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EUROPEAN COLLEGE OF SPORT SCIENCE

26th - 29th June 2013, Barcelona – Spain

BOOK OF ABSTRACTS

Edited by:
Balagué, N., Torrents, C., Vilanova, A., Cadefau, J., Tarragó, R., Tsolakidis, E.

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Welcome

Dear congress participant,

Since its creation one of the main aims of the ECSS has been to contribute to the unification of sport science. However, the tremendous growth in the field has produced further fragmentation. Is it possible to unify these fragmented areas? Are there common principles that bind them?

Reductionism has dominated research for over a century and has provided a wealth of knowledge, yet it is increasingly clear that a discrete biological function can only rarely be attributed to an individual molecule. Indeed, most biological characteristics arise from complex interactions: between proteins, cells, organisms, groups, societies, etc. A key challenge in the twenty-first century is therefore to understand the structure and dynamics of these complex interactions, as this will surely foster a new and better understanding between the different scientific disciplines.

The 2013 ECSS Congress in Barcelona seeks to help sport science make its own leap forward towards a comprehension of ourselves not as part of a technical world but as interacting parts of a consistent and coherent whole: nature. The 18thAnnual Congress of the ECSS aims to contribute to the development of global approaches in the different specialized areas and to provide an even broader view of sport science. Hopefully, by moving from the whole to the parts and vice versa, sport scientists will be able to find the best paths through the field.

Barcelona is an open city: open to the sea, to culture, to the world and to science. What better place in which to join forces in unifying sport science.

Benvinguts a Barcelona,

Bienvenidos a Barcelona,

Welcome to Barcelona!

Natàlia Balagué & Carlota Torrents

Congress Presidents

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* Clinical track

competence (SPORT), perceived bodily attractiveness (BODY), perceived physical strength (STRENGTH), perceived level of physical conditioning (CONDITION). Boys (n=11, 9.0 + 0.9 yr) and girls (n=13, 9.3+ 0.7 yr) were randomly assigned by sex into control (CON, n=12) or experimental (EXP, n=12) groups. After a familiarization session with the child-sized resistance training equipment, the EXP received 12-wk of resistance exercise 2 d/wk. Training sessions were 45 min and consisted of 5-min warm up followed by 2 sets x 15 repetitions of 7 exercises performed at a 3:0:2 tempo concluding with 5-min cool down. Child to instructor ratio was 4:1. Post-testing of PSPP-C for CON and EXP occurred in wk12 after completion of the exercise program. A 2 x 2 repeated measures analyses of variance (ANOVA) was used to analyze PSPP-C. Bonferroni pairwise post hoc analyses examined differences in the subscales of the PSPP-C. Alpha level was set at $p<0.05$. Results There was no difference ($p>0.05$) between CON and EXP pretests of PSPP-C. A significant interaction ($p=0.37$) existed between CON and EXP groups. Post hoc analyses showed significant gains ($p<0.05$) for EXP in all 6 subscales from pre to post. Only the SPORT subscale improved for the CON group ($p=0.02$). Discussion Children who participate in a 12-wk resistance exercise program display enhanced physical self-perception compared to a control group. The CON and EXP began the program with similar PSPP levels. Regular resistance exercise improved all 6 subscale scores, not just STRENGTH, in the EXP. Children who participate in regular resistance exercise may have an increased awareness of their own levels of physical conditioning and strength. References Annesi, JJ, et al. (2005). Res Q Exerc Sport 76(4), 468-476. Velez, A, et al. (2010). J Strength Cond Res 24(4), 1065-1073.

DEVELOPMENTAL PATHWAYS OF FITNESS, AND NOT BASELINE, PREDICT FITNESS STATUS AT THE END OF CHILDHOOD.

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Introduction It is generally described that children fitness levels increase along childhood. Complementary to this idea is the notion that the tracking of children's fitness is good to moderate during this developmental time, and that baseline (initial values) of fitness are determinant on fitness development. The importance of developmental pathways has been recently reinforced by a theoretical argument that predicts that healthy lifestyle trajectories will evolve through either a positive or negative spiral of engagement or disengagement, respectively, in various physical activity behaviors across childhood that are reciprocally linked to motor skill, perceived competence and fitness development (Stodden et al., 2008). The main goal of this study is to test the hypothesis that different developmental pathways of physical fitness do occur during childhood (6-to-9 years-old), and to test their correlation with baseline fitness status. Methods This longitudinal study design included 507 primary school children who were assessed annually for four years on seven physical fitness tests. Childhood individual trajectories (baseline and slope values) on each of the fitness tests were determined along the four years of the study. Participants were divided into three groups according to individual fitness trajectories over time: Slow Rate of Change (Slow RC Change), Average Rate of Change (Average RC), and High Rate of Change (High RC). An ANOVA 3x2 (Group x Sex) with Bonferroni post hoc tests was used to test for the differences on rate of change between the constituted groups, and sex. Correlations between slope and test values were used to analyze the possibility of fitness performance prediction along the four years of the study. Results Results showed (1)significant differences on the rate of change between all groups ($p<.001$) for all variables tested (Slow RC < Average RC< High RC); (2) no effect from sex differentiation ($p>.15$ for all cases);and no positive correlation between baseline values and final values on physical fitness. Discussion The fact that differential pathways of fitness development were found throughout childhood adds to the established knowledge, and can be used as fundament for children's fitness programs. The level of fitness, even if not satisfactory early in childhood, can be changed, and it is the pathway, not the baseline, that shows to be of major importance for children to achieve a fit state. In conclusion, children show different rates of change in fitness development over childhood; and having a positive developmental trajectory of fitness predicts a fitter state at the end of childhood, independent of the initial values at 6-years-of-age. References Stodden, D. F., Goodway, J. D., Langendorfer, S. J., Roberton, M. A., Rudisill, M. E., Garcia, C., et al. (2008). A developmental perspective on the role of motor skill competence in physical activity: an emergent relationship. Quest, 60, 290-306.

ADIPOSITY INDICATORS IN YOUTH FROM A LOW SOCIOECONOMIC REGION

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Introduction BMI has been often used as an adiposity indicator in population-based studies (GONZALEZ et al. 2010). However, studies with children and women recommended that BMI should be used in conjunction with other estimates of body composition (i.e. skinfolds) in order to maximize the adiposity estimation in children. (WILSON et al. 2011) Purpose To analyze the power of different skinfolds to predict adiposity in youth with low socioeconomic status. Methods We measured body mass (BM), body mass index (BMI), waist circumference (WC), body fat (FAT) and skinfold at subescapular (SB), suprailiac (SI), middle axilary (MA), abdominal (ABD), biceps (BI), triceps (TRI) and middle calf (MC) regions in 232 youth aged 10-15 living in a low socioeconomic status island in Brazil. In addition, we calculated trunk adiposity (TrkA: SB + SI + MA + ABD divided by four), peripheral adiposity (PA: BI + TRI + MC divided by three) and total adiposity (TA: SB + SI + MA + ABD + BI + TRI + MC divided by seven). Results All skinfolds were subjected to principal component analysis (PCA). That revealed only abdominal skinfold with an eigenvalue exceeding 1, which explained 87% of the variance. This variance has increased by 95% when we added the next two components, i.e., supra-iliac and middle axillary skinfolds. The second PCA was constituted by TrkA, TA, PA, BMI, WC, BM and FAT, but it was explained only by TrkA (77% of the variance). Discussion Skinfold thickness is cheap and more direct measure of adiposity in children than BMI (OLDS, 2009). Our results recommend abdominal, supra-iliac and middle axillary, as well as trunk adiposity (i.e., mean of subescapular, suprailiac, middle axilary, abdominal) as the best body adiposity indicators in boys and girls from a low-socioeconomic region. References Gonzalez AM, Hartge P, Cerhan JR, Flint AJ, Hannan L, MacInnis Rj, et al. (2010) New England Journal Medicine, 363, 23, 2211-2219 Wilson HJ, Dickinson F, Griffiths PL, Azcorra H, Bogin B, Varela-Silva MI. (2011) American Journal of Human Biology, 23, 6, 780-789 Olds TS. (2009) European Journal of Clinical Nutrition, 63, 8, 934-9346 #supported by FAPESP process number 2010/20749-8