

COMPARATIVE STUDY OF GIANT SWINGS ON THE PARALLEL BARS

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The purpose of this study was to provide descriptive and comparative data on kinematic data of giant swings on the parallel bars. Fourteen giants were studied. Results showed that, giants on the parallel bars exhibited larger range of motion in all joints as compared to giants in other apparatuses. No significant differences were found between (parallel bars) giants receiving larger or smaller deductions from qualified judges and this may be attributed to the (similar) skill level of the subjects.

KEY WORDS: giant swings, parallel bars, kinematics.

INTRODUCTION: Whereas giant swings performed on the high bar and uneven bars have been the subject of several investigations (Arampatzis & Brüggemann, 1998; Prassas, Papadopoulos & Krug, 1998), there is scarcity on scientific data for giants performed on parallel bars (Prassas et al., 2004). Similarities among giant swings performed in all apparatuses should be expected, but differences due to constraints in apparatus design and specifications may also exist. The purpose of this study was to provide descriptive and comparative kinematic data on giant swings (impeded Figure) on the parallel bars.

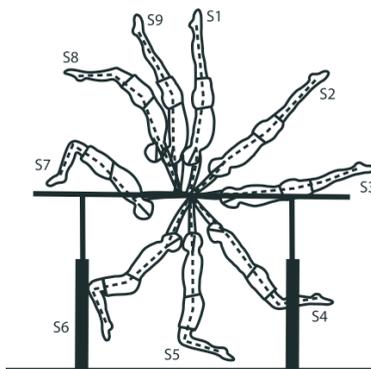


Figure 1: Giant swings on the parallel bars

METHODS: Fourteen giant swings performed by six gymnasts (4 collegiate level and 2 members of the Greek junior national team) were videotaped with a 60 Hz video camera and analyzed independently utilizing the Ariel Performance Analysis System (APAS). The videotaped performances were viewed by two international gymnastics judges and scored (deductions according to FIG Code of points, with 1.00 being a perfect score). Skilled giants were deemed the ones that had (average) deductions of less than 0.2 points. Unpaired t-tests, or Mann-Whitney rank sum tests (SigmaStat 3.5) were conducted to compare performance variables for the skilled/unskilled giants.

RESULTS AND DISCUSSION: Descriptive and comparative data is presented in Table 1. Partly due to constraints in apparatus design and specifications and "gripping", giants on the parallel bars exhibited, as expected, larger range of motion (ROM) in all joints as compared to giants in other apparatuses. However, no significant differences were found between giants receiving more or less deductions from qualified judges and this may be attributed to the skill level of the (sampled) gymnasts. When the giant swings receiving the most and least

deductions were qualitatively compared, the trend seeing on the overall data (greater knee and hip and less shoulder and elbow joint ROM for the skilled one) was more pronounced.

Table 1
Descriptive and Comparative Data (Mean, St. Deviation)

Item	All Giants (n=14)	Skilled (n=6)	Unskilled (n=8)
Total time (TT) (sec)	1.9 (0.111)	1.92 (0.104)	1.886 (0.121)
TQadrant1 (TQ1) (%)	35.9 (2.676)	35.46 (2.748)	36.39 (2.728)
TQ2 (%)	17.4 (1.173)	17.13 (1.412)	17.59 (1.015)
TQ3 (%)	17.03 (1.474)	16.23 (0.712)	17.63 (1.65)
TQ4 (%)	29.6 (3.611)	31.23 (3.586)	28.40 (3.332)
Knee J. ROM (deg)	109 (7.0)	110.93 (6.463)	108.241 (7.61)
Hip J. ROM (deg)	74 (18.6)	75.57 (10.693)	72.84 (23.637)
Shoulder J. ROM (deg)	71 (24.6)	59.03 (13.299)	80.36 (27.813)
Elbow J. ROM (deg)	50 (34.2)	40.7 (25.365)	57.16 (39.783)
CM maximum vel. (m/sec)	5.96 (0.697)	6.017 (0.688)	5.876 (0.745)
Average deductions	0.207 (0.154)	0.0917 (0.0492)	0.294 (0.150)

CONCLUSION: Results showed that, giants on the parallel bars exhibited larger range of motion in most joints as compared to giants performed in other apparatuses, particularly on high bar and uneven bars. The motion pattern of giants receiving smaller deductions from qualified judges didn't differ significantly from ones receiving larger deductions, however this may be attributed to the (similar) skill level of the subjects.

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