

BIOMECHANICAL MEASUREMENT AND EVALUATION FOR WUSU COMPULSORY PROGRAM

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INTRODUCTION: The Wushu compulsory program is a new form of competition. It differs from the Wushu optional program in that all the athletes must execute the same compulsory program. Following this, judges assess the level of expertise of athletes, by scores gained, based on their performance.

The comparability and objectivity in grading a compulsory program is better than in an optional program. So it is feasible to analyze technique of the Wushu compulsory program using a biomechanical measuring method. The compulsory exercise described as, "the turn about for flying kick on the right", was measured and analyzed quantitatively in this paper. With the calculations from this study, a new evaluation factor and advanced development of competitive Wushu was developed.

METHODS: Three athletes were selected from the Shanghai Wushu Team as experimental subjects. Test equipment is Motion Analysis System (made in America). It is one of the best apparatus in the world. The Experiments were in progress in Biomechanical Lab of SRISS. Some parameters were collected as testing indexes, including stick graph of body motion, position curve of right foot and shoulder, dip angle of trunk, relative position between the center of body and foot, and reacting force and moment from ground. The test process is as follows: First, the MAS at high speed, captured all the films of athletes, twice executing one set of the compulsory program,. Second, the selected parameters were obtained on the films by the EVA software of MAS.

RESULTS: Through analyzing the parameters calculated, the athlete's compulsory program was quantitatively evaluated. In the first exercise, the athlete's execution was not good and included three faults:

- 1) Dip angle of trunk of the athlete was too high for stability in standing during dismount phase.
- 2) The foot was lower 25.4cm than shoulder at slap foot.
- 3) The distance was too great between the center and foot of the athlete at dismount.

In the second exercise, the athlete's execution was better but still not in full accord with the requirements. Problems were found on the graph of reacting force and moment from ground. The biggest vertical force F_z was 2047N and the horizontal forces F_x, F_y (about 1000N) were bigger the first time. This is an fundamental reason for an unstable dismount and exposes the athlete to the danger of injury to the foot.

DISCUSSION: From the analyses provided by this study, new indexes of evaluating the compulsory program, have been calculated and can be considered as a form of scientific judgment of competitive Wushu. For example, it is possible to judge the stability of the fall of an athlete by measurement of horizontal force and the completion of jump by the height of the foot. This new research has been explored and it is felt that it will provide a future for theoretical analysis, which can be verified in practice.

REFERENCES:

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