



DIRECTION CONTROL IN GOLF PUTTING FOR ELITE GOLF PLAYERS

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Introduction

According to a theory by Pelz (2000) the putter path is easier to control than the face angle of the club head. The variability in the control of these two parameters, as well as the variability of the point of impact with the ball, will decide the deviation of the putt relative to the aimed direction. Knowledge about this variability (standard deviation) is essential for putting stroke training design. Therefore, the aim of this study was to examine the variability of face angle, putter path and impact point for elite golf players at different putting distances.

Methods

Eight male elite golf players volunteered in the study. Two of them played on the PGA European Tour. The remaining subjects were either teaching professionals or top national amateur golfers (hcp +1.0 – 1.9). Each player hit 10 balls on 2, 8 and 25 m, on a flat, indoor artificial green, reading 11 on the stimp meter. After preparing the putter head with reflective markers, kinematic data were recorded by a 3-D motion capture system at 240 Hz (Pro Reflex, Qualisys AB, Gothenburg, Sweden).

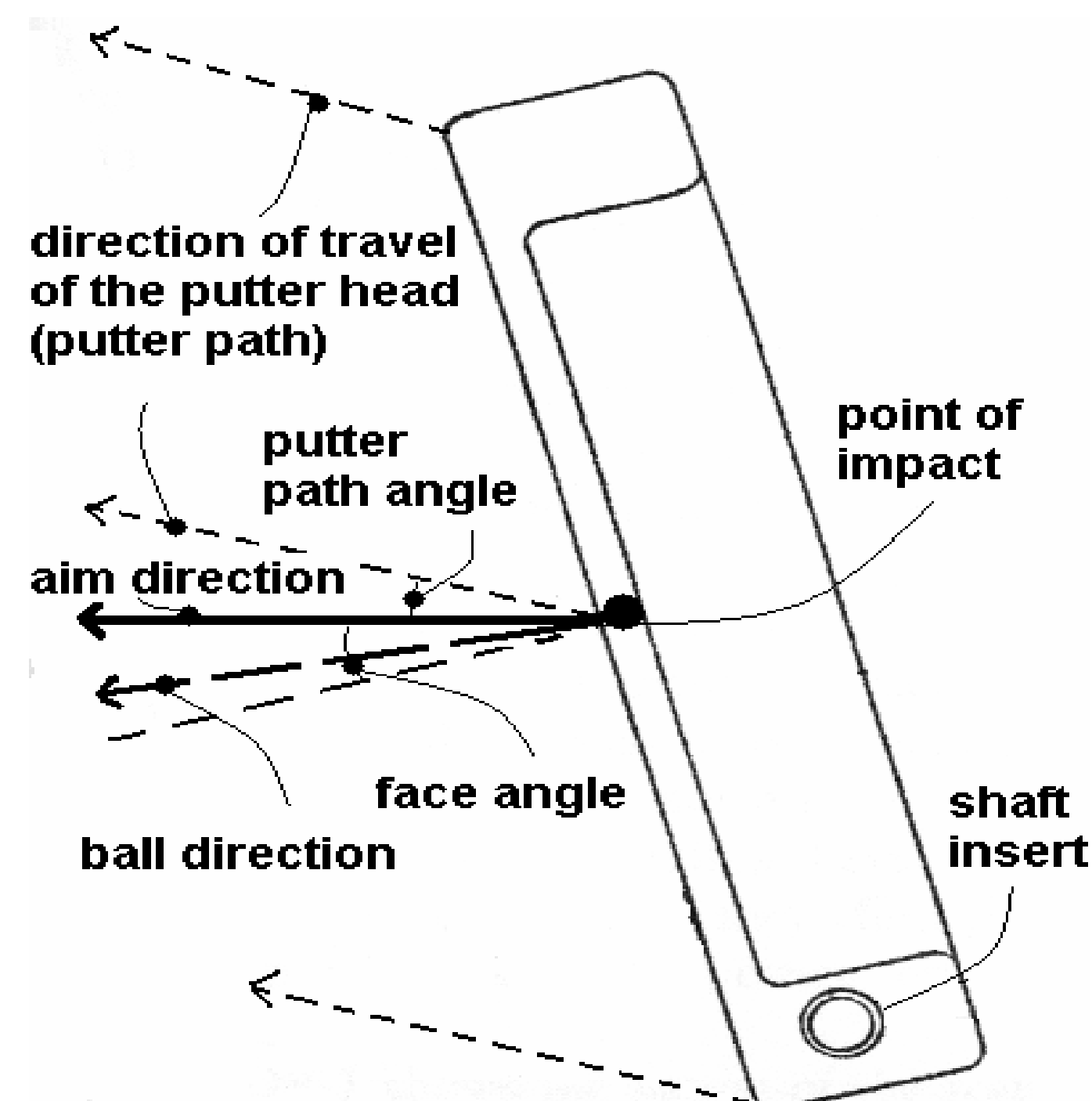


Figure 1: Top-view of a putter head and a schematic description of the research parameters.

Results

The results given in table 1, show that the variability was significantly larger in putter path than in face angle at 2 m ($p < 0.001$) and 8 m ($p < 0.05$), but there was no significant difference at 25 m. Variability in face angle and horizontal impact point are not significantly different at different putting distances. Variability in putter path are significantly larger at 2 m, than at 8 and 25 m ($p < 0.001$).

Table 1: Mean variability of face angle, putter path and horizontal impact point at different distances.

Putting distance	Face angle	Putter path	Impact point (horizontal)
2 m	0.5°	1.1°	2.8 mm
8 m	0.5°	0.7°	2.5 mm
25 m	0.6°	0.7°	3.4 mm



Figure 2: Putting test setup. Inset figure; top view of putter head with reflective markers.

Discussion

Since the player's stroke path was significantly more variable than the face angle, it is suggested that the theory forwarded by Pelz does not fit elite golf players at short and medium long puts. The constancy of face angle and horizontal impact point variability relative to putting distance, indicates that the accuracy in the neuromotor control of face angle and horizontal impact point may be unrelated to stroke intensity (i.e. stroke length). Putter path was more difficult to control at short puts, which may indicate that a certain putter head speed must be reached to gain optimum control of the putter path. Further research is needed in order to establish if the above also occur among novice golfers, and if there is an effect of training.

Reference

Pelz, D., *Dave Pelz's Putting Bible*, pp. 71-73, 85-89 and 259-260, Doubleday, New York (2000)