THE INFLUENCE OF EXPERIENCE ON FUNCTIONAL PHASE KINEMATICS OF THE LONGSWING

Genevieve Williams, Gareth Irwin and David Kerwin
Cardiff School of Sport, University of Wales Institute, Cardiff, UK

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INTRODUCTION: The biomechanics of successful longswings are well understood, however, the influence of experience on execution is not well defined. This study aims to explore functional phase (FP) kinematics during repeated longswings performed by an experienced (E), inexperienced (I) and novice (N) participant.

METHODS: Three participants performed five sets of five longswings on a high bar. Data were collected using an automated motion analysis system (CODA CX-1), sampling at 200Hz. Circle angle ($\theta_C$) was defined by the mass centre to bar vector with respect to the horizontal. Kinematics of FP’s, defined by maximum shoulder flexion to extension ($\theta_{CS}$) and hip extension to flexion ($\theta_{CH}$), were analysed during swing three and four in each set.

RESULTS AND DISCUSSION: Variability of the start (1) and end (2) of the functional phases ($\theta_{CS12}$ and $\theta_{CH12}$) were larger for participant I however, the range of the FP remained similar to that of participant N. These results suggest that the timing of FP initiation may well be important in the development of this particular skill (Figure 1). The joint angle changes within the respective functional phases were smallest for E, and largest for N, where $\theta_{CS12}$ and $\theta_{CH12}$ occurred earlier. It is likely that these findings reflect the mechanical result of an early onset FP with increased shoulder and hip angles, indicating that the action and timing of the functional phases is critical in facilitating the mechanical demands of successful longswing performance (Irwin & Kerwin, 2005).

CONCLUSION: These results show that kinematic analysis throughout the development of the longswing can be a valuable tool in identifying key variables required for skill progression. Current work is examining more participants of varying experience.