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## Perception, Conception, and Infant Self-Awareness

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The idea that humans begin life somehow undifferentiated from their environment has had a compelling fascination for psychological theorists. In the ideas of theorists as diverse as Helmholtz, Freud, and Piaget, some version of this idea can be found. Initially, the infant is said to lack some demarcation between itself and the world, failing to understand the difference between its own actions and events in the world, its own boundaries and those of objects, or its own needs and desires and those of others.

Butterworth does a great service by reexamining the issue of self–other differentiation from an ecological perspective. This reexamination is typical of recent work in early cognitive development in taking as its departure point a relatively new appraisal of infant perception. From this perspective, which owes much to an ecological approach, perceptual systems are seen as having evolved to pick up information about the environment and the self within that environment. The infant's perceptual abilities may not be as precise or as versatile as the adult's, but their function is the same. An earlier view, shared by most if not all theorists who viewed infants as “undifferentiated” from the environment, held that the senses initially deliver to the infant only meaningless sensations. From this starting point, it would be hard to ascribe an initial self–world discrimination to infants, especially one rooted in perception. The widespread belief in initial nondifferentiation has been more or less a default hypothesis. It surely has not been carefully connected to empirical observations.

The possibility entertained by Butterworth, that self-perception is grounded in early perceptual activity, is not only compatible with, but might be expected from an ecological approach. Complex perceptual systems are the property only of mobile organisms. Tasks such as perceptual control of posture and locomotion, as well as detection of relations between the self and other entities, are fundamental. Moreover, analyses of the optic array suggest that information is available to specify with high accuracy many aspects of self-motion and position, object motion, and spatial relations. One might imagine evolved perceptual systems that do not initially make use of such information, but it is much easier to imagine the opposite. The empirical evidence reviewed by Butterworth suggests that the self and the world are distinguished by infants early on.

### Perception Versus Conception

Given the likelihood of an intrinsic foundation for differentiating the self and the world, what sense can we make of young infants' failures on more advanced tasks, such as the rouge-removal task? It is here that I am not as comfortable with the analysis presented. Butterworth is careful to note uncertainties of interpretation, but he favors the view that initially, the young child has only *perceptual* representations of self, and that qualitatively different *conceptual* representations emerge with further development.

This distinction is best approached cautiously. It has taken a long time for psychologists to move from sensationist characterizations of infancy to perceptual ones. Sensationists attributed to the infant not knowledge, but something preliminary to knowledge—that is, sensations. There is now ample evidence that an infant's perceptual systems place her in meaningful contact with the world from very early on. But is there something preliminary about this knowledge? Can it be characterized as *merely perceptual* and thus not quite *real* knowledge, much as an earlier approach found the contents of the infant's mind to be *merely* sensory? In attributing perceptual knowledge that is not conceptual, I wonder if we are not on the verge of replaying the sensation versus knowledge script, which, however interesting, is becoming a bit dated.

Is there reason to believe in a perceptual–conceptual shift? One concern is that some arguments appear to furnish reasons by shifting the term “perceptual” to mean “sensory.” This happens to some extent in the target article. For example, in discussing Mounoud and Vinter's (1981) proposed revisions of Piaget's theory of sensorimotor development, Butterworth refers to the initial stage: “The most basic, and the one that characterizes the initial state of coordination we have been discussing, they call the ‘sensory’ code. This is not the same as Gibsonian terminology but one can see a close affinity.” The affinity here appears to be more with Piaget's sensorimotor stage (and traditional sensationism) than with ecological views of early perception. Development begins with the same old meaningless sensations or images. From such a beginning, later qualitative change would, of course, be necessary. As an argument for qualitative change, however, this view begs the question.

Several decades of infant perception research point to a very different conclusion. Infants *perceive*, meaning they obtain knowledge, not images, through their senses. How might this type of knowledge relate to what Butterworth calls conception? A sensible and widespread view of the outputs of perception is that they are descriptions of the environment (Marr, 1982; Watt, 1988). Such descriptions should be useful in acting and thinking. It is not at all clear that these descriptions are not *conceptual* ones, or if not, how they might differ from conceptual ones. There is reason to believe that perceptual processes are relatively autonomous and insulated from much of our knowledge and beliefs (Fodor, 1983; Marr, 1982). The separability of the *process* of perception from other cognitive activity should not be confused, however, with the claim that the representations (outputs) from perception are somehow more primitive than or different from conceptual ones.

If there is some useful distinction to be made between the outputs of perception and conceptions, it appears to need further elaboration. One argument given by Butterworth for a developmental shift involves perceptual illusions that are taken to indicate the lack of "objective, *conceptual knowledge* of self." In "moving room" experiments, a baby may fall despite being "objectively stable." With increasing age, there is some decrease in the disruptive effects of visual information for self-motion; this developmental trend is taken to indicate an increasingly autonomous level of self-control. The inference is not convincing, however. Whatever an infant's conception of self, his or her position in space will be assessed from available information. If visual information is utilized, presenting the nonmoving subject with optical changes may affect posture and locomotion. That crawling infants or adults in a similar situation are less affected suggests a different weighting of visual and vestibular information in perceiving self-motion, not a difference of self-conception.

Butterworth also suggests that "a concept may be defined as a cognitive representation of self, a belief founded on reflective self-awareness." I have already commented on the former part of this definition—that is, on whether the outputs of perception are "cognitive representations." Perhaps the real basis for the distinction Butterworth embraces concerns "reflective self-awareness." Indeed, tasks such as rouge removal seem to have been devised with this notion in mind. Does the fact that infants fail the rouge-removal task, and certain other tasks, until they are well over a year old indicate a lack of a self-concept? It might, but there are plausible explanations for changing performance on these tasks that do not require self-perception up to a certain age and self-conception later. For the sequence of achievements in self-recognition tasks (Butterworth's Table 1), explanations in terms of increasing perceptual skill, memory, specific knowledge, attention, and motivation are readily available. There is scant evidence about what capacities or knowledge are really lacking at each stage. Moreover, in summarizing data as in his Table 1, there is a danger of forgetting that negative results cannot ordinarily be used to infer lack of competence. All that is required to fail a "self-conception" task is for infants of a certain age to be sufficiently uninterested in the task, or focused on the wrong aspect of the situation, or baffled by

some detail not having much intrinsic connection to the self-concept (e.g., a mirror). To go one step further, it is even possible that we have misinterpreted the task entirely in mirror and video experiments. It must not be assumed that detection of the self in a mirror somehow follows logically from (a) knowing one's own appearance and (b) detecting contingent motion between oneself and a mirror image. It is possible that a contingently moving, similar-looking person seen in a mirror *is* another person who just happens to move when we do (a fact noted by such eminent psychologists as the Marx brothers in the movie *Duck Soup*). Our belief that there is not a separate, synchronized, look-alike behind a mirror is grounded in parsimony rather than logic. The possibility of a double, however bizarre from an adult standpoint, may merit substantially more consideration from an infant, who has less knowledge about the sorts of objects and events which tend to occur in the world. If so, the developmental trend in mirror and video tasks may have nothing to do with self-conception but much to do with learning, reasoning, and theorizing about what sorts of things happen in the world.

One must sympathize with the attempt to locate formal landmarks of cognitive change. This particular one, the perceptual-conceptual shift, has become popular lately (cf. Mandler, 1988), especially since an older shift from sensation to cognition has been essentially refuted. Perhaps the insistence on a perceptual-conceptual distinction in representations is an example of the canon sometimes attributed to psychologists that more complex explanations are to be preferred ("Occam's Beard"). More seriously, if such a distinction is to be accepted, it seems to me that more rationale and evidence are needed. It is not enough to find, as appears to be the case with self-perception, that representations become richer and guide more effective behavior with age. Whether initial representations rooted in perception have become elaborated or whether there is some more interesting qualitative difference between the perceptual and conceptual remains to be decided. Likewise, whether age differences in performance on a task reflect reorganization of the self-concept, or some other cognitive advance, must be determined by more than the label the experimenter has applied to the task.

#### Note

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