



24th Annual Congress of the
EUROPEAN COLLEGE OF SPORT SCIENCE

3 - 6 July 2019, Prague - Czech Republic

Hosted by: Charles University Prague

BOOK OF ABSTRACTS

Edited by:

Bunc, V., Tsolakidis, E.

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ISBN 978-3-9818414-2-8

CONCLUSION: The results of this study indicate that no correlation between basic anthropometric parameters and jumping height among female volleyball players were found. Nowadays, many volleyball coaches are used to identify talented individuals mainly according to the body height, but it is important that talent identification process should also consider jumping and speed abilities. With respect to the length not only of the game but also of the whole season we recommend to improve not only speed and jumping abilities but also endurance during preparatory period.

1) Vaeyens et al., Sport Med., 2008.

2) Sheppard et al., J. Strength Cond. Res., 2012.

Conventional Print Poster

CP-MI02 Training and testing I

EEG PRIOR TO GOLF PUTTING WAS MODULATED BY PREVIOUS PERFORMANCE

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INTRODUCTION: Previous electroencephalography(EEG) studies have shown that several frequency components, such as theta, alpha, and low beta, were associated with skilled performance. These EEG components have been suggested as reflecting focused attention, reduction of working memory involvement, and automatic processes, respectively. The purposes of this study was to examine how these EEG components would be modulated by previous performance outcome. We hypothesize that previous failure will result in the reinvestment of the neural resource due to the need for the adjustment of the preparatory.

METHODS: Thirty healthy right-handed male, pre-elite golfer (handicap <30) were recruited. The participants were requested to perform 60 putts while EEG were recorded. The theta, alpha, low beta (12-15 Hz) from Fz, Cz, Pz, and Oz were compared between previous successful and failed trials.

RESULTS: We reported only effects related to previous performance. Results showed that only theta power after a failed trial ($1.723 \pm .08$) was lower than that of successful ones ($1.62 \pm .078$). No other previous performance related effects were observed for alpha and low beta.

CONCLUSION: The present study assumed that performance failure will trigger the reinvestment of neural and attentional resource into the preparatory processes for the skilled golfers. We observed that theta power was higher after the previous failure than that of previous successful putts. Since theta has been associated with working memory loading, this finding suggests that previous failure increased the involvement of working memory during the preparatory processes. The role of working memory on skill adjustment should be further investigated.

RELATIONSHIP BETWEEN PERFORMANCE AND EMOTIONAL STATE IN BASKETBALL THREE-POINT SHOTS

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INTRODUCTION: In basketball, it is believed by players, coaches, and fans, that a player who has succeeded in a series of shots would be successful in the subsequent shots because the shooter gains confidence on displaying high performance. Although this "hot hand" phenomenon was reported as a misrecognition that happens only accidentally by Gilovich et al. (1985) (1), many studies support its existence as a real phenomenon. Unfortunately, no experiment has ever been conducted to examine the continuity of successful shots and the relationship between shooting performance and the shooter's emotional state by experimentally setting a continuous shooting scene. Therefore, we aimed to examine it by three-point shots (3PS).

METHODS: Twenty six collegiate basketball players (19.96 ± 1.18 years) participated in this experiment and each of them made 100 shots (10 shots x 10 sets). Then, they responded to a two-dimensional mood scales (TDMS; with four factors of vitality, stability, pleasure, and arousal) and a question item of "self-confidence to shot success" every 10 shots (between each set) to self-evaluate their emotional state. The analysis items were the numbers of the successful shots in the most and least successful sets, the scores of the "self-confidence to shot success", and each score of the four factors of TDMS. The differences in the mean values of the emotional state scores before and after the most and the least successful sets were then compared by using a corresponding T-test.

RESULTS: By comparing the difference of the mean values between the emotional states before the most and the least successful sets, a significant difference ($p < .05$) was found in "self-confidence to shot success", "vitality", and "arousal". By comparing the difference between these mean values after the same sets, a significant difference ($p < .05$) was confirmed in "self-confidence to shot success", "stability", and "pleasure".

CONCLUSION: The emotional state was involved in the performance change even in a short period of time during the continuous task of running 3PS. It was confirmed that shooters with less confidence on the success of their next performance had higher succeeding rate in the subsequent 3PS. The high probability of 3PS success was shown to be associated with evoking calm, comfort, and confidence as subsequent emotions. Since negative emotions narrow attention and enhance local cognition and treatment (Fredrickson and Branigan, 2005) (2), it was inferred that in 3PS, a closed skill movement, expression of positive emotions did not affect the subsequent performance, but the negative ones did.

1) Gilovich, T., Vallone, R., and Tversky, A. (1985) The hot hand in basketball: On the misperception of random sequences. *Cognitive Psychology*, 17: 295-314.

2) Fredrickson, L. B. and Branigan, C. (2005) Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion*, 19(3): 313-332.

PHYSIOLOGICAL PROFILES OF YOUNG PILOTS OF AN ELITE DRIVER ACADEMY

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INTRODUCTION: Car racing demands high level of physical and mental fitness (1). However, driver-athletes have not been comprehensively evaluated and tuned to the same degree as cars (2). Some studies have investigated the energy cost of race car driving using

actimetry (3) or physical demands, injuries, and conditioning practices by mean of surveys (4). Therefore, the aim of this study is to define the physical characteristics of young pilots, by comparing data with ACSM guidelines for young adults (5).

METHODS: 8 male pilots (Age:18±2.1years; Height:173.3±5.2cm; Weight:62.6±3.2kg) from an elite driver academy were administered body composition, lower back and hamstrings' flexibility (Sit and Reach test-SR), upper (UL, Handgrip Test) and lower (LL, Squat Jump Test) limb strength evaluations and maximal oxygen consumption (VO₂max) measured during an incremental cycling test.

RESULTS: Participants showed good levels of UL strength (left limb: 47.7±8.3 kg; right limb: 51.4±4.8 kg; total: 101.7±8.9kg), low levels of LL strength (35.6±4.2cm; 2491.9±295.6W), and SR (18.2±4.5in), whereas high aerobic level emerged (VO₂max:44.3±3.9ml/kg/min).

CONCLUSION: Considering the stresses (g-forces, vibration, raised temperature, muscular effort and emotional stress) to which racing drivers are exposed (6) it is important for young drivers to achieve an optimal physical fitness condition to be able to achieve advanced race categories.

Therefore, further research is needed to investigate the effects of specific training programs aimed to improve the aerobic power (to better respond to the high temperatures inside the cockpit) in association with strength trainings (to reduce the muscular effort caused by vibrations and g-forces) with the goal of reducing the physical stress during competition, the injuries risk and preventing post-exercise soreness.

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1. C. Raschner et al. Journal of Sports Sciences 31(1), 58-65 (2012)
2. N. Owen et al. Procedia Engineering 112, 344-348 (2015)
3. B. Beaune et al. Journal of Strength and Conditioning Research 24(11), 2927-2932 (2010)
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5. ACSM's guidelines for exercise testing and prescription. Lippincott Williams & Wilkins (2017)
6. C. Bertrand et al. 1st International Congress of Sport Automobile, Marseilles (1983)

Keywords: young athletes, car-racing, fitness testing

ESTABLISHING A PROTOCOL TO MEASURE SIMPLE AND CHOICE STATIC EYE-HAND RESPONSE TIME USING FITLIGHT TRAINER™ SYSTEM

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INTRODUCTION: Response time (RT) has long been investigated in different specialties, including sports science, medicine, and psychology. However, there is no standardized protocol or universal tool developed until now that enables a fair comparison of reported results.

METHODS: We designed a protocol to measure simple and choice eye-hand RT using the FITLIGHT Trainer™ System (FTS). Test-retest reliability was done among 12 karate athletes. A total of 310 healthy subjects aged 6 to 60 were recruited to observe the norm of RT for both sex and age groups. RT was measured in five conditions: simple RT at zero and shoulder distance (SRT_zero, SRT_shoulder), choice RT at zero, shoulder and random distance (CRT_zero, CRT_shoulder, CRT_random).

RESULTS: The interclass correlations of RT measurements among karate athletes were 0.70-0.95 for dominant hand and 0.80-0.94 for non-dominant hand. The result indicated a good test-retest reliability for FTS. The average eye-hand RT demonstrated by the karate athletes were 302.5±50ms, 322.89±62.99ms, 397.54±80.18ms, 430.00±63.6ms and 454.30±86.47ms for SRT_zero, SRT_shoulder, CRT_zero, CRT_shoulder and CRT_random, respectively.

Eye-hand RT is significantly better in males than in females. It gradually improved during childhood, peaked during the 20s, and maintained during middle age. The norm of simple RT at zero distance was 500±114.98ms for young children (6-9 years old) which gradually reduced to 390.11±82.53ms in teenage phase (16-18 years old). Healthy adults maintained their simple RT at zero distance at about 320-490ms from their 20s to 50s. Dominant hands were consistently faster in RT than non-dominant hands. Hand dominancy showed similar patterns to age group and sex difference. Basic requirements for a standard protocol for RT measurement included best-corrected vision and subject's distance from the device. Our proposed protocol using FTS yielded more precise eye-hand RT in milliseconds and the result was consistent with previous studies.

CONCLUSION: The proposed protocol is capable of revealing the norm RT of people aged 6 to 60. FTS is a feasible and commercially-available device for potential use as a standard tool to measure simple and choice eye-hand RT.

TALENT DEVELOPMENT AND IMPORTANCE OF PHYSICAL FITNESS IN AUSTRIAN YOUTH GOLF ATHLETES

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UNIVERSITY OF INNSBRUCK

INTRODUCTION: Golf is a popular and rapidly growing sport. According to several studies, strength, power, flexibility and postural control have a positive influence on golf performance [1,2]. However, hardly any gender and age specific normative data in performance relevant fitness parameter are available which are needed for optimal training planning for youth athletes. Therefore, the aim of the present study was to evaluate the age and gender specific development in golf-specific physical performance tests in elite youth golf athletes and to generate normative data.

METHODS: In total, 133 elite youth golf athletes (82m, 51f) aged 15-20 years (17.3±1.6) were examined. The athletes were divided into three age categories: 15-16 years (27m, 18f), 17-18 years (34m, 20f) and 19-20 years (21m, 13f). The following parameters were included in the test battery: anthropometric characteristics, counter movement jump (CMJ), postural stability forward/backward (PSFB) and left/right (PSLR), agility run (AR), medicine ball rotational throw (MBRT), isometric core flexion (ICFS) and extension strength (ICES) as well as isometric core side flexion strength (ICSFS). Differences between age groups were calculated by using multivariate analyses of variance or Kruskal Wallis H-Tests, and gender specific differences (separated by age group) were assessed using independent t-Tests or Mann Whitney U-Tests. Additionally, for each athlete the best value was used to generate gender specific normative data for each age group.

RESULTS: Male athletes significantly differed in body height, weight, CMJ, AR and MBRT (p<0.05) between the age groups. A significant increase in anthropometric and fitness characteristics with increasing age is apparent. Female golf athletes of the three age groups significantly differed only in body weight, which increased continuously. Significant gender specific differences were found in each age group in the following parameters: body height, weight, CMJ, AR, MBRT, ICFS, ICES and ICSFS. Additionally, significant differences were found for the 17-18 year age group in body mass index and PSFB. Male athletes had higher values or performed better in all parameters. Based on mean values and standard deviations, gender specific normative data were generated for each age group.

CONCLUSION: The present study was the first study that provided age and gender specific normative data in golf-specific physical fitness parameters. Based on these data, the development of adequate conditioning training programs is possible in the future. Additionally, the