawson's exposition of Kant. In expounding the Second Analogy, without any supporting argument, Strawson counts it an insight of Kant's to reduce the problem of discovering "what is necessary to make a temporal succession of experiences (or perceptions) perceptions of an objective reality" to the problem of discovering "necessary conditions of the possibility of distinguishing . . . time relations between objects which the perceptions are to be taken as perceptions of . . . and time-relations between the members of the (subjective) series of perceptions themselves."²⁴ This is to reduce the problem of explaining minimum conditions on experience

20. *Individuals*, 2 [15].

21. *Ibid.*, 2, 24, 55, 61, 72–74 [15, 35, 65–66, 79–83]; see also P. F. Strawson, *The Bounds of Sense: An Essay on Kant's Critique of Pure Reason* (London: Routledge, 1989; first published 1966), 89, 91, 98.

22. *Individuals*, 2–3, 5ff. [15–16, 17ff.].

23. In some of these places, he clearly commits himself to Individual Representationalism. See, for example, "Entity and Identity" (1976), 21–51, and "Reference and Its Roots" (1986), 123–41, in his *Entity and Identity and Other Essays* (Oxford: Clarendon Press, 1997).

24. *The Bounds of Sense*, 124. Strawson makes it clear that the latter project presupposes empirical self-consciousness.

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of objective reality to the problem of explaining necessary conditions on our *conception* of the relation between perceptions and their objects—an aspect of the problem of explaining our conception of objectivity.

Strawson is primarily interested in our mature conceptual scheme. Yet he expounds Kant (dubiously, I think), on the presumption that perceiving physical entities depends on conceptualizing the distinction between perceptions and physical entities. Such a presumption would exclude children and animals, who certainly lack a conception of their perceptions as such, from perceiving physical entities as having specific physical attributes. Such a view would be high-handed and hyperintellectualized. Strawson probably believed this view. But his failure to call attention to its consequences and his failure to argue for it suggest that he slides carelessly between the project of explaining conditions for our conception of objectivity and the project of accounting for conditions on perceptual representation of physical objects.

The same slide resides in Strawson's discussions of experience. When Strawson introduces the notion of experience in his exposition of Kant, he does not give it the technical explanation that Kant does. He uses it as if it is a completely ordinary notion.²⁵

The issue of what to count as experience bears on Strawson's approving exposition of Kant's account of conditions for the possibility of experience. Strawson expounds Kant's view that "experience" requires a unity of consciousness. Kant and Strawson construe unity of consciousness as a capacity for self-consciousness—an ability to add "I think" to representations.²⁶ Strawson holds that the ability to recognize particulars as being of a general kind requires an ability to refer different experiences to a single thinking subject. Such an ability is said to preserve a distinction between a particular recognized and recognition of the particular. In sum, a capacity to ascribe experiences to a single subject is necessary for a conceptual capacity to distinguish between the way things seem and the way things are.²⁷ This latter capacity is claimed to be necessary for having experience.

This argument would need much more discussion than Strawson provides, if the notion of experience did not, virtually as a matter of terminology, exclude perceptions and perceptual beliefs of animals and

25. *Ibid.*, 15ff. This point applies to the passage from Strawson's discussion of the Second Analogy, quoted above.

26. *Ibid.*, 93, 98, 100–102. See Kant, *Critique of Pure Reason* B132–34, B138, and Strawson, *Individuals*, 75 [81–82].

27. Strawson, *The Bounds of Sense*, 100–102, 110–11.

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children, as Kant's does. For common sense and empirical science support the view that animals and young children have perceptions and beliefs about physical bodies. Yet there is no evidence that all these individuals have conceptualized a seems/is distinction or can think thoughts of the form "I think . . ." Strawson starts with a liberal, commonsense notion of experience. He gives arguments that are not nearly sufficient to reach their conclusions, unless the notion of experience in their premises is taken in a narrower sense.²⁸

Such requirements are perhaps plausible in an account of a conception of objectivity. They cannot be assumed in an account of objective representation—more specifically, an account of the capacity of perception, or even perceptual belief, to represent physical particulars, including bodies, as having specific physical characteristics.

Strawson either slides between the two projects or assumes Individual Representationalism. On this assumption, if an individual is to form a perceptual belief about bodies, the individual must be able to think conditions that make those abilities possible; general constitutive conditions must be conceptualized by the individual.²⁹ This assumption is, I think, mistaken. It is certainly not argued for.

Strawson's Individual Representationalism is further suggested by his demand that an individual have "criteria" for application of concepts. This demand is a holdover from verificationism, which marks Strawson's philosophy elsewhere. The slide in Strawson gained momentum—to the point of becoming a plunge—in his followers. I shall not discuss these variations on Strawson here.³⁰ I reserve fuller discussion of these matters to another occasion.

28. Strawson requires for objective, identificatory reference a capacity to track one's own body, in thought, in a comprehensive, allocentric spatiotemporal system. This requirement is not well supported, at least insofar as it is required for picking out individual things. See Strawson, *Individuals*, 12–14, 27, 102, 114–15 [24–26, 38, 105, 117–18]. I discuss this aspect of Strawson's work in *Origins of Objectivity*.

29. This view is commonly associated with an epistemic correlate: to be applicable, norms like warrant require conceptualization of the constitutive conditions. For reasons to doubt this sort of epistemic internalism, see my "Perceptual Entitlement."

30. Examples are Gareth Evans, *The Varieties of Reference* (Oxford: Clarendon Press, 1982); John McDowell, *Mind and World* (Cambridge, MA: Harvard University Press, 1994); John Campbell, *Past, Space, and Self* (Cambridge, MA: MIT Press, 1995); Quasim Cassam, *Self and World* (Oxford: Oxford University Press, 1997).

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III.

Quine maintains that the notions of meaning, reference, and representation lack objective status. He argues that attributions of such representations are indeterminate. He views psychology and semantics as less factual than natural science.

In *The Roots of Reference*, Quine pursues a separable line of reasoning. There he elaborates an account, polished through his career, of the development of, and conceptual priority among, referential devices. According to the account, human children begin with undifferentiated, not truly referential, sensory and sentential equipment; by learning certain specific linguistic devices, they come to be able to carry out genuine reference to entities in the environment. The account is meant as a contribution to psychology and linguistics, whatever their status. It can be evaluated on its merits, apart from the indeterminacy theses.³¹

The indeterminacy theses and the developmental account rest, however, on a common mistake. They fail to recognize certain continuities between natural sciences that specify ecological relations between individuals and their environment, on one hand, and the sciences of psychology and semantics, on the other. Reflection on anti-individualism illuminates the failure. The representational contents of an individual's perceptual states are partly constitutively individuated by the individual's discriminatory capacities and perspective. But the contents are also constitutively individuated by reference to entities indicated in explanations of the animal's basic biological needs and activities—eating, mating, navigating, fighting, fleeing, parenting.³²

Quine's error can be elicited by reflecting on mechanisms of perception. Perceptual mechanisms are successfully explained in terms of their representing types in the environment that figure in explanations of individuals' basic biological activities. Convergence is a visual system's determining location, hence distance, of a particular by triangulating from the light coming into the two eyes. There is a problem in finding what entities the two eyes converge upon and what attributives the perceptual system applies. Solutions to the problem consider not just positions where sight lines from the eyes intersect. There are many kinds and properties instantiated at any position from which the two eyes receive light. Solutions to the problem assume that those instances of types (in relevant

31. I include under "indeterminacy theses" the thesis of the indeterminacy of meaning and the thesis of the inscrutability of reference.

32. See, by way of comparison, Burge, "Perceptual Entitlement," sec. 1.

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positions) that are both discriminable by the individual *and* are of potential environmental relevance to individual biological functions, needs, and activity in coping with the environment help constitutively determine the types that the individual's perceptual system attributes, and the particular instances of types that the individual perceives.

In explaining the development of representation, Quine assumes a default neutrality among various possible referents—masses, light arrays, temporal stages of objects, universals, undetached object parts, and so on. None of these entities is central in explaining individuals' functioning with respect to basic biological needs and activities. They are not on a par with macrophysical bodies and their properties in determining the natures and contents of perceptual states. Explanation is *not* default neutral among them. Quine's argument claims that the representational contents of psychological states exhibit an indeterminacy "over and above" inductive indeterminacy in the natural sciences. This claim, like the default neutrality in his developmental account, derives from overlooking the methodology of explanations of perceptual capacities. It overlooks the fact that perceptual content is constrained by the subject matters of ethology and zoology. These accounts relate animals to the key environmental entities that figure in their activities.³³

In both the quasi-empirical account regarding development and the reasoning about indeterminacy, Quine takes the child to have a "sense" of the externality of the world in the early stages of language learning. He claims, however, that there is no genuine reference to anything until certain linguistic structures are learned.

33. A critical response to Quine's thesis of the indeterminacy of translation may be found in Noam Chomsky, "Quine's Empirical Assumptions," in *Words and Objections*, ed. Donald Davidson and Jaakko Hintikka (Dordrecht: D. Reidel, 1969). Chomsky correctly fixes on Quine's assumption that indeterminacy in the human sciences is "over and above" any indeterminacy in the natural sciences. Donald Davidson defends indeterminacy by assimilating it to the variety of scales of measurement, Fahrenheit and Centigrade for example. See D. Davidson, "A Coherence Theory of Truth and Knowledge," in *Truth and Interpretation*, ed. E. LePore (Oxford: Blackwell, 1986), 313. This defense underplays the point and degree of Quine's radicalism. On Quine's view, different translations can be incompatible—they assign some of the same sentences incompatible truth values—and yet be equally best. Different scales of measurement are fully compatible at each attribution. Quine's reasons for his indeterminacy thesis are various and sometimes obscure. I believe that the fundamental assumption is that meaning is given by confirmation procedures or dispositions to respond to stimuli and that these are not constrained by the individuation of kinds in the environment specifiable by the natural sciences. I believe that this assumption is without rational support and mistaken.

I will not discuss Quine's argumentation in detail here. I will try to convey a general sense for it. Quine begins his discussion of reference with an account of early stages of language use. He holds that the simplest bit of language is the one-word *observation sentence*. "Dog!" or "Red!" are examples. Quine claims that these sentences are "unstructured." He writes, "all the baby learns is to say his word when appropriately irritated and not otherwise."³⁴ There is no prior individuating ability that the language can be mapped onto.³⁵

Quine holds that an individuating ability can be attributed, and the relevant expressions obtain structure, only when the child acquires an auxiliary individuating apparatus needed to refer to objects. Only then can "Dog!" be construed as having the structure of "That's a dog!" The child must learn to "divide reference" if it is to represent physical objects.

Divided reference consists in an ability to individuate objects as being of certain kinds indicated by general terms that are sortals—terms like "apple," "dog," and so on. The relevant ability to individuate is supposed also to depend on mastering a further linguistic apparatus of plurals, identity, negation, pronouns, and quantifiers.³⁶ Sortals are needed to demarcate objects into kinds. Negation, plurals, and identity are needed to formulate discrimination of one object from another. Pronouns are needed to link different identifications over time and for quantification. Quantification is needed to formulate general principles of identity.

Quine writes:

For the very young child, who has not got beyond observation sentences, the recurrent presentation of a body is much on a par with similarities of stimulation that clearly do not prompt reification. Recurrent confrontation of a ball is on a par at first with mere recurrent exposure to sunshine or

34. W. V. Quine, *Word and Object* (Cambridge, MA: MIT Press, 1960), 91–92; a cognate passage occurs earlier, in 1957, in "Speaking of Objects," in *Ontological Relativity and Other Essays* (New York: Columbia University Press, 1969), 6–8.

35. A more complex discussion of the matter can be found in Quine, "Propositional Objects," in his *Ontological Relativity*. There Quine makes out a deflated use for attributing propositional attitudes to animals. He writes: "... the cat wants to get on to the roof. . . what the cat wants is a simple matter of superposition with respect to the roof, by whatever name" (146–47). The ensuing account leaves out representational content for the cat's state, and thus does not connect with perceptual psychological accounts. Quine is driven to this position partly by his requirements on individuation of attitudes and representational contents, and partly by his Individual Representationalism.

36. Quine, *Word and Object*, 93–95; Quine, *Ontological Relativity*, 32–33; W. V. Quine, *Roots of Reference* (La Salle, IL: Open Court, 1973), 84–101; W. V. Quine, *Pursuit of Truth* (Cambridge, MA: Harvard University Press, 1990), 23–28.

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cool air: the question whether it is the same old ball or one like it makes no more sense than whether it is the same old sunbeam, the same old breeze. Experience is in its feature-placing stage, in Strawson's phrase. Individuation comes only later.

True, an infant is observed to expect a steadily moving object to reappear after it passes behind a screen; but this all happens within a specious present and reflects rather the expectation of continuity of a present feature than the reification of an intermittently absent object. Again a dog's recognition of a recurrent individual is beside the point; the dog is responding to a distinctive odor or other trait, unavailable in the case of qualitatively indistinguishable balls. To us the question whether we are seeing the same old ball or just a similar one is meaningful even in cases where it remains unanswered. It is here that reification of bodies is full blown.³⁷

This last suggestion that objective reference to bodies is meaningful only when the question of sameness of object can be raised independently of specific answerable cases is elaborated more fully in the following passage:

After any considerable lapse of observation, however, the question of identity of unspecified dogs simply does not arise—not at the rudimentary stage of language learning. It scarcely makes sense until we are in a position to say such things as that in general if *any* dog undergoes such and such then in due course that *same* dog will behave thus and so.³⁸

Quine goes on to hold that deciding issues of identity requires constructing the simplest account in one's "overall scheme of things."

Quine assumes in these passages that his argument from default neutrality has established a preindividuated stage. The failure of this argument is the fundamental deficiency in these passages. There is no default neutrality among the various alternative kinds for attribution that Quine proposes. There is substantial empirical reason to believe that infants perceive and track bodies as bodies, and perceive such bodies as having various specific physical properties and as entering into various specific physical relations, long before they can think the generalizations that Quine requires.³⁹ There is no reason to think that their perception of bodies and attribution to them of the kind *body* and of specific physical properties is anything less than "full blown."

37. Quine, *Pursuit of Truth*, 24–25.

38. W. V. Quine, "Things and Their Place in Theories," in *Theories and Things* (Cambridge, MA: Harvard University Press, 1981), 7–8.

39. This point is made, with Quine as target, in Susan Carey, "Does Language Require the Child to Reconceptualize the World?" *Lingua* 92 (1994): 143–67.

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Quine assumes that only through acquisition of certain linguistic competencies can the individual transcend (alleged) lack of specificity in reference and attribution in an (alleged) preindividuating stage. He believes that the argument from default neutrality establishes that prelinguistic perception cannot represent bodies. I have already criticized this argument.

The quoted passages evince three more unarticulated assumptions that deserve comment.

First, Quine assumes that for young children and animals, issues of reidentification do not “arise” after considerable lapses of observation. I know of no reason to require long-term memory for representing bodies as bodies. Attribution of *body* through visual perception can be established independently of the role of such attribution in long-term memory. Reidentification after “considerable lapses in observation” is not necessary for perceptual representation as of bodies. Tracking a body in view, under appropriate attributional principles, is sufficient.

However, animals retain expectations over a wide variety of search times. Birds, monkeys, and apes track bodies over months without intervening observation.⁴⁰ The idea that issues of reidentification do not “arise” for these animals needs support that Quine does not give.

Quine thinks that there is a further special problem about determining whether nonlinguistic beings are reidentifying a particular or merely responding to resemblance or sameness of type. For singular reference to bodies, he requires explicit linguistic formulations of identity and difference, backed by general criteria for reidentification.

40. See, for example, Renee Baillargeon, Elizabeth S. Spelke, and Stanley Wasserman, “Object Permanence in Five-Month-Old Infants,” *Cognition* 20 (1985): 204–6; N. S. Clayton, D. P. Griffiths, N. J. Emery, and A. Dickinson, “Elements of Episodic-like Memory in Animals,” in *Episodic Memory: New Directions in Research*, ed. A. Baddeley, J. P. Aggleton, and M. A. Conway (Oxford: Oxford University Press, 2002); Bennett L. Schwartz, “Do Non-human Primates Have Episodic Memory?” in *The Missing Link in Cognition, Origins of Self-Reflective Consciousness*, ed. Herbert S. Terrace and Janet Metcalfe (Oxford: Oxford University Press, 2005), 225–41. For example, the Clayton et al. article (“Elements of Episodic-like Memory in Animals”) describes an ingenious set of experiments in which scrub jays cache perishable and nonperishable food packets and keep track of where they stored each food type and how long ago. There is independent ground for taking birds to be capable of perceiving bodies as such. These experiments show a capacity to track bodies for periods of one hundred hours. I note that the results do not depend on whether the birds remember the caching events themselves. It is enough that they track the duration of the presence of the objects in the various hiding spots. See also n. 52.

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There is no good ground for requiring an individual to be able to formulate a distinction between referring to a particular again and merely responding again to the same type. Some cases are, of course, difficult to determine. But one must look to the nature and function of the animal's perceptual systems, not to capacities to represent the relevant distinction in general form or to represent principles for drawing the distinction.

Successful perception is necessarily of particulars that can cause perceptual states. It would make no sense to take perception to be of attributes in the abstract. In experiments that show an individual discriminating a three-dimensional body from a surround and tracking it over time—perhaps in motion, or behind barriers—the alternative account is not that the individual perceives only some abstract shape or kind. The alternative account is that the individual perceives a series of instances of a property or kind, but not a single continuous instance of the kind *body*.⁴¹ Or the alternative account could be that it is indeterminate whether the individual is tracking a single body or a series of instances of some property or kind.

Given that science establishes that an individual has perceptual states—states marked by perceptual constancies—the individual need not have any further capacity to distinguish individuals from types. Perception cannot be of types alone. It always involves the individual's perceptually attributing types to particulars. So the question is whether, prior to the individual's acquiring linguistic devices for expressing general criteria for sameness and difference of instances of a type, a postulation that attributes to an individual perception as of a series of instances of a given type is always an equally good postulation as one that attributes perception as of a single instance of the type. These postulations are not commonly, much less always, equally good. In fact, the alternatives tend to be unmotivated and to yield ad hoc, less explanatory perceptual theories. Differentiating between the scientific postulations depends, not on the individual's ability to formulate bases for the differentiation, but to a large extent on the individual's nonrepresentational relations to kinds in the environment—assuming, of course, that the individual has been determined to have perceptual capacities.

41. I am assuming that it can be independently and empirically established that the individual has genuinely perceptual states. Of course, Quine's position trades on a failure to distinguish between perception and sensory registration of proximal stimulation. See sec. 4 for discussion of these matters.

Perceptual states are constitutively determined to be what they are by patterns of nonrepresentational interaction between individuals and particular instances of actual kinds in the environment. Perceptual psychology individuates perceptions in a way that accords with actual causally relevant facts in the environment, as described by other sciences. Take, for example, motion of solid bodies through space and time. Perception functions partly to enable an individual to track the way things are in order to carry out its basic activities. Since bodies are key factors in the basic pursuits of many animals, it is not surprising that many animals can perceive them as bodies. Mating, predating, and navigating depend on continuity of bodies through time. Perception functions to track such matters, insofar as the perceptual system has the discriminatory and objectifying capacities to do so.

The motion that perception tracks is in fact the motion of a single integrated body. Perception of a succession of very short-term instances of the kind *body* in different positions along a continuous path is not perception of anything in motion, and does not correspond to any biologically relevant environmental kind. Perceptual anti-individualism maintains that perceptual kinds are determined through interaction with relevant kinds in the environment. Perceptual psychology individuates in accord with this principle. The relevant environmental kind here is diachronic—motion of integrated bodies. For a perceptual system to match such a kind, it must track an identical individual in motion. Thus the type of explanation provided by perceptual anti-individualism *prima facie* favors attribution of perceptual tracking of a particular instance of the kind *body* over attribution of serial perception of different short-term instances of the kind. The alternative of taking individuals to track a series of instances fails to account for patterned and functional interaction with the kind *bodily motion*.⁴²

Perception tracks through its causal-perceptual relation to the particular. Perceptual memory can preserve that singular representation, for example, in tracking within view and behind obstacles. Explanations of the tracking make essential use of principles governing the motion and/or topology of a *single* integrated body. They do so because tracking single

42. Of course, perceptual anti-individualism does not hold that all perceivers track bodies. Whether a particular perceiver, or a particular perceptual system, tracks bodies is a specific empirical matter. The point is that if empirical considerations seem to support attribution of perceptual tracking of bodies, perceptual anti-individualism helps indicate why such attribution, as opposed to attribution of a series of perceptions of exactly resembling particulars, is warranted.

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bodies is important to the contribution of the perceptual system to the individual's basic biological activities—parenting, mating, predating, escaping, navigating.

Tracking in perception can be integrated with longer-term memory and application of such memory in action. For example, perceptual tracking can be integrated with pursuing prey behind obstacles, or in responding to a parent or mate after an absence, or in acting in a proprietary way toward a stash. Often such integration is connected to the animal's use of relatively specific maps and landmarks that require singular positional or landmark reference. These capacities can often be shown to connect perception and use of a spatial representation to find a formerly perceived entity. The spatial representation's content involves fixing particular spatial positions. The representational content of perceptions and perceptual memories that use spatial representation—in navigation, parenting, mating, predation, stashing—commonly depends on facts about the movement or continuation of individuals in space over time. Often the best account of an animal's memory treats it as an extension of the sort of perceptual tracking that holds the object in view, or of the sort of perceptual tracking that follows an object, in a short-term way, behind obstacles. Empirical best-explanations can support an account of the connections between such capacities, without needing to rely on evidence that the individual has general criteria for distinguishing tracking a particular from responding again to a type.⁴³

The second unstated assumption in the quoted passages is that expectations of animals and children regarding reappearing objects can be understood in terms of a specious present in which the individual expects only the reappearance of a stimulus or quality.⁴⁴ This assumption is mistaken. Infants and many nonhuman animals do not track by expecting qualities or specific proximal stimuli. They track bounded, closed,

43. I reiterate that I believe that for an individual to be able to represent bodies as bodies, it is not *constitutively* necessary that an individual reidentify them through lapses in observation. Many psychologists as well as philosophers assume this requirement. The requirement is not clearly motivated. I believe that appropriately extensive perceptual tracking itself counts as reidentification, and helps distinguish attribution of bodies from attribution of events and other particulars that are relevant to the individual's (or species') biologically basic pursuits. The capacity to track entities behind obstacles is, however, shared by a wide variety of animals.

44. Piaget proposed similar deflationary explanations—in terms of a phenomenalistic feature-continuity of an activity in a specious present. He applied these explanations to the kinds of cases (objects passing behind barriers) that Quine is referring to. See Piaget, *The Construction of Reality in the Child*.

relatively rigid three-dimensional figures—bodies. The specific shape, color, and ordinary sortal kind are strikingly unimportant in tracking during the first twelve months of human life.⁴⁵ Early infant tracking follows the most basic element specific to a body. Quine's deflationary account of tracking is empirically mistaken.

This point about infant perceptual tracking bears on a corollary assumption that dominates Quine's work. Quine holds that responses to shape are equally well construed as responses to certain types of clumpiness within a larger mass.⁴⁶ There is evidence that infants and animals are responsive to masses only well after they are responsive to bodies.⁴⁷ Quine's assumption that mass-like or feature-placing representations are either developmentally prior in human children to representation of bodies, or equally likely, is empirically mistaken.

Quine's third assumption constitutes the core of his position. The assumption is implicit in his claim that the traits that the individual relies upon are unavailable for qualitatively indistinguishable objects, and in the point that the question of identity is for us meaningful even in cases where it remains unanswered. The assumption is most nearly explicit in the remark that the question of identity scarcely makes sense "until we are in a position to say such things as that in general if *any* dog undergoes such and such then in due course that *same* dog will behave thus and so." The assumption is that for representation of bodies to be meaningful, the individual must be able to raise and answer questions about identity, individuation, and reidentification *in general form*, applicable independently of any particular tracking context.⁴⁸

This assumption is shared by Quine with Strawson. Strawson differs mainly in not requiring that reidentification be *linguistically* formulable. Both assume that an individual can represent bodies only if *the individual* can represent individuation and reidentification in *general form*, through some criteria for objectivity or individuation.

45. Claes von Hofsten and Elizabeth S. Spelke, "Object Perception and Object-Directed Reaching in Infancy," *Journal of Experimental Psychology: General* 114 (1985): 198–212; Baillargeon, Spelke, and Wasserman, "Object Permanence in Five-Month-Old Infants."

46. *Word and Object*, 51ff.; *The Roots of Reference*, 54ff., 81ff.; *Theories and Things*, 7–8.

47. Carey, "Does Language Require the Child to Reconceptualize the World?"; G. Huntley-Fenner, S. Carey, and A. Salimando, "Objects Are Individuals but Stuff Doesn't Count: Perceived Rigidity and Cohesiveness Influence Infants' Representation of Small Numbers of Discrete Entities," *Cognition* 85 (2002): 203–21.

48. For other passages that state or presuppose such a requirement, see Quine, *Roots of Reference*, 82; Quine, *Word and Object*, 93, 115ff.

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Late in life, Quine reworked the passages that we have been discussing. He distinguished between perceptual identification, on one hand, and “full reification” or “full reference,” on the other. This distinction is perhaps a sign of admirable late flexibility in Quine’s views. Still, the passage does not change the basic picture. Here it is:

As Donald Campbell puts it, reification of bodies is innate in man and the other higher animals. I agree, subject to a qualifying adjective: *perceptual reification* . . . I reserve “full reification” and “full reference” for the sophisticated stage where the identity of a body from one time to another can be queried and affirmed or conjectured or denied independently of exact resemblance. Such identification depends on our elaborate theory of space, time, and unobserved trajectories of bodies between observations. Prior recognition of a recurrent body—a ball, or Mama, or Fido—is on a par with our recognition of any qualitative recurrence: warmth, thunder, a cool breeze. So long as no sense is made of the distinction between its being the same ball and its being another like it, the reification of the ball is perceptual rather than full. A dog’s recognition of a particular person is still only perceptual, insofar as it depends on smell.⁴⁹

Despite allowing “non-full” reference in perception, this passage involves the oversights discussed earlier. First, perceptual tracking of bodies cannot be assimilated to sensory response to smells, breezes, or warmth. Nor does perceptual tracking depend on “exact resemblance.” Quine’s deflationary conception of perception has not developed in any fundamental way. Second, the requirement that the individual *make sense* of reference as a condition on engaging in “full” reference is the basic assumption of second-family Individual Representationalism. Quine gives no argument for it. Of course, there is a difference between an individual that perceptually tracks a body and an individual that can query, affirm, deny a distinction between identity and exact resemblance. But it has not been shown that this difference bears on the nature of reference, or on kinds or degrees of reference.

The idea that criteria of reidentification must be representable by the individual, or more broadly that the individual must have the resources to *make sense* of reference, if objective reference to bodies is to be possible, is the central second-family Individual Representationalist idea. Principles governing objective reference must be available to the individual, in the

49. I am indebted to Dagfinn Føllesdal for calling my attention to this passage. See *On Quine*, ed. Paolo Leonardi and Marco Santambrogio (Cambridge: Cambridge University Press, 1995), 350.

sense that he or she must have the wherewithal to represent enabling conditions for such representation.

The assumption of these requirements is so deeply embedded in Quine's and Strawson's standpoints that they do not discuss them, much less argue for them. I know of no good ground for them. Both the requirement of generality and the requirement that the individual be the agent of relevant supplementary representational capacities are mistaken.

Let me say more about why the requirement of *generality* is mistaken. An individual's perceptual capacities are individuated partly through causal and practical relations between the perceiver's perceptual system and entities in the environment (commonly in the system's evolution).⁵⁰ The relevant capacities need only be in play in particular perceptual contexts, embedded in particular environmental contexts. General conditions of individuation or objectification need not be representable in the psychology, even unconsciously. An individual need not be able to represent principles that *govern* the operation of a perceptual system. The system must operate under such principles. Its activities must be explainable as involving transitions under such principles. But the individual need not be able to, and usually cannot, make such principles the representational content of language or thought. Perception itself represents no general principles and lacks representations for its own representations. As I have indicated, there are alternatives in the practice of science that are empirically well entrenched and that build on the singular and attributive elements constitutively present in perception.

In light of our discussion, the requirement that the individual be the *agent* of the objectification is clearly mistaken. Objectification derives from the subindividual mechanisms of perception, and from the background environmental-perceptual-system relations that make perceptual representation possible. I shall return to objectification in the next section.

Quine is not a philosopher whom one tends to think of as hyperintellectualizing a subject matter. Still, in this case, the charge applies. Quine's assumption that objective reference to physical entities requires *language* is incompatible with empirical knowledge.⁵¹ Individual

50. See Burge, "Disjunctivism and Perceptual Psychology."

51. Quine's requirement is taken up by Donald Davidson in "Thought and Talk" (1975), in *Truth and Interpretation*, ed. E. Lepore, *passim*, but esp. 163, 170; "Rational Animals" (1982), in volume 3 of Davidson's essays, *Subjective, Intersubjective, Objective* (Oxford: Clarendon Press, 2001), 98–99, 101; "A Coherence Theory of Truth and Knowledge" (1987), in *Subjective, Intersubjective, Objective*, 137–57; "Epistemology Externalized" (1990),

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Representationalism is incompatible with empirical knowledge, whether or not it gives a special role to language.

There is substantial evidence that perceptual representation as of bodies occurs widely in the animal kingdom, and from the very beginning of human infant perceptual development. Children perceptually track bodies in motion by tracking bounded, relatively rigid three-dimensional figures. Tracking occurs over time and behind barriers. Even in the absence of motion, bodies are segmented from a surround and grouped as three-dimensional, bounded, relatively rigid wholes. Perception of shapes as three-dimensional has developmental priority.⁵² Studies of nonhuman visual systems are less abundant, but baby chicks, other birds, monkeys, apes, and other animals are similar in this regard.⁵³

Evidence and theory have grown since Quine wrote. But even in his time, Quine ignored substantial, specific evidence that perceptual

in *Subjective, Intersubjective, Objective*, 195, 202–3; “The Second Person” (1992), in *Subjective, Intersubjective, Objective*, 118–19; “The Emergence of Thought” (1997), in *Subjective, Intersubjective, Objective*, 124, 129–30; “The Problem of Objectivity” (1995), in volume 4 of Davidson’s essays, *Problems of Rationality* (Oxford: Clarendon Press, 2004), 4, 7–8, 10–11, 13; “What Thought Requires” (2001), in *Problems of Rationality*, 138–40.

52. It has been maintained that young children are inclined to reach for and pick up entities on computer screens—until eighteen months old. See J. S. Deloache, S. L. Pierroutsakos, D. H. Uttal, K. S. Rosengren, and A. Gottlieb, “Grasping the Nature of Pictures,” *Psychological Science* 9 (1998): 205–10. This particular claim has been brought into doubt: A. Yonas, C. E. Granrud, M. H. Chov, and A. J. Alexander, “Picture Perception in Infants: Do 9–Month-Olds Attempt to Grasp Objects Depicted in Photographs?” *Infancy* 8 (2005): 47–166. It may be that when infants are seeing figures on computer screens, they are representing two-dimensional surfaces as such. But for various empirical reasons, the principles that govern tracking these entities certainly overlap those governing tracking three-dimensional bodies. There is little doubt in the literature that perception of entities in three dimensions begins at the beginning of human perceptual development.

53. E. S. Spelke, “Principles of Object Perception,” *Cognitive Science* 14 (1990): 9–56; R. Baillargeon, and J. DeVos, “Object Permanence in Young Infants: Further Evidence,” *Child Development* 62 (1991): 1227–46; E. S. Spelke, K. Brelinger, J. Macomber, and K. Jacobson, “Origins of Knowledge,” *Psychological Review* 99 (1992): 605–32; C. R. Gallistel, “Animal Cognition: The Representation of Space, Time and Number,” *Annual Review of Psychology* 40 (1989): 155–89; M. D. Hauser, “Expectations about Object Motion and Destination: Experiments with a Non-Human Primate,” *Developmental Science* 1 (1998): 31–38; I. M. Pepperberg and F. A. Funk, “Object Permanence in Four Species of Psittacine Birds,” *Animal Learning and Behavior* 14 (1990): 322–30; L. Regolin, G. Vallortigara, and M. Zanforlin, “Detour Behavior in the Domestic Chick: Searching for a Disappearing Prey or a Disappearing Social Partner,” *Animal Behavior* 50 (1995): 203–11; L. Regolin and G. Vallortigara, “Perception of Partly Occluded Objects by Young Chicks,” *Perception and Psychophysics* 57 (1995): 971–76.

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systems of a wide variety of prelinguistic animals, including human infants, are geared to enable individuals to distinguish and track middle-sized, integrated bodies. He and most other prominent philosophers in the second half of the previous century thought that they could explain empirical objective representation without thinking seriously about perception. Quine's standpoint stemmed from confidence that he held a philosophical position that showed that any empirical work that treated prelinguistic individuals as representing bodies as such must be mistaken. In fact, the strictures that he, Davidson, Strawson, and others place on reference and representation are not philosophically strong. They are also empirically untenable.

Most of Quine's confidence lies not in argument, but in assumption—particularly the assumption of a requirement on intelligibility. This is the requirement that the individual must be able to represent in general form basic conditions on objective reference. The requirement is not self-evident. It is responsibly ignored in empirical psychology. I think it safe to count it mistaken.

IV.

I now sketch a standpoint that takes objective representation of physical entities to be a primitive capacity—widespread among animals and present almost from the start of human development. The capacity does not emerge from a preindividuating representational muddle. The problem of explaining how objective representation emerges in propositional thought is not that of explaining how propositional-conceptual abilities (or linguistic abilities) make objective representation possible. Such representation, including singular objective representation, is present in unaided perception. I want to elaborate on the objectivity present in perception itself.

There is a tradition in philosophy, and in pockets of psychology, that deflates the notion of representation. Reliance on such deflationary conceptions would raise a serious question whether criticism of Individual Representationalism that uses them would simply change the subject. On such conceptions, it becomes an easy point that "representation" does not require the various capacities required by Individual Representationalists. For example, one can trivially attribute representational states to artifacts like boat pumps. The pump "represents" that water has reached a certain level in the hold of the boat. Since its function is to clear the boat of water, it starts pumping. It stops when it represents that water has fallen

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below a certain threshold. Explanation of the function and operations of the pump need not attribute representational states to the pump. Such attribution, though sometimes convenient, is explanatorily trivial: it adds nothing to explanation or understanding.

A more systematic and serious deflationary approach takes any systematic causal or counterfactual mapping relation between organism and world that has a natural function for an organism to be representation.⁵⁴ On this view, the differential sensing of light or heat spectra by amoebae, sensitivity to warmth in a reptile's body, and sensing up or down in an earthworm are instances of representation.

In response to such deflationary approaches, Individual Representationalists might protest that their claims are based on a richer conception of representation. Relative to that conception—they might hold—their claims are not hyperintellectualized at all.

I think that it will be clear that my notions of representation and perception do not support such protests. I use a richer conception of representation. But a larger point should be noted. My views about these notions are not crucial to the issue over Individual Representationalism. I believe that there is *no* reasonable general conception of representation that fits the key claim of the Individual Representationalists that I have discussed. None of the Individual Representationalist positions are supported for *any* notion of representation. The key claim is that to represent elements in the physical environment, an individual must have resources that can represent general conditions on objectification. Perceptual anti-individualism and empirical science show this requirement to be gratuitous.

54. This conception of representation can be found in Fred Dretske, *Naturalizing the Mind* (Cambridge, MA: MIT Press, 1995), chap. 1, and in Charles R. Gallistel, *The Organization of Learning* (Cambridge, MA: MIT Press, 1990), chaps. 1 and 2. Dretske tries to distinguish within this very broad conception of representation a narrower notion that applies to psychological representation. For more development of his view, see his "Misrepresentation," in *Belief, Form, Content, and Function*, ed. R. J. Bogdan (Oxford: Oxford University Press, 1986); *Explaining Behavior* (Cambridge, MA: MIT Press, 1988). I believe that Dretske's attempt to explain a narrower species of representation in terms of the broader one does not succeed. But I shall have to reserve discussion for another occasion. In work that antedates his attempts to provide deflationary notions of representation, Dretske offers an illuminating set of intuitive considerations that, though not directly opposed to Individual Representationalism, are congenial to, but different from, the considerations that I emphasize in the present essay. See Fred Dretske, *Seeing and Knowing* (London: Routledge and Kegan Paul and University of Chicago Press, 1969).

I count the low-level sensings of elements in the physical environment that I have just cited, sensings such as the amoeba's, as *registration of information*, but *not* representation.⁵⁵ The key to recognizing a distinction lies in noting that having veridicality conditions, a constitutive feature of perception and representation, plays no substantive role in scientific explanations of the operations of these sensory states. Sensory information registration per se lacks constitutive association with veridicality conditions.

I take perception to be a type of *objective sensory representation*. I will explicate the notions of objectivity and representation that inform this characterization.⁵⁶

Representation is a phenomenon constitutively associated with veridicality conditions. The practice of perceptual psychology rests, partly, on an explanatory paradigm that makes attribution of states with specific veridicality or accuracy conditions fundamental to its explanations. This practice marks attribution of genuine representation.

The explanatory paradigm has been most richly developed in the theory of vision. The theory is an account of how individuals see. Seeing is a kind of veridical representation. The theory begins by observing that detectors in the retina are sensitive to the effects of arrays of light frequencies. Its main problem is to explain how perceptions of the environment are formed from registrations of distributions of such light arrays. There are other sources of input into visual systems—proprioceptive input, input from other senses, top-down cognitive input in some cases. Our discussion can engage in simplification. Indeed empirical explanation often brackets these further sources of input, to be reintroduced at finer-grained stages of explanation.

55. If a state or condition *A* is a regular or nomological or counterfactually supported consequence of a state or condition *B*, *A* carries information about *B*. *A* registers information about *B* if it functions to carry information about *B*.

56. This explication is not a definition. The explication is not sharp enough to distinguish perception from some imagery or from perceptual memory. The distinctions have to do with relations between the representation, causation, time, and purported objects of representation. I believe that these distinctions depend on the type of sensory representation involved. I will not have room to discuss the notion of *sensory* representation here. I believe that a further necessary condition on a perception is that it be a state of the individual's. Both discussion of the exact sense in which I intend this condition and argument for the condition's holding will have to be reserved for another occasion. See *Origins of Objectivity*. I will focus here on brief discussions of the notions of *objectivity* and *representation*. The basic conception of perception that I adumbrate is part of a tradition in psychology that goes back to Kant.

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The information available in registrations of arrays of light frequencies on the retina significantly underdetermines the environmental distal causes of those registrations. It underdetermines the particulars that are perceived and the types that are perceptually attributed. The same kinds of proximal stimulations could have been produced artificially, with no normal environmental antecedents at all. Or they could have been produced by different distal antecedents. Further, many distal causal antecedents always figure in stimulations of the retinal detectors. The perceptual system can only respond to proximal stimulations. But the individual perceives—and the visual system contains representations of and as of—specific distal causal antecedents in the environment, even though there are numerous actual and possible antecedents that are causally compatible with the kinds of proximal stimulation.

Not all psychologically relevant states of the visual system are perceptual states. Not all information is perceptual. Arrays of light intensity are registered on the retina and encoded in the visual system. These encodings carry information, but are not perceptual representations. Light intensities registered on the retina are not perceived.

The fact that identical (or for-the-perceptual-system indiscernible) types of light array are the possible products of different types of environmental antecedent motivates the paradigmatic problem of the psychology of vision. The paradigmatic problem, to repeat, is to explain how information contained in these arrays is converted into perceptions of, and as of, entities in the distal environment. A central aspect of this problem is to explain transformation of the registrations of light intensities—a two-dimensional array—into perceptions of, and as of, entities in three-dimensional space. What makes the problem difficult is that the retinal registrations, together with all further proximal input, underdetermine distal causes—even physically possible distal causes. What has made the problem empirically worthwhile is that all perceptual systems exhibit a complex set of factors and principles that help explain the transition from registration of proximal stimulation to perceptual representation.

Psychology takes the visual system to operate under principles for forming perceptions. These principles describe operations that convert initial registration of proximal stimulation (or later processings of proximal stimulation), and other input into the perceptual system, into perception as of the environment. In effect, the operations privilege certain possible distal causes of the given proximal stimulation over others, as perceptual *representata*. The operations make the underdetermining proximal stimulation produce a perceptual state that represents the distal cause

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to be exactly one of the many possible types of distal causes that are compatible with the given proximal stimulation.⁵⁷

These operations yield perceptions that are underdetermined by information conveyed by initial proximal stimulation. So they are subject to error. They have inductive import, although the way the principles operate can be taken to have the form of deductively applied conditionals (“If the registration of proximal stimulation is of type P, a perception as of an F is formed”).

Explanation of representational success and failure—explanation of how animals perceive veridically to the extent that they do—has been a source of fertile empirical theory. The success of such a science gives ground to believe that this form of explanation describes distinctive and important psychological kinds—perceptual representational states. Light sensors in *Euglena*, contact sensors in flatworms, shadow sensors in molluscs, proprioceptive feedback on self-motion in dragonflies, sensitivity in paramecia to certain ranges of concentration of sodium chloride, the hearing of the pocket gopher (which cannot localize sounds) appear to be nonperceptual sensory systems.⁵⁸ Similarly, sensory systems in adult humans that affect muscle tone and vascular constriction, many of our systems for balance, probably most or all aspects of the sensory systems for smell and taste, and various *aspects* of even perceptual systems (like registration of light arrays in the visual system) are not perceptual or representational.

Explaining these low-level sensory systems in representational terms is unilluminating and dispensable. No nontrivial invocation of veridicality conditions plays a role in the explanations. In many cases, good

57. These points can be found in any mainstream textbook. See Stephen E. Palmer, *Vision Science* (Cambridge, MA: MIT Press, 2002), pp. 9–11, 18–24, 55–59, 247–48. I am vastly oversimplifying the situation. There are many types of transition between sensory states in a perceptual system, whether the states are both nonperceptual, one is nonperceptual and the other is perceptual, or both are perceptual. An adequate feel for the science requires direct exposure to it.

58. Discussion of these cases can be found respectively in: N. Tinbergen, *The Study of Instinct* (New York: Oxford University Press, 1969, with new introduction; originally published 1951), 21; H. S. Jennings, *Behavior of the Lower Organisms* (Bloomington: Indiana University Press, 1962; first published 1906), 47–54; Dan R. Kenshalo Sr., “Phylogenetic Development of Feeling,” in *Handbook of Perception*, ed. Edward C. Carterette and Morton P. Friedman (New York: Academic Press, 1978); Bernhard Möhl, “Sense Organs and the Control of Flight,” in *Insect Flight*, ed. Graham J. Goldsworthy and Colin H. Wheeler (Boca Raton, FL: CRC Press, 1989); Rickye S. Heffner and Henry E. Heffner, “Evolution of Sound Localization in Mammals,” in *The Evolutionary Biology of Hearing*, ed. Douglas B. Webster, Richard R. Fay, Arthur N. Popper (New York: Springer-Verlag, 1992).

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explanation centers on the discriminative sensitivity to proximal stimulation, weightings of registrations of such stimulation coming from different bodily sensors, capacities for adaptation or conditioning, neural pathways from input to output and the laws governing them, and the biological (or artifactual) function of the system.⁵⁹

One can count a sensory registration mistaken if one wants. But doing so comes to no more than that the sensory state did not serve the organism's needs. "Mistake" is nothing more than misfortune.⁶⁰ We seem not to need a notion of representation or a notion of perception to explain a paramecium's or a snail's sensory systems. We do need such notions—individuating to states with veridicality conditions—to explain vision in mammals and many other animals.

Since veridicality conditions play no substantive role in the explanations of some sensory systems, a nondeflated notion of "representation" finds no purchase in these explanations. By contrast, veridicality conditions enter into the explanatory kinds and paradigmatic explanations of the visual capacities of a wide variety of animals. The notions of representation and perception are part of a distinctive, powerful form of explanation. Specification of states with veridicality conditions enters into the specification of laws and lawlike patterns that are represented in scientific explanation. This type of explanation has attained some mathematical rigor and is supported by considerable interlocking experimental work. In understanding perception, I use the notion of *representation* in a way that requires a nontrivial, substantive role for veridicality conditions in kind-determination and in empirical explanation.

In what way is perception *objective* sensory representation? Objective sensory representation represents what is in fact a mind-independent

59. Ordinary language sometimes portrays the taste of wine or the smell of banana as perception. I believe that such cases are usually to be assimilated to belief and propositional memory derived from nonperceptual sensory states. At least in the overwhelming majority of such cases, the representation is not at the purely sensory level. The sensory system responds to certain types of proximal stimulation that in fact come from such things as wine or bananas. Nonperceptual sensory discriminations can be either generic or very fine-grained. But excepting some special cases that I will not discuss here, I know of no perceptual constancies in the gustatory and olfactory sensory systems themselves. Scientific accounts of their operations do not, for the most part, appeal nontrivially to sensory states with veridicality conditions. So I believe that ordinary language tends to blur natural psychological kinds.

60. Mistake does not in general coincide with misfortune. So the gloss on error that I am alluding to, which is quite popular in purportedly reductive accounts, is a source of much confusion. I discuss these matters in more detail in *Origins of Objectivity*.

physical subject matter as having some of the attributes that it in fact has. Objectification is not the product of an ability to represent conditions on objectivity. It is the product of subindividual, modular abilities and their constitutive content-determining relations to an environment beyond the perceiver. What makes perceptual psychology work—what makes explanation in terms of representational states with veridicality conditions fruitful—is the complexity and systematicity in a system's operations. This complexity and systematicity makes psychology's solving its underdetermination problem explanatory and illuminating. Solution to that problem cites processes that systematically filter proximal stimulation that is not likely to correlate with relevant environmental conditions in order to produce probable *specific* correlates of *specific* environmental attributes.⁶¹ Proximal stimulations are processed to provide a perceptual model of the world, as distinct from (sometimes even quite complex, flexible, and weighted) informational and functional responses to stimulation of the individual's surfaces.

There are processes in the individual's perceptual system that are explained in terms of their role in distinguishing aspects of proximal stimulation that are likely to be idiosyncratic to the subject or context from aspects that are likely to map environmental reality. This systematic distinguishing is the objectification distinctive of perception.

A perceptual system achieves objectification by exercising *perceptual constancies*.⁶² These are capacities systematically to represent a given particular, property, relation, or kind as the same, despite significant variations in registration of proximal stimulation. For example, despite significant variations in illumination, we and many other animals can visually perceive a color as the same. Or we can see an entity as being of a specific size while taking up more or less of the visual field. Or we can determine distance despite substantial differences in what is perceived at that distance. The proximal light arrays do not in themselves (even taken sequentially) suffice to distinguish among different types of possible environmental causes. They cannot alone determine a single objective

61. The presence of such filters is amply established empirically. Whether the distinguishing of environmental reality from the registration of proximal stimulation could take some other form, I leave open.

62. I think that, suitably characterized, perceptual constancies are necessary as well as sufficient for perception, and hence for perceptual objectivity. The phenomenon must be allowed to be intermodal. Here it suffices to cite constancies as a paradigmatic mark of perception.

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property under different conditions. The constancies are marks of objectification.

Not all selectivity with respect to registration of proximal stimulation constitutes the selective privileging operations that overcome underdetermination and that are involved in a perceptual constancy. Some neglect of noise occurs in any well-functioning sensory system, perceptual or not. Nonperceptual sensory systems suppress some information in a signal to respond to information useful to the organism. Heightened responsiveness to select aspects of a signal is one product of conditioning. All animals, no matter how simple, can adapt through habituation or conditioning. All such adaptation occurs under the pressure of objective circumstances. Adaptation in protozoa is as much under such pressure as learning in organisms with perceptual systems.

Genuine perceptual systems are distinctive in exhibiting structure and system in the privileging operations, and specificity of the filtering to various specific environmental attributes. Systematic, repeatable, diverse principles for objectification fitted to specific aspects of the environment govern the competencies of a perceiver. These structures differ from the serial, piecemeal, averaging adjustment to proximal stimulation of nonperceptual sensory systems. Such structure and system are marks of perceptual objectification. Of course, what is basic is not complexity, system, or structure per se. What is basic is the existence of perceptual kinds with veridicality conditions that achieve the objectification, the attribution of attributes of a mind-independent or nonperspectival environment, that is exhibited in perceptual constancies.

There are surely borderline cases between perceptual systems and those sensory systems that merely register information. What is striking is that different forms of explanation are empirically fruitful as applied to many clear examples of the two cases.

The biological and information-theoretic forms of explanation that apply to nonperceptual systems remain available and applicable to individuals with perceptual systems. But an additional form of explanation is explanatory as well. This form appeals to representational content as marking conditions for veridicality—in this case, perceptual accuracy or correctness. Veridicality is success in fulfilling, not a biological function, but a representational function.⁶³ The applicability of this type of

63. Representational success and failure are signs of representational functions that are fulfilled or not fulfilled. As noted, such representational functions must be distinguished from biological functions. Natural standards for success or failure constitute

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explanation is supported by the system and specificity found in the objectifying structures present in the perceptual constancies.

What is the phylogenetic distribution of perceptual systems?

Some arthropods have visual perceptual systems. Much of the work on arthropods concentrates on bees. But there is also remarkable work on the visual perceptual systems of locusts and a few spiders, principally jumping spiders. Bees have fairly good color vision, with color constancy. Bees, some spiders, and locusts are known to exhibit distance and location constancy. Bees and jumping spiders exhibit size and motion constancy as well.⁶⁴

The visual systems of many birds have the basic spatial constancies, and in some species color constancies. Much of the study of birds centers on their navigation in homing and migration. Birds use not just vision but other senses—olfaction, sensitivity to magnetic fields. Still, many birds use vision in navigation, supplemented by allocentric maps centered on the sun or stars. As noted earlier, object constancy has been found in chicks and various other birds.⁶⁵

representational norms. Such norms do not depend in any way on someone's setting them or representing them, any more than biological functions and standards (such as nutritional standards) for fulfilling them depend on individual's setting goals or representing what would be good for them. See my "Perceptual Entitlement," secs. 1 and 2, and "Primitive Agency and Natural Norms," forthcoming in *Philosophy and Phenomenological Research*.

64. Georgii A. Mazokhin-Porshnyakov, *Insect Vision*, trans. R. and L. Masironi (New York: Plenum, 1969); G. Mazokhin-Porshnyakov, "Recognition of Colored Objects by Insects," in *The Functional Organization of the Compound Eye*, ed. C. G. Bernhard (Oxford: Pergamon Press, 1966); Randolph Menzel, "Spectral Sensitivity and Color Vision in Invertebrates," in *Comparative Physiology and Evolution of Vision in Invertebrates: Invertebrate Receptors*, ed. H. Autrum (Berlin: Springer-Verlag, 1979); Christa Neumeier, "Comparative Aspects of Color Constancy," in *Perceptual Constancy*, ed. V. Walsh and J. Kulikowski (Cambridge: Cambridge University Press, 1998), 323–51; R. Wehner, "Spatial Vision in Arthropods," in *Comparative Physiology and Evolution of Vision in Invertebrates: Invertebrate Visual Centers and Behavior*, ed. H. Autrum (Berlin: Springer-Verlag, 1981); R. Stimson Wilcox and Robert R. Jackson, "Cognitive Abilities of Araneophagic Jumping Spiders," in *Animal Cognition in Nature*, ed. R. P. Balda, I. M. Pepperberg, A. C. Kamil (San Diego: Academic Press, 1998); Rainer F. Foelix, *Biology of Spiders* (Oxford: Oxford University Press, 1996), 87–92; T. S. Collett, "Peering: A Locust Behavior for Obtaining Motion Parallax Information," *Journal of Experimental Biology* 76 (1978): 237–41.

65. W. Wiltschko and R. Wiltschko, "Magnetic Orientation and Celestial Cues in Migratory Orientation" in *Orientation in Birds*, ed. Peter Berthold (Basel: Birkhauser Verlag, 1991); Peter Berthold, "Spatiotemporal Aspects of Avian Long-Distance Migration," in *Spatial Representation in Animals*, ed. Sue Healy (Oxford: Oxford University Press, 1998), 103–18; Pepperberg and Funk, "Object Permanence in Four Species of Psittacine Birds,"

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Work on the visual systems of reptiles, amphibians, fish, and cephalopods is more limited. Basic constancies utilizing spatial representation have, however, been demonstrated in the visual systems of frogs, fish, and octopi.⁶⁶

The visual systems of nonhuman mammals are fundamentally similar to those of humans. They tend not to be as acute or as versatile. Nevertheless, they exhibit all the primary visual constancies that human vision does.

I have concentrated on the phylogenetic distribution of *visual* perception. Although vision is the most impressive and widely studied perceptual system, there are certainly others. Many types of hearing exhibit localization of sounds, which entails perceptual constancies. In barn owls nonhorizontal placement of the ears and interaural phase and time differences between reception of sound in the two ears makes possible localization. Human hearing relies on similar principles for comparably accurate sound localization. The principles governing hearing resemble those that govern localization by convergence in vision.⁶⁷ Similar sorts of localization occur in a variety of echolocation sonar systems in bats, dolphins, and whales.⁶⁸

Triangulation and timing are also used in tactile sense-perceptual systems. The sand scorpion's system uses differences in timing of the arrival of vibrations through the sand to each of its eight legs to compute

322–30; W. Wiltschko and R. Wiltschko, "The Navigation System of Birds and Its Development," in *Animal Cognition in Nature*, ed. Russell P. Balda, Irene M. Pepperberg, Alan C. Kamil, Regolin, Vallortigara, and Zanforlin, "Detour Behavior in the Domestic Chick"; Neumeyer, "Comparative Aspects of Color Constancy"; Irene Maxine Pepperberg, *The Alex Studies* (Cambridge, MA: Harvard University Press, 2002), chap. 10; B. Pollok, H. Prior, O. Guntrunkun, "Development of Object Permanence in Food-Storing Magpies (*Pica pica*)," *Journal of Comparative Psychology* 114 (2000): 148–57.

66. D. Ingle, "Perceptual Constancies in Lower Vertebrates," in *Perceptual Constancy*, ed. Walsh and Kulikowski; D. Ingle, "Shape Recognition in Vertebrates," in *Handbook of Sensory Physiology*, vol. 8, ed. Held, Liebowitz, and Teuber (Berlin: Springer-Verlag, 1978); V. A. Braithwaite, "Spatial Memory, Landmark Use, and Orientation in Fish," in *Spatial Representation in Animals*, 86–102.

67. Georg M. Klump, "Sound Localization in Birds," in *Comparative Hearing: Birds and Reptiles*, ed. Robert J. Dooling, Richard R. Fay, Arthur N. Popper (New York: Springer-Verlag, 2000).

68. H.-U. Schnitzler and O. W. Henson Jr., "Performance of Airborne Animal Sonar Systems I. Microchiroptera," in *Animal Sonar Systems*, ed. Rene-Guy Busnel and James F. Fish (New York: Plenum Press, 1980); Arthur N. Popper, "Behavioral Measures of Odontocete Hearing," in *Animal Sonar Systems*, ed. Busnel and Fish.

the location of a disturbance in the sand.⁶⁹ Thus distance and location constancies occur in such tactile systems. Spiders probably use such means to locate prey in their webs. The less exotic tactile systems of land mammals, including humans, that rely primarily on contact yield texture and shape constancies.⁷⁰

The foregoing phylogenetic survey illustrates the spread and primitivity of objective perceptual representation of physical entities fundamental to animal life. The survey shows how far from reality second-family forms of Individual Representation have been.

I turn to one further philosophical issue. Perceptual objectivity certainly does not depend on a capacity to represent bodies. But since discussion of bodies looms so large in Individual Representationalist work, I will discuss constitutive conditions for perceptual representation of bodies as such. The conditions bear comparison with the requirements laid down by Quine and Strawson. Some of their requirements find analogs at lower representational levels.

To represent bodies as such, an individual's perceptions must be able to distinguish bodies from events, colors, shapes, and motions, which also occur in the normal environment and that figure in biological explanations of the individual's basic activities. To represent bodies as such, the perceptual system must distinguish bodies from other environmental types that meet the foregoing condition. There is, however, no requirement that the system distinguish a given type from all other types, or that perceptual attributives fit into a system of propositional inference.

To represent anything as a body, an individual or system must be able to perceptually distinguish bodies when more than one body is perceived. However, there need be no analog of negation or plurals, much less a mastery of identity thoughts, quantification, or general principles of counting.

Representing bodies as bodies requires an ability to track a body over time. Lacking this ability, an animal could not discriminate bodies from events. Similarly, there must be a ground in the operations of the perceptual system for distinguishing bodies from shapes.

69. P. H. Brownell, "Prey Detection by the Sand Scorpion," *Scientific American* 251 (1984): 86–97; discussed in Gallistel, *The Organization of Learning*, 110–12.

70. David Katz, *The World of Touch*, ed. and trans. Lester E. Krueger (Hillsdale, NJ: Lawrence Erlbaum, 1989; originally published in 1925 as *Der Aufbau der Tastwelt*), 85; R. L. Klatzky, S. J. Lederman, V. A. Metzger, "Identifying Objects by Touch: An Expert System," *Perception and Psychophysics* 37 (1985): 99–302.

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The principle governing these requirements is always that to represent bodies as such, an individual and its perceptual system must be able to discriminate them from other entities *that are relevant to biological explanations of its needs and activities in its normal environment, the environment by reference to which its representational content is explained*. The system need not be able to distinguish them from all possible entities.

To represent bodies, a perceptual system must treat them as *loci* of other properties—shape, motion, color. It must be capable of contextual spatial localization and representation of spatial relations. Spatial organization in actual perception is inevitably egocentrically indexed.⁷¹

I think that there is no sound argument for the Strawsonian view that the individual must also have a comprehensive allocentric spatial map—or an ability to track its own body in such a scheme. The view is hyperintellectualized.⁷² It would be a mistake, however, to think that allocentric spatial maps are an achievement available only to humans. Maps in memory with origins on the sun, stars, or a nest, for example, appear to be common in many birds and other vertebrates.

A similar point applies to temporal schemes. Egocentrically centered temporal representations are needed for representing timing for any activity. But many animals with egocentric temporal schemes also have allocentrically centered ones. Many temporal schemes are keyed to rhythms of nature. The circadian cycle and seasonal cycles ground allocentric systems.

The individual need not be able to represent differences between bodies, on one hand, and masses, undetached object parts, abstract kinds, temporal stages, on the other. The entities in the environment that figure in biological explanations of basic animal functions (mating, eating, navigating) help fix a representational state as having a certain content even

71. There are amodal allocentric spatial representations in the psychologies of many animals. These coordinate with and serve perceptual egocentric spatial representation in various ways. But all actual perceiving is necessarily from the egocentric perspective of the perceiver.

72. I have not separately discussed the neo-Kantian claim that to engage in objective reference, or perhaps representation as of bodies, one must represent causal relations as such. I believe that arguments for such views are just as weak as the arguments that I have discussed here. Moreover, there is considerable evidence that a wide variety of animals represent physical bodies in perception, but no evidence, that I know of, that all such animals (or even many of them) represent causal relations as such. I believe that research even on human children has not shown that representation as of causal relations occurs as early as representation as of bodies, much less is conceptually or psychologically necessary for representation as of bodies.

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though the individual lacks the ability to differentiate the relevant kind from philosophically contrived alternatives. Since macro bodies are fundamental in biological explanations of realization of many animal functions, they are fundamental in accounts of perception, assuming that an animal can perceptually distinguish them from other properties and kinds that play similar roles in biological explanations.

It hardly need be said that representation of bodies as such does not require representation of mind-independence or a seems-is distinction. Children perceptually group bodies as bodies before they have representations as of mind-independence. Few if any nonhuman animals represent mind or mind-independence. Physical bodies *are* mind-independent, of course. We come to understand this point once we acquire the concepts needed to understand the issue. Perceiving and conceiving bodies does not depend on understanding the point. Children's representations are realist in this basic sense: they represent what is in fact a mind-independent or nonperspectival reality, and they do so without presupposing any reference to mind. Children and animals are realists not because they represent bodies as mind-independent, but because they cannot help but ignore idealism. We as philosophers should emulate the children.

The view of perception presented here constitutes a step toward a less intellectualized conception of objective representation that fits what is known about perception in the animal kingdom. The conception starts with a distinction between sensory *perception* and sensory states that lack veridicality conditions or capacities for objectification.

Perception, hence objective representation, is not a sophisticated achievement. Objectivity is a starting point for representational systems. It need not be propped up by propositional abilities. Objective representation, even of bodies as such, is not special to human beings. Philosophy in this century would do well to elaborate a more realistic account of representation of the physical environment. With such an account, we will be in a better position to understand what is really special about human representational capacities.