Perception and action in sport: Half-time comments on the match

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While both the study of perception and the study of movement organization have long-standing traditions in the history of science (e.g. Descartes, 1664; Helmholz, 1867; Woodworth, 1899), the reciprocal relations between perception and movement have come to be addressed explicitly only much more recently. In fact, the success of the cognitive approach, inspired by the information-processing metaphor available since the late 1940s, did not stimulate the development of the empirical study of the interrelations between perception and movement. Within such an approach, on the one hand perception is conceived as the processes leading to a meaningful internal representation of the situation, on the basis of which appropriate decisions with respect to the actions to be undertaken can be made. Movement organization, on the other hand, is conceived as the processes by which the decisions taken are translated into meaningful action. Thus, the essence of both perception and movement organization is to be found in their representational nature, with the link between the two being assured by independent decisional processes. Movement is thus conceived as expressing the result of the perceptual, decisional and organizational processes that preceded it.

One of the practical consequences of this view has been that, for a considerable time, attention was focused almost exclusively on these perceptual, decisional and organizational processes to the detriment of an interest in movement itself. This orientation of attention is perhaps most clearly demonstrated by the reliance on the reaction time (RT) paradigm that dominated the research literature on movement behaviour in the 1970s and early 1980s. By the very choice of RT as the major dependent variable, the theories of motor control developed and tested within such a paradigm implicitly considered what happened before the movement occurred as being more interesting than the subsequent movement itself. Often the latter was not even analysed. The advent of sophisticated movement registration techniques certainly improved matters, as experimental analyses began to include aspects of the kinematic pattern of the movements produced. However, within the cognitive perspective, the search for invariant features of movement (e.g. Shapiro et al., 1981; Atkeson and Hollerbach, 1985) naturally remained inspired by the search for those aspects of movement that would be part of its representation.

Apart from a virulent debate (e.g. Fodor and Pylyshyn, 1981; Turvey et al., 1981), the position that neither perception nor movement should be characterized as essentially representational processes, that perception is directly implicated in the regulation of movement, and that movement is a constituent and indispensable element in the process of perception, as advocated by the ecological approach to perception and action (Gibson, 1979; Michaels and Carello, 1981), gave rise to a resurgence of interest in properties of movement \textit{per se}. While the goal of cognitive psychology is to understand the cognitive processes underlying perception, decision and the production of movement, the ecological approach to perception and action seeks to understand how meaningful interaction between actors or observers and their environment arise and how they can be sustained. The focus is on what kinds of information are relayed by patterns of stimulation and how these patterns of stimulation are linked to the movements produced, with respect to their origins as well as to their effects.

In terms of the organization of research into movement behaviour, the 1970s saw the birth of an institutionalized academic approach to human movement. All over the world, departments and faculties devoted to sport science, kinesiology, human movement studies and the like were created. In response to the important

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contribution of physical education teachers to the founding of this new discipline, the major goal initially identified was the application of the knowledge accumulated to the practice of physical education. After a quarter of a century with its conjunctural ups and downs and the ongoing discussions as to the status of the discipline, the result is that almost all actors now accord a high priority to a fundamental understanding of the processes of control, co-ordination and learning of perceptual-motor skills. However, a deep-running controversy remains as to the theoretical framework that should be embraced in doing this.

We believe this to be healthy. Whatever our personal inclinations in favour of one or another theoretical approach, we must applaud the fact that sport science has entered an era in which, rather than merely seeking to apply existing theories, the questions it poses have important implications for the advancement of theory proper. Useful application can only result from sound theory, because, to cite Kurt Lewin, 'nothing is more practical than a good theory' (Marrow, 1969). The controversy between the cognitive, ecological and other approaches is beneficial for sport science, simply because it forces proponents of both camps to deal with issues that they might otherwise prefer to avoid. Although practitioners will probably still not be satisfied with the distance remaining between the reduced objects of experimental science and the complexity of reality, the current focus on more realistic movement tasks, and the increasing academic pressure to deal with perception and action in a coherent manner, structure the research agenda of the discipline. As the debate pervades this issue of the Journal of Sports Sciences, we have chosen not to comment, either in general or on the individual contributions. The opinion of two randomly chosen players, who do not even fully agree, is surely not that interesting. Since a generally acceptable referee has not been designated, we simply propose to let history be the judge.

References


