Pickup of essential kinematics underpins expert perception of movement patterns

ABSTRACT

In a series of 3 experiments, the authors examined the ability of badminton players of different skill levels (12 experts and 12 nonexperts) to anticipate the direction of badminton strokes. Participants viewed either film or point-light displays under a range of temporal or spatial occlusion conditions. World-class players were able to consistently pick up useful predictive information from the advance (precontact) kinematics of both the lower body and the racquet when the motion of those features was presented in isolation, whereas recreational players' use of the same information depended on the concurrent presence of linked segments. Participants' information pickup closely matched key biomechanical changes in the movement pattern being viewed, although, contrary to a common-coding view of perception and action (e.g., W. Prinz, 1997), some important differences were evident between the characteristics of the experts' movement prediction and those of expert movement production.

Keyword: Expertise; Kinematics; Perception; Skill learning