

RELEASE CHARACTERISTICS OF THE LONG HANG SWING UPRISE, MOY AND BACK GIANT SWING ON PARALLEL BARS IN MEN'S ARTISTIC GYMNASTICS

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Introduction

The cast to support on parallel bars has long been used as a transition skill from under-bar swings to backward swings in support. More recently the Moy has replaced the cast as the primary transition skill taught in Canadian Gymnastics. The Moy is either a required element or a development skill required in competitive boys level 3 (age 10-12) to level 6 (aged 16 up) in both provincial and national streams. Most often the Moy is first taught from a support swing but eventually from a straight body downswing from handstand when the goal is to catch the skill in support (Figure 1). This downswing resembles that of the downswing in back giants on horizontal bar and is therefore used as a precursor to giants on parallel bars (Figure 2).

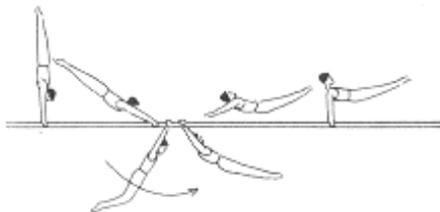


Figure 1. Moy from handstand to support

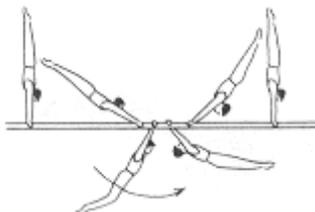


Figure 2. Giant swing backwards

As the gymnast grows both in skill and stature he must contend with the height constraint

imposed by the bars. This is generally manifested in a bent knee swing through the bottom of the swing. Prassas (2005) and Tsuchiya *et. al.* (2004), using college level gymnasts, both suggested close technique similarity between giants on horizontal bar and parallel bars except for this knee bend. This is also seen in the Moy using the 'giant downswing'. However a further progression of the Moy is a Tippelt or Moy piked. (Figure 3)

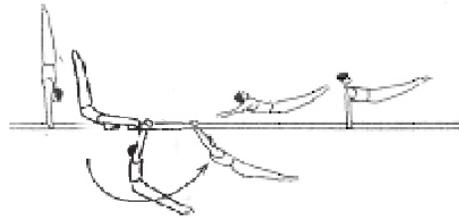


Figure 3. Moy piked (figures taken from FIG Code of Points, 2006)

Objective

The purpose of this study was to look at the Angular Momentum (H) characteristics of these 3 potential Moy downswings, *no height constraint*, *back-giant* and *Moy piked* and to compare these individual Moys to their giant technique used on parallel bars.

Design

Case study - quasi-experimental design.

Subjects

Three National level Junior male gymnasts volunteered and gave informed consent to participate in this study.

Intervention/Main Outcome Measures

3D data was collected using 4 Qualysis ProReflex cameras operating at 120Hz. Since the parallel bar rail obscures the wrist during some of the downswing, the wrist was also manually digitized using the APAS system and a synchronized video record (60Hz). **H**, taken about the wrist, was normalized by dividing the subject's mass times the square of their height (Hinricks *et. al.* 1983).

Main Results

The purpose of the downswing is to create the necessary conditions for release and catch with sufficient momentum for a smooth transition into the next element. Table 1 lists the **H** maximums, where they occur in the downswing and the body configuration at those points. The angle of incidence is the angle formed between a right horizontal, the wrists and the body's CM. Both subject 1 and 3 kept straight legs during their Moys due to no height restriction and a piked hip respectively. All subjects had similar shoulder and hip angles in their giants.

Conclusions

Tsuchiya *et. al.* (2004) discussed the

importance of shoulder flexion during the up swing following shoulder extension during the tap in the bottom of the swing. Subjects 1 & 2 had greater similarity between their positions at maximum **H** with noted differences in the hips in the giants. The shoulders are more flexed in the Moys in preparation for release where the hips are fully extended in all cases. However, the Moy piked had the least shoulder flexion than any of the skills.

Source of funding:

Sport Science Association of Alberta (SSAA) through the ASRPWF.

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Commentary

This case study provided evidence of good similarity between the giants and the developmental skill (Moy) but not the more advanced Moy piked.

Table 1 Angular Momentum

Subject	Handstand height (m)	Skill	Ang Mom (/s)	Ang Incidence °	Shoulder °	Hip °	Knee °
1	1.162	Moy	2.73	226.3	161.2	218.9	160.4
		Giant	3.40	284.6	149.6	185.7	162.6
2	1.343	Moy	3.59	264.8	170.9	165.6	80.7
		Giant	2.65	265.2	156.6	181.9	88.1
3	1.318	Moy	2.34	284.0	143.7	126.9	174.1
		Giant	2.92	278.4	153.9	190.8	86.2