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Prior probability information impairs goalkeeper judgments of penalty kick direction

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When attempting to save a football penalty kick, the advantage to the goalkeeper of prior probability information is predicated on the benefits of congruent outcomes outweighing the costs of incongruent outcomes. In part, this rests on the assumption that the biasing effect of probability information will be equivalent across genuine and deceptive actions. Yet, exaggerated static and dynamic stimuli have been shown to elicit stronger responses and are commonly observed in deceptive actions. In the present study we tested the hypothesis that situational probability information will more strongly bias responses to deceptive actions than genuine actions, resulting in impaired discriminability of kick direction. Twelve semi-professional goalkeepers responded to 120 video clips of two skilled, right-footed penalty-takers directing genuine and deceptive kicks to the left or right side of the goal. Before each kick, goalkeepers were given the probability of the kick being directed to each side, so that each kick outcome was associated with 0.20, 0.35, 0.50, 0.65, or 0.80. Each video clip was occluded at the frame before the kicker's foot made contact with the ball. We recorded goalkeeper response times, response accuracy, and visual behaviour. Signal detection analysis revealed that probability information strongly biased goalkeeper responses, $F(4,44)=14.38$, $p<.001$, $\eta_p^2=.57$. Response bias for high probability values was stronger for deceptive than genuine actions, resulting in impaired discriminability of kick direction relative to the 50-50 condition, $F(2,22)=6.71$, $p=.005$, $\eta_p^2=.57$. We conclude that deceptive actions take on 'super-deceptive' properties when probability information is aligned with misleading kinematic information.