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The effectiveness of keeper-independent penalty kicks using fake visual cues from penalty takers

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Previous research has shown that skilled football goalkeepers effectively utilised individualised visual search patterns to gather anticipatory cues from a penalty taker. Deceptive cues employed by a penalty taker induced lower save rates. However, it is unclear if goalkeeper visual search (percentage viewing time of areas of interest) differed between deceptive and non-deceptive conditions. This study investigated the effectiveness of using fake visual cues by the penalty taker, and corresponding visual search behaviours. Nine skilled goalkeepers simulated saves of 15 deceptive and 15 non-deceptive 2000ms clips by moving their hands left or right. Deception involved kicker's gaze direction and approach angle. Deceptive trials had a lower percentage save rate. When two deceptive cues were combined, performance was further impaired. Available data for four participants showed individualised visual search patterns. In conclusion, using deceptive cues by a penalty taker is effective and individualised visual search behaviour was present.

KEY WORDS: Deceptive *cues*, Football, Penalty kick

According to the rules of the Federation Internationale de Football Association (FIFA), the penalty shootout is used to decide the match outcome in the knock-out phases and finals of association football if both teams are tied at the end of periods of extra time (FIFA, 2011). It has been highlighted that about one-quarter of major competitions in international football featured a penalty shootout, including the 2006 World Cup Final in Germany (Jordet, Hartman, Visscher & Lemmink, 2007; Jordet & Elferink-Gemser, 2012). Further, the importance of the penalty kick is underlined by the extensive literature available on its different aspects, such as on ideal kick

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placement (Bar-Eli & Azar, 2009; Van der Kamp, 2006) and action bias of goalkeepers (Bar-Eli & Azar, 2009; Bar-Eli, Azar, Ritov, Keidarlevin, & Schein, 2007).

As suggested by Van der Kamp (2006), generally a penalty taker may adopt one of two strategies. The first is the keeper dependent strategy, where the penalty taker's action is decided only at the final moment, based on anticipatory cues picked up from the goalkeeper. The second is the keeper independent strategy, where the penalty taker's kick is predetermined, that is, irrespective of the goalkeeper's movements. The goalkeeper dependent strategy is considered less viable as the late alteration of the kick translates to slower ball velocity and poorer accuracy (Van der Kamp, 2006; van der Kamp, 2011). Conversely, the more accurate shot placement (towards the goal edges) in the keeper independent strategy meant that even if the keeper dived in the direction of the shot, it is still harder to make a successful save (Botwell, King, & Pain, 2009). Separately, recent work by Wood and Wilson (2010) proposed a third strategy termed opposite-independent, where the actual shot placement by the penalty taker is opposite from the direction of his last fixation. In considering whether the penalty taker's actions were influenced by the goalkeeper however, the opposite-independent strategy should rightly be regarded as a subset of the keeper independent strategy.

From the goalkeeper's perspective, the most effective anticipatory cue is the placement of the penalty taker's non-kicking foot (Franks & Harvey, 1997; Lees & Owens, 2011) which occurs 200 to 250ms before ball contact (Franks & Harvey, 1997). Lees and Owens (2011) further suggested that cues following the placement of the non-kicking foot, such as the knee flexion angle of the kicking leg, would not allow the goalkeeper sufficient time to initiate a correct response. Other possible cues for the pickup of anticipation information include the angle of approach (run-up) and trunk orientation (Franks & Harvey, 1997; Lees & Owens, 2011). Similar findings on the kicking leg and ball being the most predictive cues yet occurring too late to initiate a timely response were reported in Dicks, Davids and Button (2010b) (see Dicks et al. (2010b) for a summary table of the presentation points of different cues). In a recent paper by Diaz, Fajen and Phillips (2012), it was further suggested that the use of visual information distributed across the body segments of the penalty taker was more relevant for anticipation than specific cues that are localised to one segment of the moving limb. This suggest that goalkeepers could possibly still focus on a few body segments to provide useful information for anticipation and examination of visual search strategies of goalkeepers could then be focused on several key area of interests rather than just one specific cue.

Using video simulation methods, Savelsbergh, Van der Kamp, Williams and Ward (2005) found that while successful expert goalkeepers displayed greater fixation time on the non-kicking leg as compared to their unsuccessful expert counterparts, this was not true for comparisons between novice and expert goalkeepers. Apart from the non-kicking leg, the experts also fixated on the kicking leg and area around the ball, whereas the novices fixated on the trunk, arms and hips of the penalty taker. Moreover, the experts employed a more efficient visual search strategy of having fewer fixations but of longer durations. It was also observed that there were no differences in visual search behaviour between successful and unsuccessful anticipation of penalties within both the novice and expert goalkeepers (Savelsbergh, Williams, Van der Kamp, & Ward, 2002).

Recently, Dicks, Button and Davids (2010) and Dicks et al. (2010b) examined individual differences and action-scaling in goalkeepers through the use of deceptive cues by a penalty taker. The case for individual differences in visual perception was highlighted in a review by Withagen and Chemero (2009). It was suggested that individuals within a same population may be expected to use informational variables differently, as a result of their differing perceptual capabilities. The study of deception in sport contexts is not new, but to our knowledge, these were the first in football penalty kicking; previous studies, utilising video simulation protocols, include those in basketball (Sebanz & Shiffrar, 2009), handball (Cañal-Bruland & Schmidt, 2009; Cañal-Bruland, Van der Kamp, & van Kesteren, 2010) and rugby (Brault, Bideau, Craig, & Kulpa, 2010; Jackson, Warren, & Abernethy, 2006).

Deception is the ability to disguise actions that may be used to predict future events thereby tricking the observer's subjective perceptions (Kuhn & Land, 2006). When faced with the use of deceptive cues by the penalty taker, goalkeeping performance was better in non-deceptive trials as compared to deceptive trials. In addition, goalkeepers who initiated their movements earlier (those with slower reaction times) were more susceptible to deception, suggesting that the early-onset deceptive cues by the penalty taker had a negative effect on goalkeeping performance (Dicks et al., 2010; Dicks et al., 2010b). However, the effectiveness of the deceptive cues has not yet been established systematically. Previously, a review by Williams, Ford, Eccles and Ward (2011) showed consistent evidence that skilled sport performers utilise advanced visual cues from several areas simultaneously, arguably reducing the skilled performer's susceptibility to deception. Hence it may be inferred that the greater number of deceptive cues present, the more likely the deception would be successful. Dicks, Uehara, & Lima (2011) further highlighted that there are individual differences in the way goal-keepers respond to a

penalty kick due to their own action capabilities. It is then highly possible that these goal-keepers would adopt an individualised response to penalty kick situations and the emergence of a common effective visual search strategy for successful goal-keepers (as an example) who are less likely to be deceived may not surface as the actual responses would be tied to action capabilities of the individual goal-keeper. Interestingly; it could also mean that regardless of the presence or absence of deceptive kicks, it is likely that individual goal-keepers may still consistently use the same visual search patterns to try to stop the kick and this requires empirical examination.

The aim of the study was to investigate the effectiveness of using deception whilst taking penalty kicks through a video simulation task, and to identify if corresponding goalkeeper visual gaze patterns differs. It was hypothesized that goalkeeping performance measured by save rates would be lower in deceptive conditions, and that there would be no differences in visual search patterns, as determined by percentage viewing time, between deceptive and non-deceptive trials. Additionally the number of deceptive cues was manipulated in order to test the idea that a larger number of deceptive cues results in more effective deception.

Methods

Participants

Nine male skilled football goalkeepers (Mean age = 24.8 ± 6.2 years, Mean height = 1.76 ± 0.05m and Mean weight = 82.3 ± 10.7kg) were recruited as participants. Average playing experience was 13.0 ± 5.5 years at tertiary and club level in Singapore. One skilled regular penalty taker, 37 years old and right footed, executed all kicks used for the study. Written informed consent was obtained from all participants, and the procedures used in the study were in accordance with the participating institution's ethical guidelines.

Apparatus

The mode of information presentation was video recordings, hence 30 penalty kicks were pre-recorded with a 25Hz video recorder (Sony HVR-Z7) placed in the centre of a full-size goal (7.32 x 2.44 m) and executed by the penalty taker in accordance with FIFA regulations. Despite the shortcomings of the video stimulus protocol (see Button, Dicks, Haines, Barker, & Davids, 2010; Dicks et al., 2010a), the need for having a well-controlled experiment was prioritised. One advantage of this method though, was that during the video editing process, each trial could first be reviewed to ensure the intended experimental conditions were correct and prominent, unlike the post-experiment verification used by Piras and Vickers (2011) which could have introduced some errors due to variations in the kick placement

by the penalty taker. Subsequently, the trials were edited to 2000ms clips (dimensions 1280x720 pixels) which was similar to the protocol by Poulter, Jackson, Wann and Berry (2005), and terminated one frame (40ms) prior to the point of ball contact. Finally, a total of 30 clips comprising 15 deceptive and 15 non-deceptive trials were selected and randomised into 3 blocks of 10 trials for the video stimulus. The number of trials per participant and total number of trials were similar to those of previous studies (e.g., Savelsbergh et al., 2002; Savelsbergh et al., 2005; Woods & Wilson, 2010). As the purpose of the study was to investigate the effectiveness of deceptive cues, the kicks were directed only to the bottom left or right of the goal based on previous literature linking certain cues displayed by the penalty taker to corresponding shot locations (see Video Stimulus Production). All kicks were recorded within a 1.5 hour session to ensure uniformity in weather conditions.

The experiment was conducted in a laboratory setting within an air-conditioned room with audio only from the background sounds of the video stimulus and room lights switched off. The clips were projected onto a wall (1.37m x 0.78m) positioned 2.40m away from participants. This produced a subtended visual angle of approximately 8° of the image of the penalty taker at the point before ball contact, similar to the layouts reported by Savelsbergh et al. (2002) and Savelsbergh et al. (2005) which closely simulated what a goalkeeper would encounter in an actual penalty situation. The response movements by the participants were recorded by the experimenter, and also captured on a video recorder (JVC Everio NV-GS300) at 30Hz for confirmatory purposes.

Visual search behaviour was recorded with a non-invasive, mobile eye tracking system iView X™ RED by SensoMotoric Instruments (SMI) GmbH. The RED is a fully automated image processor with inbuilt head movement compensation. Prior to the experiment, a nine-point calibration was performed, with system accuracy of 0.4° visual angle, within the 0.5° average of remote eye tracker devices (Bulling & Gellersen, 2010).

Video Stimulus Production

For non-deceptive trials, the penalty taker was required to shoot towards the desired location without deceptive intentions. For deceptive trials, the penalty taker displayed cues, based on Dicks et al. (2010b) and existing literature (e.g., Franks & Harvey, 1997; Nagano, Kato, & Fukuda, 2006; Williams & Burwitz, 1993; Williams & Griffiths, 2002), suggesting the kick would be directed towards a particular direction side but thereafter, kicked in the opposite direction. For example, during the run-up, the penalty taker would deliberately gaze at the intended direction of kick (non-deceptive) or away (deceptive). For a right-footed penalty taker directing kicks towards the dominant side (right) of the goal, the angle of approach would either be wide (35° ± 5°) (non-deceptive) or narrow (23° ± 5°) (deceptive). Conversely, for kicks directed towards the non-dominant side (left) of the goal, the angle of approach would either be narrow (23° ± 5°) (non-deceptive) or wide (35° ± 5°) (deceptive). In the case of a double deception, the penalty taker would gaze away from the intended direction of kick and adopt a narrow approach for kicks directed to the dominant side (right) or wide approach for the non-dominant side (left). Both wide and narrow approaches were standardised for a run-up distance of 4.0m used in previous studies (see Dicks et al.,2010; Dicks et al., 2010a; Williams & Griffiths, 2002), and were marked out with tape but not visible on video capture.

In total, the 30 clips comprised 15 non-deceptive trials, of which 8 were to the dominant (right) side and 7 to the non-dominant (left) side, and 15 deceptive trials. Within the decep-

tive trials, each of the three deceptive conditions (Eye, Angle & Double) was presented 5 times, of which 3 were to the dominant side (right) and 2 to the non-dominant side (left).

Procedure

Participants were attired in sportswear for the session. They were instructed to move their hands left or right to indicate an appropriate response, and were informed that the kicks were only to the left or right. They were also told that the clip would terminate before the point of ball contact. Before the actual experiment, 5 familiarisation trials were provided to allow the participants to be accustomed to the task requirements.

Statistic

Goalkeeping performance between deceptive and non-deceptive conditions, and within deceptive conditions were measured by mean save rate (%) and analysed using SPSS Statistics Version 17.0. Paired sample *t*-tests were used for the former, while one-way ANOVA was used for identifying differences between the three deceptive conditions. Although no actual save was made, the goalkeepers' responses were taken as a proxy for actual save rate. Effect sizes were measured with partial eta square ().

Visual gaze data was processed via Behavioral and Gaze Analysis (SMI BeGaze™ 2.2) software. Each clip was coded in a frame-by-frame procedure to identify nine Area of Interests (AOIs) listed by Dicks, Davids and Button (2010a), namely the penalty taker's head, upper body including arms, non-kicking leg and foot, kicking leg and foot, upper non-kicking leg and hip, upper kicking leg and hip, the ball, turf between kicker and the ball and the turf in front of the ball. To facilitate comparison of results between the present study and previous work, and to facilitate future work, the AOIs coded for were illustrated in Figure 1.

Percentage viewing time for each of the nine AOIs was obtained from BeGaze™. Paired sample *t*-tests were used to compare between percentage viewing time of each AOI between deceptive and non-deceptive conditions for each individual participant.

Results

Out of 270 trials, 13 (4.8%) were voided due to technical difficulties in the software processing of the video stimulus that resulted in no screen display, of which 6 and 7 were from the non-deceptive and deceptive conditions respectively.

Goalkeeping performances as measured by mean save rate (%) were 38.4 ± 10.7 and 65.4 ± 14.4 for deceptive and non-deceptive trials respectively (See Figure 2). The performances were not due to chance. The mean difference of 27.0% was significant at the .05 probability level, where $t(8) = 4.21$, $p = .003$.

Within deceptive trials, the mean save rates were 45.6 ± 32.8 %, 44.4 ± 21.9 % and 23.5 ± 20.3 % for Eye, Angle and Double deceptive conditions respectively (See Figure 3). ANOVA revealed no significant difference between the three conditions, where F (2, 24) = 2.12, p = .142 and partial = .150. Homogeneity of variance was assumed as Levene's statistic (2, 24) = 2.32, p = .120. However, large individual differences were noted (See Figure 4). For example, the save rates for Double deception was generally 0-40% except for Participant 4 with 67% and while Participants 2 and 7 had similar save rates of 20% for both Angle and Double deceptive conditions, those for Eye deception were vastly different at 100% and 20% respectively. Also, simply by removing the outlier Participant 4 (the one who showed better performance in the Double deceptive condition relative to the single deceptive conditions), the group results would be close to significance F (2, 22) = 3.442, p = .051.

Percentage viewing time of AOIs was successfully obtained for Participants 3, 6, 7 and 8. Data from Participants 1, 2, 4, 5 and 9 were sparse, with each containing less than 15 trials with recorded fixations. For these five participants, a majority of viewing time was spent as saccadic movement and/or blinking.

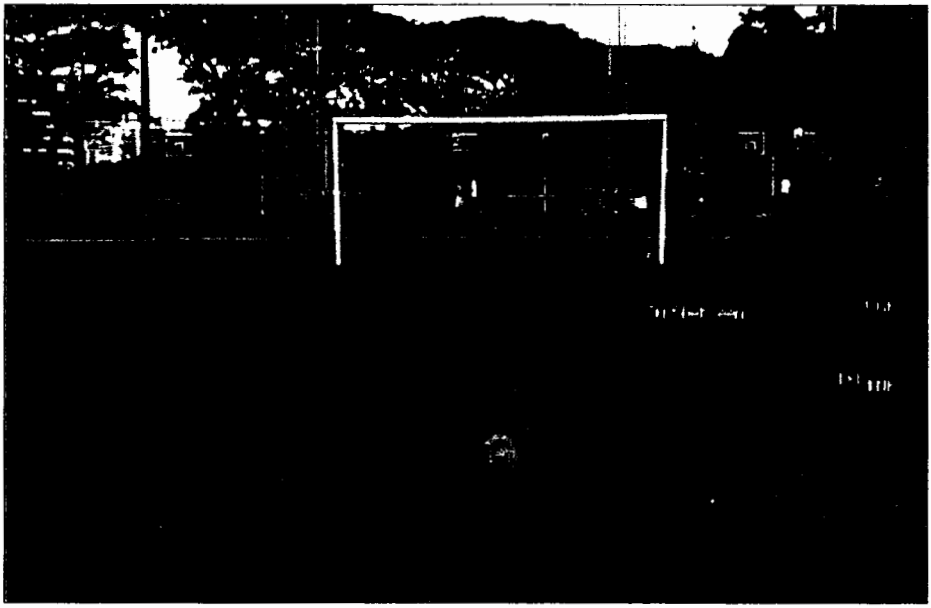

Fig. 1. Area of Interests (AOIs) identified in current study.

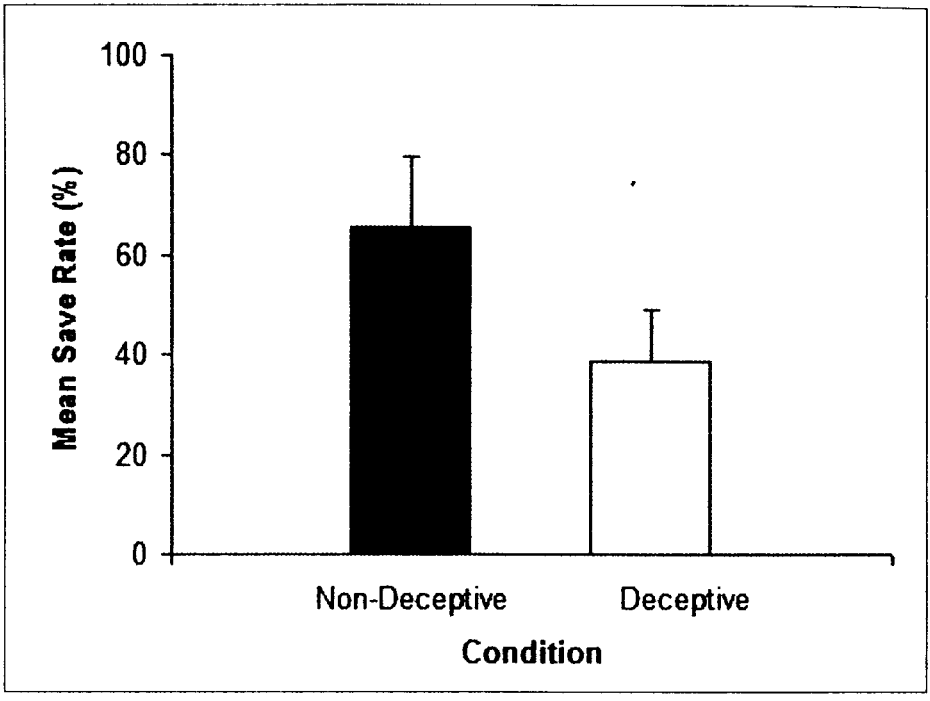

Fig. 2. Mean save rate for non-deceptive and deceptive conditions.

Paired sample *t*-tests revealed no significant differences for percentage viewing time of AOIs between deceptive and non-deceptive trials for Participants 3, 6, 7 and 8 individually. Based on the type of AOI and percentage viewing time of AOIs, the four participants did not use a uniform visual gaze pattern (See Figure 5). For example, while Participants 3 and 7 were among the most successful goalkeepers for non-deceptive trials at 79% save rate, clearly they used different AOIs where Participant 3 fixated on the ball and turf in front while Participant 7 fixated on the head, upper body and turf between. Also, the save rates in the eye deception condition for Participants 6, 7 and 8 were similar at 20%, yet only Participant 7 employed fixations to the head.

Discussion

The purpose of the study was to investigate the effectiveness of using fake visual cues by the penalty taker and to identify if corresponding goal-

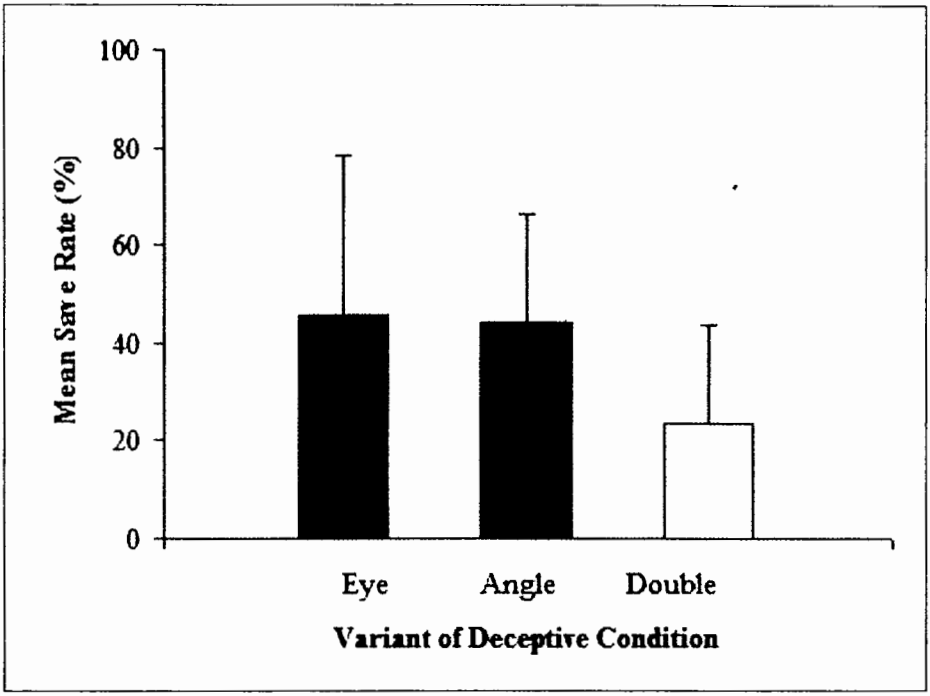

Fig. 3. Mean save rate for variant of deceptive conditions.

keeper visual gaze patterns differed. It was hypothesized that goalkeeping performance measured by save rates would be lower in deceptive conditions, and that there would be no differences in visual search patterns, as measured by percentage viewing time, between deceptive and non-deceptive trials.

In spite of the difference in experiment paradigms with the study by Dicks et al. (2010), the use of deceptive cues by the penalty taker has also been found to be effective in decreasing goalkeeping performance. Nevertheless, the present design provided a starting point to address the research question at hand and future work is envisioned to comprise replication by in-situ methods. The requirement for participants to move, rather than flick a switch or press a button, allowed some of the information-movement coupling to remain intact.

Data from four participants support the hypotheses that goalkeepers relied on individualised visual search patterns, and that these patterns were consistent between deceptive and non-deceptive trials. Thus, regardless of the condition imposed (deceptive or non-deceptive), goalkeepers would use

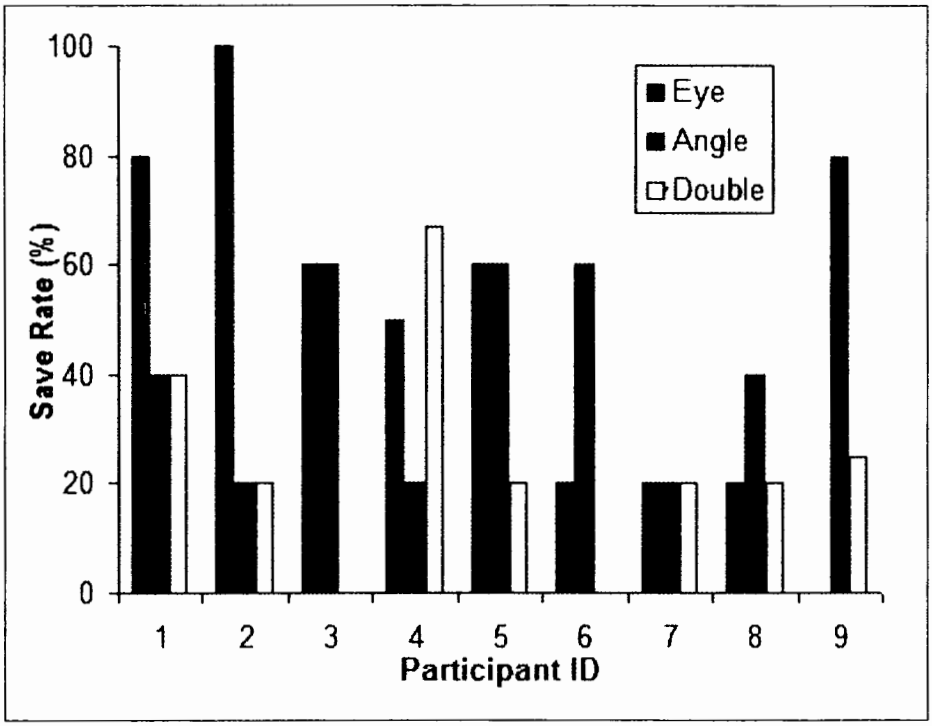

Fig. 4. Save rate for participants under various deceptive conditions.

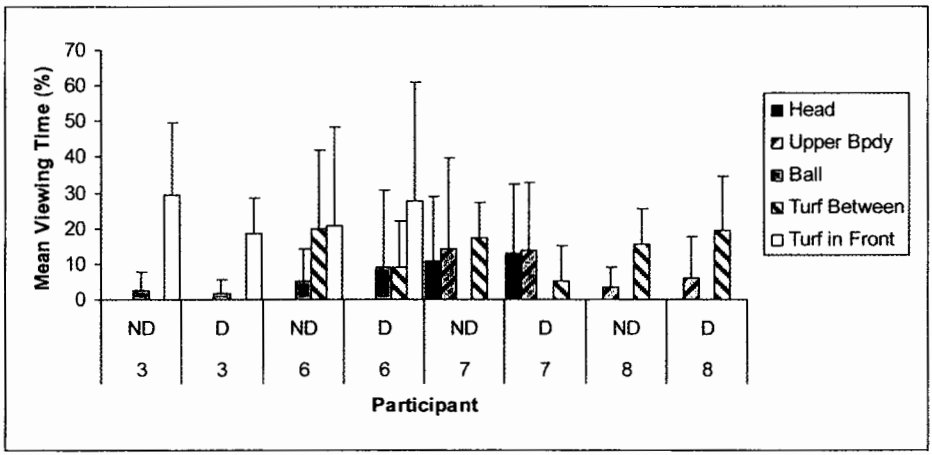

Fig. 5. Percentage viewing time of Area of Interests (AOIs) between Non-deceptive (ND) and Deceptive (D) conditions by individual participant.

a preferred visual search behaviour calibrated towards non-deceptive kicks. Although the information pickup by the goalkeeper remains the same in deceptive conditions, the dissociation between the cues displayed and the actual kick placement by the penalty taker causes the cues to be not useful for the goalkeeper. In other words, the preferred visual search behaviour is highly susceptible to the display of deceptive cues by the penalty taker.

Several evidences supporting that visual search is highly individualised were noted. For some participants, save rates for some variants of deceptive cues (i.e., eye deception) were higher than that of their non-deceptive trials. It may be inferred that the particular variant of deception being tested was not an important source of information for picking up anticipatory cues for those participants. These findings are consistent with the suggestion by Withagen and Chemero (2009) that one should expect variations within members of a population as to how informational variables are used. Moreover, there are possible variations in the pathways to achieve a successful outcome. As seen in Chow, Davids, Button and Koh (2006) investigation of a soccer chipping task, even skilled players demonstrated different kicking solutions to achieve the same successful outcome, highlighting the important phenomenon of degeneracy where the movement system can utilise different movement solutions to attain the same performance goal (see Edelman & Gally, 2001). Thus, variable coordination strategies can be used to achieve a task goal. With reference to the current study, the usefulness of kinematic information at any one location may be variable across trials during the anticipation of another person's movement. Together, it is implied that deceptive cues are not equally effective against all goalkeepers even within similar skill levels. Since expert and novice goalkeepers were found to focus on different AOIs (Savelsbergh et al., 2005), it is recommended that the most effective cue(s) be determined for a specific level of competition before specific training guidelines for training penalty takers are established.

On the other hand, from the goalkeeper's point of view, the present results do not yet constitute a case for making specific recommendations as to what AOIs goalkeepers should fixate on to avoid deception. The use of deception to the penalty taker's favour plays on the fact that the preferred visual search behaviour of the goalkeeper has been configured to non-deceptive kicks. Should this preferred behaviour be re-trained otherwise to anticipate deceptive kicks, the effects of goalkeeping performance in non-deceptive kicks may be affected, possibly negatively. Further, it seems that fixation parameters alone might not adequately quantify visual search behaviour, since goalkeepers can use different fixations of AOIs yet produce similar

goalkeeping performance. Participant 3 fixated on the ball and turf in front while Participant 7 fixated on the head, upper body and turf between. Clearly these are different AOIs, yet both were among the most successful goalkeepers for non-deceptive trials at 79% save rate. Also, while one would expect Participant 7 to be deceived especially in the eye deception condition since he fixated on the head, similar poor save rates of 20% were reported for Participants 6 and 8. Especially for Participant 6, this is even more striking given that the fixations reported were not even based on the penalty taker (i.e. turf between, turf in front and ball). Interestingly, none of the four participants, including the two of the best performers in the non-deceptive conditions, had any fixations on the lower body AOIs (non-kicking leg and foot, kicking leg and foot, upper non-kicking leg and hip, upper kicking leg and hip). This is surprising given that the literature (e.g. Savelsbergh et al., 2005; Lees & Owens, 2011) have identified the non-kicking leg as an important source of information. While the reason for the participants not fixating on the lower body AOIs remains speculative, again this suggests that some form of distributed information pickup is occurring. With future developments in understanding visual search behaviour, subsequent studies may consider the use of PCA or cluster analysis.

Based on the systematic separation and combination of the Eye and Angle deceptive cues in this study, there is indicative evidence to suggest that the use of the double deception (e.g., Eye and Angle combined) may be more effective than a single deceptive cue (e.g., Eye or Angle) alone. Within the three deceptive conditions tested, only Participant 4 had a save rate for Double deception better than that of either of the single deceptive cue conditions. The other 8 participants had save rates for Double deception that were the poorest or equally poor within the three deceptive conditions. As mentioned earlier, excluding the data from Participant 4 would have resulted in a difference in save rates close to significance between the Double deception versus the single deception conditions. Thus, the findings provide support for the observation by Jackson et al. (2006) that skilled performers tend to rely on several areas to receive anticipatory cues. Perhaps in future studies, a greater number of deceptive cues may be used to sufficiently confound these skilled performers. Such an observation on distributed visual information is congruent with the findings from Diaz et al. (2012) and highlights the importance of providing as many deceptive cues across the different segments of the body for the penalty taker to more effectively deceive the goalkeeper. As the present study was limited by a small sample size and considerable individual variations, more numerical data is required to support this other preliminary finding. A suggestion is to adopt the methodological testing of the

numerous possible variants and combinations of deception in order to determine the most effective cue(s) that a penalty taker may display.

It is also of interest for future investigations to examine other variants of deceptive cues, particularly the placement of the non-kicking foot. Nonetheless, one consideration would be whether it is realistically possible to employ these later stage deceptive cues to produce sufficient ball speed and control, noting the altered kicking biomechanics prior to planting of the foot would affect shot accuracy (Van der Kamp, 2006). While Lees and Owens (2011) suggested that cues following the placement of the non-kicking foot, such as the knee flexion angle of the kicking leg, would not allow the goalkeeper sufficient time to initiate a correct response, Van der Kamp (2006) concluded that the closer to the point of ball contact the penalty taker tries to alter the direction of the kick (and thus changing the available anticipatory visual cues to the goalkeeper), the lower the chances of a successful penalty kick. Thus the challenge faced by the penalty taker is to alter the latest possible cue while still being able to reproduce a similar outcome. This critical time by which any kick alterations should happen remains unclear; modifying the kicking action 200 to 250ms is beyond the 500ms time period suggested by the computer simulation study of Morya, Ranvaud and Pinheiro (2001) and almost double the duration proposed by Van der Kamp (2006).

This study was possibly limited by the use of video display and simulated movement, which was previously found to produce gaze patterns that differed from in-situ situations (Button et al., 2010; Dicks et al., 2010a). Nonetheless, the choice of the video stimulus protocol highlights the trade-off between the needs of conducting a controlled experiment and ecological validity, previously recognised by Williams and Ericsson (2005) as an issue of motor behaviour studies. In addition, despite the emphasis on focal vision usually measured by fixations, it is also argued that gaze does not equate information pickup (Hagemann, Schorer, Cañal-Bruland, Lotz, & Strauss, 2010; Williams & Davids, 1998).

Considerable individual differences were noted in this study between the gaze behaviours of participants and this has also been identified in the literature (see Croft, Button, & Dicks, 2010). Nonetheless, despite the individual differences in the specific anticipatory visual cues used, goalkeeping performance was generally adversely affected by the use of deceptive cues by the penalty taker. Hence, from a broader perspective, the findings of the effectiveness of deception corroborates with previous research across various sports (Brault et al., 2010; Cañal-Bruland, & Schmidt, 2009; Cañal-Bruland et al., 2010; Jackson et al., 2006; Sebanz & Shiffrar, 2009), suggesting that one practical application of the findings of this study would be to incorporate

practising deceptive actions in the training of football penalty takers. It has also been suggested that increasing the variance across trials may help learners detect invariance (deceptive or non-deceptive) in responding to penalty kick situations (see Huet, Jacobs, Camachon, Missenard, Gray, & Montagne, 2011; Dicks et al., 2011) although empirical investigations would be required to ascertain such a recommendation especially when individual differences in kicking kinematics may be inherently present among performers.

In conclusion, goalkeepers tend to rely on fixed, individualised visual search patterns which are susceptible to the presentation of deceptive cues by a penalty taker in a keeper-independent situation. There is some evidence to suggest that increasing the number of deceptive cues presented could result in greater success for the penalty taker. Also, there is no difference in goalkeeper visual search between deceptive and non-deceptive conditions for most goalkeepers. Future research may verify the effectiveness of an increased number of deceptive cues presented and investigate the use of more variants of deception.

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