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THE INFLUENCE OF EXPERTISE AND OVERHEAD SHOTS ON ANTICIPATION OF DECEPTIVE BADMINTON SHOTS

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ABSTRACT

The current study examined the effect of expertise and overhead shots on the anticipation of deceptive badminton shots. The methods were inspired by Abernethy, Jackson, and Wang (2010) and Park et al. (2019). Participants (badminton experts, near-experts, and non-badminton players) viewed novel badminton videos and marked on an outline of a badminton court where they predicted badminton shots to land. The findings showed that the deceptive badminton drop shot might be the most difficult to anticipate, with level of expertise resulting in greater anticipation skills. The study therefore concluded that deception may influence an opponent's skill to anticipate shots, and deception might be a valuable strategy in badminton.

Keywords: Badminton, Overhead shots, Deception, Anticipation, Expertise

INTRODUCTION

Exceptional vision is not a requirement for expertise in sports (Memmert, Simons, & Grimme, 2009). Therefore, perceptual-cognitive skills, such as anticipation, may shape expertise in badminton. Anticipation is the skill to predict future events before they take place, and enhanced anticipation skills are highly necessary in badminton as players need to respond to speeds of over 400km/h (Piras, Lobietti & Squatrito, 2014; Asferg, 2019; Williams & Jackson, 2019).

Badminton players may use deception to hinder the process of anticipation and trick their opponent to think that something other than the true event is going to occur (Runeson & Frykholm, 1983; Abernethy, Jackson, & Wang, 2010, 2010b; Abernethy & Zawi, 2007; Mann, Williams, Ward, & Janelle, 2007; El-Gizawy & Akl, 2014; Park, Ryu, Uiga, Masters, Abernethy, & Mann, 2019; The art of deception, n.d.). Players commonly develop personal trick shots to deceive their opponent, such as the double action shot by Peter Gade. Although common, to the knowledge of the current study, research on the influence of deception on badminton anticipation is limited.

Abernethy, Jackson, & Wang, (2010) asked different levels of badminton players to view videos of both deceptive and non-deceptive badminton shots, and

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anticipate if the shot was aimed to the forehand or backhand side of the court. The video clips were paused at either 160 or 80 milliseconds before the racket intercepted the flight direction of the shuttlecock (also known as the point of interception (Müller & Abernethy, 2012), or 80 milliseconds after the point of interception had been reached. Deception was found to influence anticipation, regardless of expertise level and irrespective of when the videos were stopped. Hence, deception may effectively deceive any level of opponent at any time from when the shuttlecock is released until it makes contact with the racket. Therefore, deception may be a valuable strategy in badminton.

The study by Park, Ryu, Uiga, and Masters (2019) also included video methods to examine deception. Badminton players viewed videos of players returning serves with overhead shots during deceptive or non-deceptive conditions. During deceptive conditions, eye gaze and head direction were emphasized to deceive the participants of the shuttlecock's flight direction. In comparison to the findings by Abernethy et al, (2010) the results showed that experts outperformed novices, regardless of whether deception took place. Therefore, from these studies, the current investigation expected that deception is prevalent in badminton (Abernethy, Jackson, and Wan, 2010; Park et al., 2019) and experts may outperform novices (Park et al., 2019).

METHODS

The current study included video methods to examine the effects of expertise and overhead badminton shots on the skill to anticipate deceptive badminton shots. The video clips included recordings of high-level badminton players completing badminton overhead shots. Overhead shots are a distinctive trait to badminton. The current study therefore, like the study by Park et al, (2019) included these in the methods. Overhead shots in the methods included clear shots (long and high shot to the back of the opponents' court side), drop shots (soft and steep, slow shot downwards to the front of the opponents' court side), and smash shots (hard and steep, fast shot downwards to the middle of the opponents' court side). These shots were either completed deceptively or non-deceptively. Deception was defined as badminton forehand overhead shots that were played with intentions hidden from the opponent. Shots played diagonally across the court, cross-court shots, are considered more difficult to anticipate, since the trajectory of the shuttle is determined at the very last minute and allow for minimal cues to be displayed to the opponent. Therefore, the current study considered cross-court badminton shots as deceptive badminton shots.

The recordings were edited in Windows Movie Maker, version 2.6, and later uploaded to YouTube for easy access to the participants (Kamruddin, 2020). The final version included a total of 60 clips. These were presented at random order and included an equal number of clips of clear shots, drop shots, and smash shots. Each clip had duration of one-second and included the view of a badminton player moving from the center of the court to hit the shuttle. The clip froze at the point of interception and a black screen appeared for five seconds following each clip. The duration of the black screen was determined from a trial round, and the color of the screen was deemed to not have influenced eye movements, since participants were

not looking at the screen during this time. During this time, they were marking where they thought the shuttlecock from the videos would land on paper with an outline of a badminton court.

For the analysis, badminton shots, arguably, are aimed towards a specific part of the badminton court **(Figure 1).** Clear shots were considered to reach area 5 and 6, smash shots area 3 and 4, and drop shots area 1 and 2. Deception was assumed to have successfully influenced anticipation, should participants incorrectly mark the landing of the shuttlecock, regardless of type of overhead shot or expertise level.

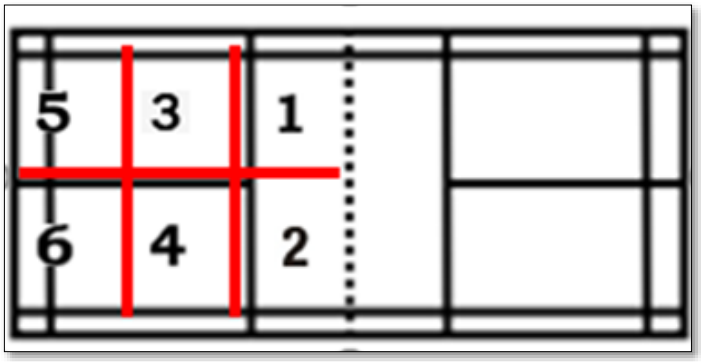

Figure 1. Image of a badminton court with markings to show where clear shots, smashes, and drop shots are expected to land on a badminton court.

RESULTS

For the analysis, expertise (experts, near-experts, novices) and type of shot (clears, drops, and smashes) acted as the independent variable, and anticipation of deceptive shots acted as the dependent variable.

The Shapiro-Wilk test showed that the scores on the MRT followed normal distribution, $p>0.01$, supported by measurements of skewness, 0.59, and kurtosis, -0.56. Further, the Levene's test of variance was not found to be significant, $p>0.05$, and parametric testing therefore took place.

The two-way ANOVA presented significant effects of the drops on expertise ($F(2, 48)= 8.24$, $p<0.01$, $\eta p^2 =0.49$) on anticipation. The Tukey's HSD test for multiple comparisons, for the drops, found anticipation to be significantly different between the experts and the beginners ($p= 0.01$, 95% C.I.= [-0.16, -0.03]), and the near-experts and the beginners ($p= 0.01$, 95% C.I.= [0.03, 0.18]).

DISCUSSION AND CONCLUSION

The current study asked different level badminton players to anticipate the final locations of the shuttlecock from overhead shots under deceptive conditions. The results, for the first time, showed that, during deceptive conditions, the drops shots were the most difficult shots to anticipate, with higher level of expertise resulting in greater level of anticipation scores.

Badminton overhead shots include similar techniques until the point of interception. For effective clear shots, players will hit the shuttle at its peak height with their extended arm to push the shuttle across the net. In comparison, for drop

and smash shots, the player will hit the shuttle slightly later after its peak height, at the point it starts coming back down towards the court, to push it faster down towards the ground. In comparison to a smash and clear shot, the drop only requires a light tap of the racket and players therefore need not use their full body to generate power. Hence, players will display less cues to their opponent, making the drop shot more difficult to anticipate. The current experts appeared to have utilized this knowledge to their advantage and therefore predicted more drop shots than the near-experts and the non-badminton players.

Future directions include the effect of different types of drop shots, such as slice shots or jump shots, on a player's anticipation skills and to establish when near-experts become experts.

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