

## Directly Perceiving Gibson: A Further Reply to Gyr

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In his 1972 critique of direct theories of perception, J. W. Gyr argued from the view that Gibson believes (a) that stimulus structure can *determine* perception and (b) that perceiving as a consequence of voluntary activity is virtually the same as perception that is not a consequence of voluntary activity. Since neither of these assumptions is found in Gibson's approach, Gyr's criticisms do not seem to apply.

Gyr (1972) forcefully criticized James Gibson's direct theory of perception. In his reply, Gibson (1973) argued that Gyr did not address two significant issues. The first is whether or not stimulus information (in Gibson's sense) exists, and the second is whether perception is based on stimulus information or on sensations. Gibson did not choose to correct several blatant misrepresentations of his position that provided the explicit foundation for Gyr's criticism. Since such misrepresentations appear to be common (e.g., Gregory, 1972; Haber & Hershenson, 1973, p. 335), it is important that they be corrected so that future discussion can be founded on substantial issues.

The most glaring error in Gyr's caricature of Gibson's theory is the claim that Gibson believes stimulus structure can cause or determine what an organism perceives. For instance, Gyr interprets Gibson's position as one that maintains that "optic array information is sufficient for predicting a given perceptual process" (p. 248). This is the version of direct perception that Gyr criticizes. However it is not Gibson's version.

Gibson does not believe that stimulus structure causes perception. He could not, for he believes that stimulus structure is indefinitely

rich. An organism cannot conceivably apprehend all the structure available in an array at once if there is as much structure as Gibson assumes. Therefore the organism detecting stimulus structure must be *selecting* from what is available. What an organism selects must be dealt with in a theory of attention, and a theory of attention obviously is not subsumed by a theory of stimulus structure. Gibson dwells on attentional functions when he discusses his distinction between imposed and obtained stimulation (e.g., Gibson, 1966, pp. 31-46) and longer term perceptual learning, which he calls the "education of attention." Hence Gibson and Gyr must be in full agreement that stimulus structure alone cannot determine what is perceived. This removes the basic foundation of Gyr's criticism.

The second crucial misrepresentation of Gibson's theory stems from Gyr's failure to recognize that Gibson has a place in his theory for the role of voluntary action in perceiving, even though this role has nothing to do with distinguishing objective motion from subjective movement. The efferent copy theories to which Gyr subscribes focus on the problem of distinguishing objective motion from subjective movement. It has been assumed that what is directly available to a perceiver for the perception of motion is the motion of stimulus elements relative to the retina, an optical motion that is inherently ambiguous as to whether it is caused by motions of objects or movements of the perceiver. A plausible method for resolving this ambiguity is to argue that a perceiver has access to its plans for motor activity. These plans allow the organism to predict the stimulus changes that should result from the

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planned activities and thereby to factor out the stimulus changes caused by subjective movement from the total stimulus change. Gibson disputes this *particular* use of the central nervous system in perception because the ambiguity presumed in the beginning rarely exists. He argues that in all transforming arrays, structure specific to postures and movements of perceiving organisms (propriospecific information) and structure specific to objects and events outside the organism (exterospecific information) are available simultaneously. To the extent that there is stimulus structure specific to subjective movement distinct from stimulus structure specific to object motions, there is no need for any principle of disambiguation. As always in Gibson, the perceiver is free to selectively attend to one of these aspects more than another—if both are present to begin with. Whether such structure exists and can be discovered is a matter for theoretical and empirical research.

Investigating stimulus structure relevant to perception and the degree to which stimulus structure corresponds to its sources in world events is the basically geometric enterprise that Gibson calls ecological optics (when he confines himself to vision). Stimulus structure that does correspond to its environmental sources is what Gibson terms stimulus *information*. To the extent that information in this correspondence sense exists, the perceiver's problem is to detect it, not disambiguate it. For this reason, finding out how much stimulation has such properties is an important study that is logically prior to the study of perceiving or detecting the stimulus structure. Key investigations in this enterprise include Gibson, Olum, and Rosenblatt (1955); Purdy (1958); Hay (1966); Kaplan (1969); and Farber (1972). To quote Gyr, "Would it not . . . be limiting not to include this added source of information into one's theory of perception?" (p. 247). It is for these reasons that Gibson noted in his reply that a very substantial issue Gyr could have argued about is whether or not information (in Gibson's sense) exists.

Since Gibson denies that information (in the ordinary language sense, which Gyr seems to be using) about voluntary action is needed to distinguish subjective movement from ob-

jective motion, Gyr reasoned that Gibson can be read to claim that there is no basic difference between voluntary and nonvoluntary conditions of perceiving. To oppose this version of Gibson, Gyr cited several pages of evidence showing that perceiving really is different when organisms are voluntarily obtaining stimulus input than when organisms have much the same stimulus input imposed on them. Gibson emphatically embraces such data in his theory by distinguishing between obtained and imposed stimulation. Some of his own data would have been appropriate for Gyr to cite on this score (e.g., Gibson, 1962).

Gibson differs from Gyr in arguing that the difference between obtained perception and imposed perception lies in the success an organism will have in clarifying the available stimulus structure. This is certainly an effect of something like "intentionality" on perception, which is what Gyr's proposals amount to, but it has nothing to do with the addition of information or content to an ambient array by an organism. Indeed, one could go along with Gyr's language and add that Gibson is acknowledging a role for the central nervous system in perception even though it is not the particular role that Gyr envisions. But what would it mean to deny "that perception requires the intermediary of the central nervous system" (Gyr, 1972, p. 259)?

In summary, while we believe that there is much about Gibson's approach to perception that could be fruitfully criticized, we do not believe that Gyr has identified or discussed any of it. Gyr's criticisms are directed toward a theory which holds that stimulation can cause perception directly and that passive and active conditions of perceiving are essentially equivalent (since Gibson does not distinguish object motion and subjective movement on this basis). Gibson does not hold either of these positions.

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