

Original Research

Improving Arm Positions during Golf Backswing to Improve Golf Ball Flight

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Abstract

Purpose

The purpose of this study was to compare changes in the clubhead speed, club angle of approach and swing kinematics of a popular golf swing teaching method with a less-known one, based on interventions made over a single one-hour session.

Methods

Two swing methods - 'rhythm' and 'position' were compared for their efficacy. Sixteen right-handed subjects - 2 female, 14 male - participated. Ages ranged from 20 to 76, and golf handicaps from +4 to -30.

During the session, swings were monitored using 53 retroreflective markers and near-infrared cameras. Each subject was randomly assigned one of the two methods, then made 10 pre-intervention shots, which were recorded; made 10-15 swings to practice the intervention swing; then made 10 post-intervention swings; once again, recorded.

The intervention for the 'rhythm' group required the subject to swing to a rhythm of 'one and' during the backswing, and 'two' during the downswing. The intervention for the 'position' group required the subject to keep the right arm as straight as possible; and swing the arms and the clubshaft in a straight line towards the subject's right foot, during backswing takeaway.

The recordings of the surface markers were then tracked and edited to produce three-dimensional coordinates as a function of the swing. The average of 1 to 6 shots pre- and post-intervention were used, as all swings were not 'trackable'. Based on the position-time data collected, specific angles and distances were noted, at four particular break-points during the

swing: 1) address, 2) clubshaft horizontal during backswing (90BS), 3) top of backswing (ToBS) and 4) impact. Clubhead speed at impact was also calculated. Independent, dependent, and Chi square tests were used to determine significant differences ($p < 0.05$).

Results

There were no significant changes in the rhythm variables for either group.

The position group showed several statistically significant kinematic changes.

The angle of approach of the clubhead to the ball reduced significantly for the position group, indicating a shallower angle of approach of clubhead to ball, along a horizontal axis.

There was no significant change in the angle of approach for the rhythm group.

Results for clubhead speed indicated that there was a significant increase for the position group from what was expected. No change was observed for the rhythm group.

Conclusions

This study was the first to compare two swing methods for efficacy. The comparison served to rule out any improvement taking place merely from random, undirected practice. It was also desired to study whether swing change can quickly show improvement.

The study was able to show an improvement in clubhead speed for the position method intervention in a small time frame. The post-intervention 'position' backswing was successful because: 'wide' arms can produce greater weight-shift for more clubhead speed. A straight-as-possible right arm forces the left arm and thus the entire left side of the body to move, creating weight shift. An 'inside' backswing path is more likely to promote the desired 'in-to-out' downswing path. Only the arms are used during backswing takeaway, so the arms and body remain in synchronization throughout the backswing, and the downswing is more likely to

commence in sequential order - lower body first - for greater power production. Keeping both arms as straight as possible keeps the backswing 'shallow' and allows the downswing to be similarly shallow. Less wrist-cock (bend) at the top of the backswing allows the club to be taken upto, and no further than, its position of maximum gravitational potential energy, thus harnessing gravity to help initiate the downswing. A final benefit of the recommended 'inside' movement of the position method is that it moves the right shoulder away from the ball during the backswing, thus reducing the chances of the upper right side of the body starting the downswing.

The 'position' method was able to shallow-out the downswing arc, which should lead to greater trajectory, and thus greater carry distance.

Two limitations of the study are that it was conducted over a single one hour session with no follow-up, and that all 10 swings 'before' and 'after' were not always trackable.

It can be concluded that it is possible to increase clubhead speed; reduce the angle of approach of the club to the ball; and make kinematic changes, in a short time interval, in a diverse range of club golfers.