

Impressions of the 28th Annual Meeting of the European College of Sport Science in Paris

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The European College of Sports Science chose Paris as the venue for a successful blend of city experiences, networking, and recent research. The presentations were marred by the almost exclusive use of statistical significance to deal with sampling uncertainty. This report summarizes the plenary sessions: development of [sports champions](#), [fatigue](#), and [tendinopathy](#). This year only the handful of Wow-worthy symposia and original-research presentations are summarized: [machine learning](#) for dummies; [changes in the retina](#) with concussion; [training of arousal state](#) via pupil size; [ketone supplementation impairs](#) endurance; [gene tests for injury susceptibility](#) are premature; and [high-intensity interval training](#) works well for elite athletes.

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Paris, the City of Light, was the host city for this year's ECSS annual conference, the 28th since its inception. On the eve of the conference, Paris was also the city of lightning, as thunderstorms added a magical touch (and caused some flight diversions). Almost everyone took advantage of short breaks to visit the Arc de Triomphe and the Champs-Élysées, both within walking distance of the conference center. Many also escaped the city's hustle and bustle at the Bois de Boulogne, a vast park nearby.

In a break with tradition due to high prices, the congress hotel was located on the outskirts of Paris, too far away to walk to the conference. Doctoral students received complimentary public transport tickets. The venue provided smooth transitions between sessions and a comfortable air-conditioned environment amidst the heat-wave originating from North Africa. Safety regulations prohibited standing in the lecture rooms and halls, so there was disappointment for some potential attendees of some podium presentations. The poster sessions attracted high attendance, which caused a congested noisy environment. Presenting a poster is often part of the first experience of an international conference for young researchers, so the poster sessions should be better organized in future. The opening and closing ceremonies were influenced by the upcoming Olympic and Paralympic Games of Paris 2024, with incredible breakdance performances,

an acrobatic display featuring remarkable skills with a crutch, and captivating dance shows. Despite ongoing unrest following the fatal shooting of a teenager by the police, congress attendees were fortunate to enjoy leisurely walks in the evening along the illuminated Seine, visit the sparkling Eiffel Tower at night, and engage in networking and discussions with colleagues at bars and bistros.

We extend our congratulations and gratitude to the organizers, including the local congress president Gaël Guilhem, the conference committee, and ECSS president Jørn Wulff Helge and his dedicated team, including all the helpful and friendly volunteers. Thanks are due also to the president-elect, Alexander Ferrauti, for taking on some of the duties of president, as Jørn was unable to attend.

The congress featured three plenary sessions (six presentations), 32 invited sessions (96 presentations), 168 oral sessions (760 presentations), 120 poster sessions (1046 presentations), 403 e-poster presentations, six masterclasses, and six special interest meetings and satellite symposia. ECSS provided us with counts of attendees by country and by research area: France had the highest number (499), followed by Japan (362), and the UK (307); there were relatively few attendees from China (125) and USA (74). Most registrants were in the general field of physiology & sports medicine (1993), followed

by biomechanics & neuromuscular (816), and social sciences & humanities (546). More than half the registrants were students, highlighting the importance of this conference for career development.

Applications for the young investigator award were the highest yet (657), and 116 competed for the best podium and best poster presentations. Follow [this link](#) to the list of the winners.

In another break with tradition, this report features summaries only of the handful of presentations worthy of a **Wow!**, in the opinion of the co-author (HPW) who attended the conference and saw the presentation, or in the opinion of the co-author (WGH) who stayed at home and skim-read the book of abstracts. Although we tried to widen the focus this year, everything we summarized turned out to be relevant only to competitive athletes, possibly because we aren't up with interesting or controversial issues relevant to activity and health in other populations. We were expecting something on combining resistance and/or endurance exercise with the latest weight-loss drugs for obesity, but there was no such abstract.

To find the abstract of a presentation we have reviewed, copy the presenter's name and initials shown in brackets [...] into the [search engine](#). The [book of abstracts](#) can also be downloaded; search it in Acrobat using advanced search (Ctrl-Shift-F). You can also link to presentation abstracts via the [scientific program](#) at the [conference site](#).

Unfortunately, there was no break in the tradition of authors' inability to turn away from the nil-hypothesis significance test when dealing with sampling uncertainty in the magnitude of effects. The book of abstracts featured 3785 occurrences of *significant* or *non-significant* and 3476 occurrences of *p* values, whereas *Bayesian* in an inferential context occurred only 17 times, *uncertainty* only five times, and *MBI* and *MBD* only once each. Evidently there has been little effect so far of the *Frontiers* [article](#) published last year on replacing statistical significance and non-significance with better approaches to sampling uncertainty. There was some evidence of the awareness of the importance of magnitude, in that *Cohen's d* and *d=* occurred 59 and 125 times, but authors should be wary about using this method of standardization in clinical or practical settings. For more on effect magnitudes, see the slideshow in the article on [linear models and effect magnitudes](#). For details on magnitudes

that matter to athletes, follow the links in the first paragraph beneath the abstract of that article.

None of the plenary sessions was particularly controversial, and none reached the Wow! threshold. However, their summaries of the state of the art were interesting enough to report here.

Youth performance is a poor predictor of later success, so the **development of sports champions** is a matter of engaging in multiple sports for enjoyment rather than early specialization with the deliberate practice promoted by Ericsson for the 10,000 hours promoted by Gladwell, according to the presenters of this plenary session. [MACNAMARA, B.; HARRISON, C.] But let's not forget that some athletes have reached the top with an Ericsson-Gladwell trajectory.

The two presenters of the plenary on **fatigue** kept our attention by alternating at the podium throughout the hour. Their key points: acute and chronic fatigue are hard to define, and training should be tailored to athletes' strengths, weaknesses, and current level of fatigue. [MILLET, G.; PATTYN, N.]

The plenary on **tendinopathy** was also presented with frequent alternations at the podium. We were told about the turnover of collagen in healthy tendons, the changes in injured tendons, the severe impact of tendinopathy in sport, the higher risk for top-performing athletes, and the importance of mechanical loading for prevention and recovery. It's still not known why some injured tendons heal while others become persistently abnormal. [BAHR, R.; KJAER, M.]

Wow! The most exciting of the symposia was "**Machine Learning** for Dummies," in which the presenter shared his personal journey of learning to write apps for acquiring data without prior experience, using the free artificial-intelligence software CreateML. He encouraged everyone to explore app development when they have an idea, and he highlighted the great support he received from ChatGPT. [BALSALOBRE-FERNÁNDEZ, C.]

Wow! Five professional French **rugby players** who had experienced at least one **concussion** in a prospective one-season study showed higher retinal neuronal loss compared to 31 players without concussions. Additionally, all players, regardless of concussion history, exhibited reductions in retinal nerve fiber layer thickness, ganglion cell layer thickness, and vascular density, while showing an increase in macular thickness over the season. The specific

mechanisms behind these changes in retinal structure remain unknown, but there is obvious potential here for assessing severity of concussion and monitoring recovery. [BONNIN, S]

Wow! In another potential methodological breakthrough, a controlled trial with 54+28 **healthy volunteers** showed that "changes in pupil size can be volitionally induced via **pupil-based feedback training** and are linked to changes in autonomic nervous system functioning, as indexed by heart-rate variability... This finding has potential for mental training in the sports domain, by enabling athletes to control their arousal state." [WEIJS, M.L.]

Wow! Forget about acute **ketone supplementation** for endurance performance: it impaired 20-min time-trial mean power by 2.4% (95% confidence interval 0.6 to 4.1%) compared with placebo in a crossover with 22 **trained cyclists**. [MCCARTHY, D.G.]

Wow! "Based on current evidence it remains

premature to market any commercial **genetic test** to determine susceptibility to **musculoskeletal injuries**," but several polymorphisms merit further investigation for Achilles-tendon and rotator-cuff injuries. [COLLINS, M.]

Effects of **high-intensity interval training** on performance of **elite athletes** had not been characterized adequately until this meta-analysis [WIESINGER, H.P.]. Considering such athletes are already highly trained, it's surely a **Wow!** that enhancements ranged from 2.1% for 5-s sprints in male team-sport athletes to 12.6% for anaerobic-threshold power in female endurance athletes. Effects on VO₂max were greater than those on time-trial mean power, probably because of antagonistic effects on exercise economy and/or fractional utilization. [HALLER, N.]

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