Perception of walker: Human, robot, and point-lights

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Abstract

Human perceives others' walking directions in everyday life. It is important to avoid from or approach to them, and our walking behavior is an explicit and implicit negotiation between others' and our walking directions. In this study, we investigated the accuracy of perceiving direction of human, robot, and point-light walkers, and its inversion effect. We made a three-dimensional model of a human walking at a place. Human-walker stimulus was generated by rendering the model with smooth shading. Robot-walker stimulus by replacing body parts such as arms, legs, head, and hands with geometrical objects. Point-light-walker stimulus was made by capturing 18 positions of the body like a biological motion. For each trial, one of walkers was presented for 117, 250, 500 or 1000 ms on a CRT display while its direction was randomly varied, and we measured accuracy of perceived walking directions. The accuracy increased with long duration, and was better for human walkers than robots and point-light walkers. However, inverted presentation (upside-down) of stimuli made the accuracy difference small. It is suggested that the perception of walkers' direction depends on their appearances, and related to our social perception.