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Winning visual strategies of professional baseball players Seeing the essence of baseball batting

Abstract

We conducted the first large-scale study on gaze behavior in 39 professional baseball batters to investigate how visual strategies differ across individuals and relate to batting performance. We assessed each player's ability to acquire critical visual information for predicting ball trajectory by measuring eye and head movements during actual hitting situations. Our findings revealed distinctive characteristics of skilled batters-beyond what conventional physical metrics can capture-and highlighted diverse, individually optimized gaze strategies. These results underscore the refined and varied visuomotor processing mechanisms among top athletes. By clarifying elite athletes' highly optimized visual processing diversity, we aim to develop practical training and coaching methods tailored to each individual. These insights have broader applications in enhancing athletic performance, rehabilitation, and motor skill acquisition, ultimately contributing to improved quality of life (QOL) for individuals with diverse physical and cognitive abilities.



References

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