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走高跳における“跳び越し”のアフォーダンス知覚と身体特性の関係

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The Relationship between the Affordance Perception for"Clearable" Height of Crossbar in High Jump and Properties of the Body

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Abstract

How do humans visually control their actions in complex environment? James J.Gibson (1979) proposed that they perceive what the environment offers or affords for actions. Theterm"affordance" means the functional utility of information about the environmental properties for the capability of perceive's action within the environment. Humans must perceive the affordances of the environment, that is, the match or mismatch between their own abilities and the qualities of the environment that support action within it (Thelen & Smith, 1994). This type of perception is called "affordance perception". The present study examined the relationship between the affordance perception of the environmental properties (i.e., the crossbar height) in performing (athletic) high-jump and the perceiver/actor's physical properties (e.g., body sizes and abilities for action). Fifty-four university male students were requested to judge whether they could "clear" or "not clear" the high-jump crossbar which was set by the experimenter at various levels in height. They were then required, after a brief rest, to actually perform high-jump trials with the crossbar height varied by the experimenter until they failed to clear it. The body sizes and the performance of both the vertical-jump and hand-ball-throw tests were also measured. The perceptual boundary between "clearable" and "not clearable" in judgement of the high-jump crossbar height (PH) was estimated by the method of constant stimuli. This (PH) appeared significantly correlated with both the subjects' body height and vertical-jump performance. The actual high-jump performance was also correlated with the body height and the body weight, and both the vertical-jump and hand-ball-throw performance. The ratio, PH/(LL+VJ) of the perceptua1 boundary in judgement of the high-jump crossbar height (PH) to the sum of the leg length (LL) and vertical-jump performance (VJ) was calculated for each subject. The mean ratio calculated on the basis of the data from all subjects was approximately 0.96. The mean ratio was also calculated for each subjects group of relatively small and tall in body height. The ratio appeared invariant between the two groups, irrespective of different leg lengths and vertical-jump performance for the two groups. These results show that the affordance perception for the high-jump action may well be mediated by both the environment and perceiver/actor's physical properties, such as body sizes and abilities supporting the high-jump action.

Key words： affordance, action, properties of body, high jump