potentially large consequences for various types of stakeholders. The present study analyzes whether certain personality traits improve referee decision-making.
Methods. Seventy-five referees with different levels of expertise evaluated thirty tackle situations taken from international matches, after which they completed a Big Five personality test based on the Mini-IPIP (Donnellan, Oswald, Baird, & Lucas, 2006). Reference decisions provided by an expert panel served as benchmarks to assess accuracy (Spitz, Moors, Wagemans & Helsen, 2018).
Findings. Personality affected decision-making style and performance. More extroverted participants tended to make stricter decisions, while more agreeable participants tended to make softer decisions. With respect to performance, only agreeableness had an effect: participants who were more agreeable made less accurate decisions. Conscientiousness, Neuroticism, and Intellect neither affected decision-making style nor performance. The effects remained after controlling for expertise and sociodemographic variables.
Implications. The results can help to improve the education of referees by paying more attention to the analysis and targeted enhancement of the personality of referees. Specific selection procedures, as well as targeted personality development programs, could improve the accuracy of referee decision-making.

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Conventional Print Poster

CP-MI10 Strength and power

RELIABILITY OF POWER AND VELOCITY VARIABLES COLLECTED DURING THE BENCH PULL EXERCISE

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INTRODUCTION: Load-velocity and load-power relationships play a significant role in many modern training programs. Many studies have researched the reliability of power and velocity variables of different exercises such as the bench press or the vertical jump (1,2). However, no studies are available regarding the reliability of pulling movements. Therefore, this research aimed to examine the reliability of different power and velocity variables during the bench pull exercise performed with a Smith machine and with free-weights.
METHODS: Eleven male well-trained subjects (age 24.3±2.4 years, body mass 81.1±5.1 kg, height 182.9±2.4 cm., 1RM 100.6±9.6 kg.) performed four sessions of the bench pull exercise. In a counterbalanced order, participants completed in the first week 2 sessions of 2 repetitions with 5 incremental loads (50%RM, 60%RM, 70%RM, 80%RM, 90%RM) on a Smith machine and in another week two sessions with the same loads with free weights. The test was monitored by a linear position transducer (GymAware PowerTool, Australia). Mean velocity, peak velocity, mean power and peak power of the best repetition of each set were used for statistical analysis. Reliability was assessed through the coefficient of variation (CV) and a CV ratio of 1.15 was considered the smallest important ratio.
RESULTS: The Smith machine test was more reliable than the free-weights test (4.99% vs. 8.20%; CVratio = 1.64). Velocity values were more reliable than power values (5.34% vs. 8.08%; CVratio = 1.51). No significant differences in reliability were observed between the mean and peak values (5.82% vs. 6.00%; CVratio = 1.03).
CONCLUSION: These results support the use of a Smith machine and velocity variables for testing bench pull performance with a linear position transducer in well-trained subjects. From a reliability standpoint, mean velocity and peak velocity values can be used for assessing bench pull performance under several loading conditions.
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LOAD DISTRIBUTION DURING SUSPENSION TRAINING EXERCISE

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INTRODUCTION: Suspension training (ST) uses body weight in multi-directional movements as a form of exercise and due to its feasibility promotes a large variety of workouts within a low space occupancy. However, only few studies (1,2) investigated the load distribution during ST, especially during pulling exercises. Therefore, the aims of this study were to evaluate body inclination and ground reaction force and to predict equations to estimate the training load distribution during ST static back-row at different length of the straps.
METHODS: Thirty volunteers (men=16, women=14; age=23.3±1.7years; body weight=63.9±13.3kg; height=167.9±9.2cm; Body Mass Index [BMI]=22.5±3.4kg·m-2) performed 14 static ST back-row (holding for 5s) at seven different lengths of ST device (148cm, 158cm, 168cm, 178cm, 188cm, 198cm, 208cm) ranging from the simplest to the most challenging, in 2 different elbow (flexed, extended) positions. A ST device (AINS ST FIPE, Italy) was anchored at 2.65m above a force platform. Subjects stood barefoot on the force plate, with their feet shoulder width apart positioned under the anchored point and visual reflective markers applied to subjects' left lateral malleolus and at the acromion process. The force platform was used to evaluate the ground reaction force, whereas a video camera was used to record all the trials. The recorded videos were then analyzed to calculate the body inclination angle with respect to the horizontal plane. Ground reaction force and body inclination were used to predict training load equations trough multi-level regression models ($P<0.05$).
RESULTS: Two multi-level regression models were created. In the first one, ground reaction force was used as dependent variable, whereas body inclination angle, body weight, height, BMI and elbow position were used as independent variables. Significant effects were found for all variables included in the model, with an Intraclass Correlation Coefficient (ICC) of 0.31. Analyzing the model, the follow-

ing equation to estimate the ground reaction force was extrapolated: Load=-132.9134+0.3724671·Angle-1.299028·Body weight+0.9844512·Height+3.675008·BMI-2.073684·Elbow.
In the second model (ICC of 0.37), the body inclination angle was replaced by the ST device's length. By analyzing this model, the following equation to estimate the ground reaction force knowing the length of the straps was extrapolated: Load=-69.80267-0.2199257·Length-1.281452·Body weight+0.8883487·Height+3.624841·BMI+5.188559·Elbow.
CONCLUSION: The proposed models could provide different methods to quantify the training load distribution, even if the use of the straps' length could result easier and faster than body inclination angle, helping practitioners and instructors to personalize the workout to reach specific purposes and provide load progression.
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Key-words: body weight; instability; back-row; resistance training; functional training; biomechanics

CORRELATION BETWEEN POWER CAPABILITIES AND TROWING PERFORMANCE IN FEMALE ATHLETES

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INTRODUCTION: In throwing events the power production capabilities can have a large impact on athlete's performance. This study aims to establish the relationship between parameters assessed in a jump protocol and performance in female athletes.
METHODS: 27 young regional and national level female throwers (age 18.9 ± 2.7 years, height 1.70 ± 0.09 m, body mass 78.7 ± 16.4 kg) were selected to take part to regional level training camps with a four-monthly cadence. During those camps, athletes jumping performance was assessed in the following tests: squat jump (SJ), countermovement jump with fixed arms (CMJ), countermovement jump with arms swing (CMJa) and multiple jumps with arms swing for 8 seconds (MJT). Jump height was computed from flight times measured by an optoelectric system (Optojump, Microgate, Bolzano, Italy)(Glatthorn et al., 2011). Additionally, relative power (Prel) and absolute power (Ptot) produced in MJT were computed (Landolsi et al.). Season's best performance for each participant was collected and standardized for discipline's world record (SBS). Correlations between performance parameters and SBS were tested using Pearson's product moment correlation coefficient.
RESULTS: SBS showed neither correlation with height reached in all jump test nor Prel in MJT. Otherwise, a significant correlation was established between SBS and Ptot (0.673; $p<0.001$) and SBS and Bodymass (0.717; $p<0.001$).
CONCLUSION: The results are in accordance with recent literature showing significant linear correlation between SBS performance and ability to generate power. Bourdin et al. (2010) did not found correlation between relative power measurements and SBS in male national level throwers, while half squat Ptot, bench press Ptot and body mass were significantly correlated. In that study, body mass showed a lower correlation with SBS ($r=0.540$; $p<0.001$) than our results, possibly suggesting a larger impact of body mass on performance for female subjects. In another study, while testing national level male shot putters, MJT absolute power showed significant correlation ($r=0.810$; $p<0.01$) with SBS whereas MJT relative power was not correlated (Landolsi et al., 2015). The present study widens current literature on the importance of power production towards throwing performance in female athletes. Thus, showing how body mass seems to play a key role for female athletes, training practice should be adapted accordingly.
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CHANGES IN EMG ACTIVITY OF GLUTEUS MAXIMUS AND STRENGTH AFTER SQUAT MASTERING PROGRAM – CASE STUDY

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INTRODUCTION: There is a disagreement of previous studies about EMG activity of gluteus maximus muscle during squat exercise (1,2,3,4,6). It indicates potential impact of squat variations (3,4), movement experience (5) and bar placement (6) on the differences in EMG activity of muscles of lower extremities. In this study we track how the squat mastering program will change EMG activity of gluteus maximus and maximal isometric force.
METHODS: Two male subjects without previous experience with squat exercise were randomly divided into experimental (EXP) and control (CON) group (EXP: age, 20.8 years; height, 185 cm; weight, 81 kg; CON: age, 19.9 years; height, 182 cm; weight, 82 kg). EXP subject performed 3-weeks deep squat mastering program which consisted of eleven training sessions aimed on mastering the squat without any attention for strength development. Pre and post program tests were: maximal isometric force (ISOmax50°,90°) and rate of force development (RFD0-200ms;50°,90°), measured by dynamometric platform (Fitro Force Plate, SVK) in two different angles (50° and 90° of knee flexion). EMG activity (maximal value - EMGmax50°,90° and integrated EMG activity of full contraction - EMGint50°,90°) of gluteus maximus muscle of dominant leg was measured during the test by EMG Delsys Tringo Wireless System (UK). This paper was created with support of VEGA MŠVVaŠ SR and SAV č. 1/0333/18.
RESULTS: There were found changes of EMG activity and strength in EXP subject (followed squat mastering program) and CON subject (without squat mastering program intervention). ISOmax50° in EXP increased by 7.8 % (+129 N), ISOmax50° in CON increased by 3.1 % (+75 N), RFD0-200ms,50° in EXP increased by 31.4 % (+1,1 N.ms-1), RFD0-200ms,50° in CON decreased by 5.9 % (-0,2 N.ms-1), EMGmax50° in EXP increased by 151.8 % (+188 μV), EMGmax50° in CON decreased by 30.9 % (-26 μV), EMGint50° in EXP increased by 182.6 % (+126 μV.s-1), EMGint50° in CON decreased by 21.2 % (-11 μV.s-1), ISOmax90° in EXP increased by 9.5 % (+219 N), ISOmax90° in CON increased by 0.8 % (+21 N), RFD0-200ms,90° in EXP increased by 31.4 % (+1,1 N.ms-1), RFD0-200ms,90° in CON decreased by 6.3 % (-0.2 N.ms-1), EMGmax90° in EXP increased by 10.1 % (+28 μV), EMGmax90° in CON decreased by 32.9 % (-50 μV), EMGint90° in EXP increased by 35.3 % (+60 μV.s-1), EMGint90° in CON decreased by 31.2 % (-29 μV.s-1).