"Keep Your Eye on the Ball": A Comparative Study of the Visual Tracking Accuracy of Baseball Batters and Non-Athletes During Knuckleball Tracking

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Visual tracking is an important skill to have to be successful in any sport. However, in baseball, the eyes play a vital role in the success of players. A fastball thrown by a pitcher will reach home plate in about 450 ms, leaving the batter with 250 ms to first see the pitch (identify location, spin, and speed) and then determine if, when, and where to swing. To date, researchers have looked extensively at how batters' eyes behave while tracking both fastballs and curveballs, the two most common pitches in baseball; however there exists a lack of literature pertaining to how the eyes of experienced batters track a knuckleball, a rare yet highly effective pitch. Therefore, in this study, the accuracy of both experienced batters and non-baseball players was observed while visually tracking three types of pitches: fastballs, curveballs, and knuckleballs. A high-tech eye-tracking device recorded the focal point of all participants. Results showed while there were no significant differences observed between experienced batters and non-athletes when predicting if a pitch was a ball or a strike, experienced batters maintained significantly more accurate eye tracking than inexperienced batters during all pitch types. This result suggests that eye tracking superiority seen in baseball batters does not stem solely from experience with a particular pitch, rather, it emerges from a multitude of factors including reaction time and visual acuity. Therefore, players and coaches should put more focus on training these factors as opposed to only increasing exposure to various pitches.

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