

Biomechanical Analysis of the Pointing Skill in Petanque using the Roll
Technique at 6,7,8 and 9 meters

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Abstract

Introduction: In sports, motion capture has been used to record an athletes' movement in real time and analyze certain variables as physical condition, sport performance and injury mechanism, prevention and rehabilitation. A skill in the game of Petanque called 'pointing' involves throwing one's boules closer to the jack than one's opponent's boule. This can be achieved by performing various techniques such as a roll, a semi-lob or hi-lob. Specifically, the purpose of this study was to analyze the pointing skill in Petanque using the roll technique at 6, 7, 8 and 9 meters.

Methodology: The subject was videotaped with two cameras completing two sets for each distance with three trials per set. One camera captured entirely the movements of the subject while the other recorded the trajectory of the throws. Only the nearest and farthest measurement from both sets for each distance was used for analysis. With the subject's determined arm length, shoulder, elbow and wrist joint, movements were analyzed using the computational software MATLAB to determine initial angle, angle of the swing, linear acceleration and velocity at the wrist during the throw.

Results and Discussion: Results showed that the velocity of the wrist upon release for the nearest throws at 6,7,8 and 9 meters were 3.1, 2.9 3.5 and 3.7m/s, respectively, while the velocity of the boule upon release were 5.6, 6.0, 6.7 and 7.3m/s respectively. These demonstrate that while velocity increases, there is less velocity at the wrist than the boule. Furthermore, analysis between the nearest and farthest throws using the last frame of ball in hand revealed that the total angle of the swings of the farthest throws were less than that of the nearest throws, except at 7m where the total angle was greater. Increasing average linear accelerations were also observed except at 7m.

Conclusion: The angle of the swing, initial angle and average linear acceleration increases as range or distance of the thrower to the jack increases. Kinematics of the techniques in throwing changes as the distance of the thrower was altered. Analysis of the pointing skill will make important contributions in learning and mastery of the skill to enhance scoring opportunities in Petanque.

Key words: biomechanics, pointing, angle, velocity