of some general, repeatable grouping capacity to attribute properties, relations, kinds veridically.\textsuperscript{39} The nature of these general capacities is our primary concern. What capacities must attend attribution of the kind body?

\textsuperscript{39} In the articles cited in note 36 and in \textit{Seeing and Visualizing}, Pylyshyn holds that the particular-tracking, context-bound, singular applications, which he calls employed indexes, are not accompanied by any representation that ‘encodes’ a property. In \textit{Seeing and Visualizing}, see pp. 180–181, 200, 202, 208–214, 217–222. I believe that this doctrine is untenable. I will not discuss the difficulties in detail. But, since Pylyshyn is widely read among psychologists and philosophers, I lay out some basic points. Pylyshyn insists that the objects initially picked up by the visual system are not guided by “conceptual” representations—representations that occur in all-purpose, non-modular aspects of cognition. In this insistence, he is certainly right. (See his excellent article ‘Is Vision Continuous with Cognition?’.) His account of vision associated with the indexes, however, never discusses or even recognizes attributive (or grouping, categorizational) general aspects of visual perception that is the product of modular processing—visual perception proper. In fact, he sometimes identifies representational encodings of properties with conceptual capacities—capacities that are not attributable to the visual system per se (\textit{Seeing and Visualizing}, 216, fig., 219 n.).

Pylyshyn also holds that reference in perception does not occur purely through descriptions or attributes (pp. 245–247, 252–254), that reference in perception does not depend on sorts for familiar natural kinds (p. 215; see note 40 below), and that some contextual singular reference in perception does not succeed in locating the representatum or in associating ordinary properties with it (pp. 219–221). In all these points, he is correct. But in making them, he often writes as if he is vindicating his own doctrine. None of these points provides the slightest positive support for that doctrine. The doctrine at issue is that perceptual singular context-bound reference to distal particulars (‘objects’) sometimes occurs without any representational encoding of any property (as) of a particular, where an encoding enters into computations (p. 218).

Pylyshyn holds that the indexes are tied to their referents causally (p. 213), but that they are initially guided by no attributive that encodes any property. He tries to explain how indexes can refer without being accompanied by representational encodings of properties (or other attributes) by appealing to various supposed analogies (pp. 218–221). None of these analogies helps makes his view plausible. ‘Interruptions’ in computer programs affect the programs causally without matching a descriptor to the causing event (pp. 218–219). There is no evident need to regard the interruption as referring to anything. If interruptions are supposed to refer to distal particulars, it is just as unclear how they can do so as it is how indexes (or context-bound singular applications) can do so, in the absence of perceptually representing the object as being of a certain sort or as having certain properties. The other supposed analogies are no more helpful.

Pylyshyn (at least sometimes, see note 36) takes the indexes to refer to particulars in the distal environment. Such particulars need not be bodies, but I will take bodies as paradigmatic. This view is surely correct. But, insofar as an index refers to a distal particular, the reference must be through a perceptual ability. The particular is picked out only by perception. Such perception involves some general, repeatable ability that responds to an \textit{environmental} pattern. Motion and object constancies are clearly present in the empirical experiments that deal with indexes. The relevant responses group, categorize, or attribute. Pylyshyn often writes as if the visual system perceptually picks out bare particulars. It is certainly striking (as we have seen and shall see again) that many familiar properties need not be perceptually tracked or represented when bodies are tracked. But one cannot perceive a particular in the environment \textit{neat}. This is impossible on its face. One must segment it from the rest of environmental reality in terms of repeatable patterns—attributes. (Here I think Pylyshyn’s failure in his earlier writings firmly to indicate that the \textit{representata} of the indexes are distal objects, paradigmatically bodies, figures in his tendency to think of indexing as a representation as of bare particulars.) Sometimes Pylyshyn writes as if the category \textit{objecthood} or \textit{individuality} (pp. 215, 226–227) might be associated with the index. But these categories are too unspecific to stand alone. They cannot explain what environmental patterns the perceptual system uses (perceptually) to isolate specific objects (or individuals) from other elements in the perceived environment. Just saying that the index refers to its cause, or picks out an object because of a proximal onset of stimulation, as Pylyshyn often does, is also too unspecific. There are always many causes, and many causally relevant aspects of any given cause. To refer to a particular, the system must isolate it by perceiving and perceptually
The capacities constitutively relevant to having the perceptual capacity to attribute the kind *body* are conveniently divided into synchronic and diachronic types.

A traditional philosophical view is that to represent bodies, the individual must segment physical reality into relatively narrow kinds of objects—balls, trees, rocks, bees, and so on.\(^{40}\) These are called *sortals*. The view is often presented as an apriori claim about conditions for representation of physical reality. This view does not accord with facts concerning child development or the perceptual capacities of various animals. Visual capacities for many individuals delimit kinds at a much more generic level of kind attribution.

Whether bodies have simple, regular, or common shapes is not initially important for visual segmentation. There is extensive and varied evidence that children as young as 2 months old visually represent bodies according to individuative principles that are very generic and that center on a few aspects of bodies.\(^{41}\) The individuative abilities are probably innate, in the sense that they are the products of a maturation that is normal for the species and does not depend on the specifics of individual learning. Cohesive, bounded objects of any shape are perceptually segmented from a background, and treated differentially.

The capacity to perceptually discriminate a three-dimensional figure from a background or surround is a relatively primitive synchronic perceptual capacity. I think that this capacity is apriori constitutively necessary to visually representing bodies as such. An individual that lacked this capacity could not see anything as a body. The same capacity is apriori constitutively necessary to perception as of attributing some aspect of it that distinguishes it from other elements in the environment. What perceptual response to what aspects of the cause explains the repeatable perceptual ability to single out particulars of the types that are in fact singled out? Psychology needs to (and does) explain what attributes of the distal causes the perceptual system perceptually responds to in picking out the particulars, the objects, that it picks out and tracks. (I explain this point in much greater depth in section II of ‘Five Theses on *De Re* States and Attitudes’.) Pylyshyn never considers this psychological issue. He does note, without seeing its relevance to his doctrine, that there are very specific aspects of the environment that perceptual systems perceptually represent that allow for discrimination and tracking of objects.

A lot is known about how such perceptual attributions of properties, relations, and kinds are computationally formed and used to pick out and track particulars. For example, for visual indexes that track bodies, the objects must be seen as wholes (in the distal environment); and the objects cannot be seen to be shrinking or growing in certain ways. Properties like spatial boundedness, spatial integrity, and continuity in motion are properties whose representation guides indexes for bodies. Oddly, in one passage, Pylyshyn comes close to recognizing these points, but fails to apply them to his doctrine, becoming concerned with whether the attributives are conceptual (pp. 266–267). (In beings with concepts, such attributives are surely both perceptual and conceptual.) Perceptual representations as of other properties guide singular indexes that pick out and track other particulars besides bodies, for example, tunes and object-like patterns that are not perceived as objects.

It is not tenable empirically, or I think even conceptually, to hold that the indexes carry out demonstrative-like perceptual reference to distal particulars that is not guided by any general perceptual representational types at all. See ‘Five Theses on *De Re* States and Attitudes’, sections II and III.

\(^{40}\) Wiggins, *Sameness and Substance*. We saw this sort of view in Strawson and Quine, as well.

\(^{41}\) Spelke, Brelinger, Macomber, and Jacobson, ‘Origins of Knowledge’.