CALL FOR STUDY PAPERS (POSTERS)

8th ANNUAL ETSU, COACHES COLLEGE

December 13th – 15th Millennium center, ETSU

Johnson City, Tennessee

The Center of Excellence in Sports Science and Coach Education (CESSCE) will be hosting posters for its 8th annual Coaches College. The subject *__matter must deal directly or indirectly with the enhancement of competitive athletes and coaches__*. Posters can deal with advances in coaching, coaching methods, biomechanical, psychological, physiological, or sports medicine aspects.

Posters will be accepted on the basis of study summaries (information on next page) submitted by e-mail. The deadline for submission is November 15th, 2013. Notification of acceptance/rejection will be sent via email within 1-2 weeks. Incomplete submissions will not be accepted. Please note that posters that have not gone through the approval process will not be displayed at the conference.

The summaries will be published on the CESSCE website (www.sportscienceed.com) after the conference.

For questions about the submission process, summaries, posters or other questions, please email Dr. Michael Stone at stonem@etsu.edu.

Awards will be given in the following categories:

__Coaching/Coach Education__
1st place - $100
2nd place - $50

__Sports Science__
1st place - $100
2nd place - $50

Outstanding student Poster- $100

Specific Requirements for Submissions:

Summaries should be concise, and contain sections (with headers) dealing with: introduction/purpose, methods, results, discussion, and practical application. This is not simply a 250 word abstract, but a more comprehensive discussion of research project. Each section should contain a short (but sufficiently detailed) write-up of relevant information. Summaries should be limited to 3 pages. Expected from each section is:

Introduction/Purpose: summarize briefly the necessary background information to support the necessity of your work, and why it is important. Clearly identify your purpose and specific aims in pursuing this particular project.

Methods: provide sufficient detail of the experimental design, including subjects, instrumentation, IRB approval and informed consent of participants, and methods of data analysis.

Results: should include representation of data using figures and tables that relay your main findings. Can include descriptive statistics.

Discussion/Practical applications: Briefly discuss the implications of your findings, and the practical application/significance of them.

An example is provided at the end of the document.

Specific Requirements for Posters

Posters should fit a standard size display: posters no larger 4 ft x 4 ft. (122 cm x 122 cm). Posters should not be on a backing board. Push pins may be available, but are not guaranteed to be available.

Posters must be up by Friday morning at December 13th at 8:00 am – judging will take place during all breaks – primary authors are expected to stand with their posters during afternoon breaks and from 5:00pm until 5:45 pm on Friday.

Helpful suggestions for creating posters:

Be aware that most people will view your poster from a small distance, use at least 18 point font. In the event that you are temporarily unable to stand by your poster, be sure that the poster is able to stand alone, and provide a coherent and straight forward story to the reader. Emphasize your most important points, and avoid overwhelming the reader with too much detail. Keep the content of your poster clear and accessible to both coach and scientist alike.

Tables & Figures: Keep tables and figures uncluttered, and try to use strong visual contrast. Avoid using too many extraneous graphics (e.g. watermarks, pictures/graphics behind text), to ensure that the focus is on your content.

Example Summary:

RELATIONSHIP BETWEEN ISOMETRIC FORCE CHARACTERISTICS AND THE DIFFERENCE IN UN-WEIGHTED AND WEIGHTED VERTICAL JUMP HEIGHT

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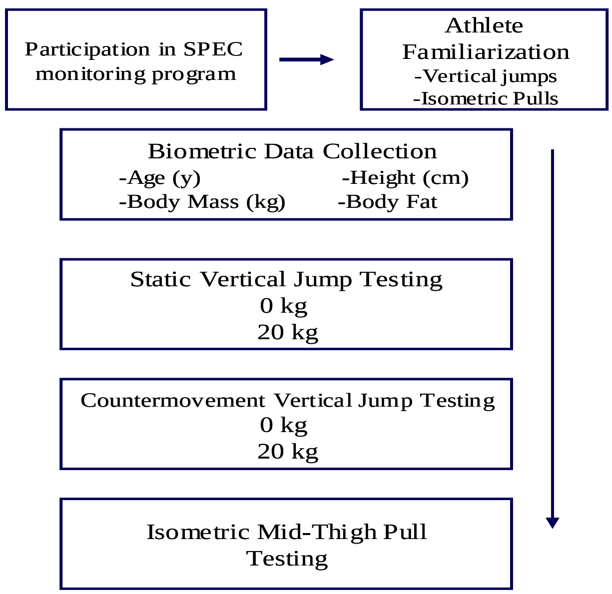
Introduction: Weighted and unweighted jumps may provide insights into both mechanistic and practical aspects of explosive performance. So, for strength and conditioning professionals, the monitoring of vertical jump height and jump height responses under various loading conditions is easy to perform and may be a practical assessment tool that is specific to the characteristics observed in sport. Therefore, the purpose of the current investigation was to examine the relationships between isometric force time-curve characteristics and markers of unloaded and loaded vertical jump performance. A primary purpose was to examine the relationships of maximal strength to these characteristics.

Methods: Forty-one female and twenty-two male USA Collegiate Division I athletes ($n = 63$) active in track and field, tennis, softball, soccer, and volleyball participated in the study. Athletes read and signed written informed consent documents pertaining to the long-term athlete monitoring program and all testing procedures in accordance with the guidelines of East Tennessee State University's Institutional Review Board.

Athlete height was measured using a stadiometer and recorded to the nearest 0.1 cm. Body mass was determined using an electronic scale and body composition was determined with, air displacement plethsmography (BodPod, Life Measurement Incorporated, Concord, CA). Vertical jump height was derived from flight time using a force plate. Maximum strength characteristics were measured by an isometric mid-thigh pull. Isometric peak force (IPF), force at 50, 90 250 ms and rate of force development (IRFD) were measured by force-time curve analyses using customized signal processing software (LabView, National Instruments, Austin, TX). Reliabilities for these measures were excellent ($ICC\alpha \geq 0.88 – 0.99$)

Relationships between variables were assessed using a Pearson correlation procedure. Additionally a subgroup (n = 6) of the strongest five percent of males and females (3 males + 3 females) were compared to a subgroup (n = 6) of the weakest five percent males and females (3 males + 3 females). Athletes were placed into weak or strong groups according to their allometrically scaled isometric peak force values (IPFa). Independent samples t-Tests were used to assess differences between means (strong group IPFa = 232.4 ± 28.4 $N/kg^{0.67}$, weak IPFa = 123.18 ± 18.87 $N/kg^{0.67}$, (p ≤ 0.05). Due to the large number of pair-wise comparisons between groups, the Holm's Sequential Bonferroni method was used to control for type I errors. Cohen's effect sizes (*d*) were also calculated. The experimental design is shown in Figure 1:

Fig. 1 Basic Experimental Design



Results: Athletes (n = 63) were 19.9 ± 1.3 yrs.; 172.8 ± 7.7 cm in height and their body mass was 72.9 ±19.6 kg. There was a very strong correlation between IPF and IRFD (*r* = 0.88, p ≤ 0.05) agreeing with previous literature (1, 2). IPF showed moderate to strong correlations with F50 (r = 0.85), F90 (r = 0.42) and F250 (r = 0.93). Correlations of IPF and percent decrements in jump height ranged from moderate to strong negative correlations indicating stronger athletes lost less height. Compared to weak athletes, strong athletes had greater values for all force measures and for IRFD (p ≤ 0.5). Differences between strong and weak groups showed that stronger athletes jumped higher (SJ 0kg = 30.8 ± 9.7 vs 23.7 ± 4.9 cm, p ≤ 0.5, *d* = 0.92; CMJ 0 kg = 33.5 ± 10.8 vs 28.3 ± 6.3 p ≤ 0.05, *d* = 0.60; SJ 20 kg = 25.4 ± 8.3 vs 16.7± 4.8 cm, p ≤ 0.05, *d* = 1.28; CMJ 20kg = 27.6 ± 8.6 vs 18.7 ± 5.3, p ≤, *d* = 1.24). The strong group had smaller decrements (SJ = 17.8 ± 3.4 vs30.4 ± 7.8 %, p ≤ 0.5, *d* = 2.10; CMJ =17.4 % ± 4.8 vs 34.5 ± 7.8 %, p ≤ 0.05, *d* = 2.65).

Discussion: Three important findings were associated with the current investigation: First, strong relationships were observed between maximum strength (IPF), IRFD and F50, F90, F250. It is unclear exactly why increased maximum strength is associated with increased RFD, but it may be related to alterations in the H-reflex. Second was the association of maximum strength characteristics (e.g. IPF, IRFD) with jump capabilities. Additionally, assuming that the isometric measures are indicative of striking, sprinting and jumping (i.e. force at 50, 90, and 250 ms) then stronger athletes measured in this manner can produce superior results in these activities. The third important finding was the observation that stronger athletes have smaller decrements in vertical jump heights associated with weighted jumps compared to weaker athletes. There are several potential underlying reasons for these observations. Training studies have shown increases in neural drive (IRFD) associated adaptations in contractile strength of skeletal muscle (2). Furthermore, athletes that are found to be more explosive, which may be strongly related to their nervous system capabilities, are often found to possess high levels of strength. Thus maximum strength appears to be an important underlying mechanism that influences both un-weighted and weighted jumping and by extrapolation, explosive exercises.

References:

1. Aagaard P, Simonsen EB, Andersen JL, Magnusson P, Dyhre-Poulsen P. Increased rate of force development and neural drive of human skeletal muscle following resistance training. *J Appl Physiol* 2002 October: 93(4):1318-26.

2.. Stone MH, Sanborn K, O'Bryant HS et al. Maximum strength-power-performance relationships in collegiate throwers. *J Strength Cond Res* 2003 November: 17(4):739-45.