

DOES COURSE OF A PRECEDING PITCH INFLUENCE BASEBALL BATTING AS THEY SAY?

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INTRODUCTION

It is generally believed that a certain combination of pitches influences the performance of baseball batting. However, it is difficult to elucidate it in real game situation, because several factors involve it (not only characteristics of pitches but also game situations). Gray (2002) ascertained, in his virtual batting study, that there were both the expectancy effect concerning the preceding pitch sequence and the pitch count effect [1]. He focused on change of pitch speed. In the current study, we focused on change of the course of pitch, especially whether the course of the preceding pitch individually influence the movement of batting the succeeding low-and-outside ball.

METHODS

Eight experienced college-level baseball players voluntarily participated in this study. Their mean height was 1.75 m (SD = 0.06), mean body mass was 71.9 kg (SD = 25.4), mean age was 20.6 years (SD = 1.2), and mean number of years of playing experience was 12.3 years (SD = 2.5). After detailed explanation of the experiment and filling out an informed consent, they were provided sufficient amount of time for warm-up including bat swings.

Three reflective markers with 19 mm in diameter were put at the distal end of an aluminum bat. Its length was 0.85 m and its mass was 0.87 kg. Reflective markers were also put on the top of participant's head, both of lateral tip of the acromions, and both of anterior superior iliac spines. A four-camera ProReflex system (Qualisys) was used to collect the three-dimensional coordinates of the reflective markers with sampling frequency at 200 Hz during swings.



The task was to 'hit' a virtual ball, simulating an approaching baseball. The virtual pitch was displayed on a large display (2.1 m in vertical X 6 m in horizontal) with a pitcher (height was 1.78 m) in a baseball stadium. The

trajectories of pitches were computed based on the pitch velocity, the angle of incidence, air resistance, and spin of the ball (Himeno, 2001). The ball velocity at the instant of ball release was always set at 33.3 m/s. Each participant first swung in the control condition in which he was informed where the ball was thrown, then swung in the pseudo-random condition in which the course of pitch was strategically decided so as not to be noticed by the participants.

A block consisted of approximately 22 swings with a 20 sec. rest between swings, and eight blocks were performed with 2–10 min. rest between blocks.

Several kinematic variables concerning trunk and bat movements during swing for the pitch into low-and-outside corner of the strike zone were calculated and compared among the conditions of the course of the preceding pitch.

RESULTS AND DISCUSSION

Although angle of trunk forward bending did not differ among conditions, both of maximum angles of the pelvis rotation and the upper trunk during backswing were significantly smaller in the condition where the preceding pitch was the low-and-outside pitch (pre-LO condition), than in the condition where the preceding pitch was high-and-inside (pre-IH condition) (Figure 1).

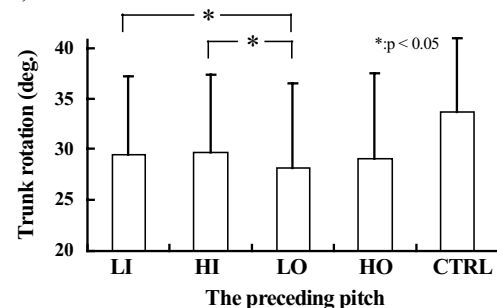


Figure 1: Maximum upper trunk rotation during backswing for the low-and-outside strike. LI, HI, LO, HO, CTRL stand for low-and-inside, high-and-inside, low-and-outside, high-and-outside, and pre-informed conditions, respectively.

Maximum angular velocity of the upper trunk during forward swing had a tendency to be slightly lower in the pre-OL condition than in the pre-IH condition.

From the above results, it is suggested that the participants expected that the probability of successive low-and-outside pitches was low and the probability of the low-and-outside pitch after high-and-inside pitch was high.

CONCLUSIONS

From the results of the swings for the same course of the pitch but different course of the preceding pitch, it was found that even only the course of the preceding pitch influenced the trunk movement during batting for the low-and-outside ball.

REFERENCES

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