Reflective Practice for Athletes, Coaches and Sport Scientists at the 2012 Pre-Olympic Sport Conference

Will G Hopkins[1], Sian V Allen[1,2], Rita M Malcata[1,2]

Sportscience 16, 26-31, 2012 (sportsci.org/2012/ICSEMIS.htm)

1 Sport Performance Research Institute New Zealand, Millennium Campus, AUT University, Auckland NZ; Email.
2 High Performance Sport New Zealand, Millennium Campus, AUT University, Auckland NZ.
Reviewer: Patria A Hume, Sport Performance Research Institute New Zealand, AUT University, Auckland, NZ.

Conference logistics marred this quadrennial conference on science, education and medicine in sport held in Glasgow before the London Olympics. Young researchers had the benefit of a science café providing career tips and other valuable advice. Presentations relevant to athletic performance also made the conference worthwhile, including: generic skills and reflective practice for sport scientists; reflective practice at a soccer academy; deliberate practice for soccer players; deliberate and reflective practice in Gaelic footballers; talent development of a top soccer player; core training for swimmers; the flow experience for golfers and team-sport athletes; failure of light treatment for jet-lag in soccer; punches in boxing; imagery training in futsal; bioneural feedback in elite athletes; EEG patterns in archers; caffeine for physical impairment from cognitive fatigue; application of biomechanics to giant slalom, swimming and cricket; sport science in rugby sevens, badminton, curling, hockey and swimming; race-pace warm-up for middle-distance runners; individualizing altitude exposure; challenges in research on effective coaching; skills of a top basketball player; fast-tracking elite athletes. KEYWORDS: competition, elite athletes, ergogenic aids, nutrition, performance, talent identification, tests, training.

Reprint pdf · Reprint docx

The quadrennial pre-Olympic conference, this year held in Glasgow prior to the London Olympics, has the immemorable acronym ICSEMIS (pronounced *iks-miss*), standing for the International Convention on Science, Education and Medicine in Sport. The omission of *Olympic* from the title began with the 2008 conference and is obviously but mysteriously deliberate. Is *Olympic* too exclusive and elitist? Certainly the speakers at the opening ceremony at the Glasgow venue and keynote overplayed the *legacy* of the Olympics for population physical activity and health. The best of these speakers was Princess Anne, who spoke effortlessly, with humility and humor. Thereafter the conference was memorable more for the poor logistics (critiqued at the end of this report), but a science café for young researchers and presentations relevant to athletic performance (the focus of this report) made the conference worthwhile for sport scientists. Networking with other researchers and research students amongst the 3000 registrants in all the disciplines of exercise and sports medicine and science was also useful.

Impressions of Two Young Researchers
by Sian and Rita

The organizers can be commended for introducing a series of development workshops housed within a science café and directed towards early-career researchers. The sessions included an opportunity to meet the experts on sports science and nutrition strategies for elite sports performance (Ken van Someren, Ron Maughan), advice on how to network (Walter Thompson), and strategies for developing international research collaborations (Greg Whyte). The workshop we attended on planning a career pathway in science in sport (Jo Doust) was a dynamic affair, encouraging interaction and discussion between attendees. Aside from providing a refreshing respite from the impersonal and generally uninspiring atmosphere of this large congress, we came away with several top tips for securing the job of our dreams: build a "Web identity" to advertise yourself, develop a strong teaching/working philosophy that you can clearly articulate in interviews

(always ask yourself beforehand "what will I add to the organization?"), and find a good mentor to guide your career development.

Performance Presentations

reviewed by Will, Sian and Rita

PDFs of **abstracts** are available at the conference website for the podium and poster presentations. Find the abstracts referred to below by putting the first author's name and initial shown in brackets […] into the advanced search form. Only three posters had originality and applicability to athletic performance sufficient to include in this report. In a re-run of this year's ECSS conference, none of the eight young-investigator awards went to a study of athletic performance, although one dealt with performance of "healthy participants".

Two of the most valuable sessions we attended were on the topic of the development of the **generic skills** of the **sport scientists** who provide service on behalf of the English Institute of Sport. The sessions were chaired by Sarah Rowell and delivered by her, psychologist Tim Kyndt and sport-science manager Ken van Someren. [Rowell, S will get both sessions.] These three have introduced a broad program of work placements, sponsored studentships, professional-development workshops and mentoring to fast-track the development of generic or non-technical people skills, which they and the sports consider to be as important for their sport scientists as the discipline-specific technical skills of assessment and evaluation.

The presentation format was novel and engaging: Sarah introduced each topic, Tim gave a mini-lecture on it, then Ken provided an interactive commentary. At times their presentation was an overwhelming litany of buzzwords from business psychology. **Reflective practice** got its first of many airings at this conference. It refers to communicating with everyone, including yourself, about everything in your work (or in your training and competing) before, during and after you do it. Other concepts that came up here were *self-awareness, values, insight, foresight, motivation, communication, consultancy, trust, leadership, mentoring, problem-solving, decision-making, managing team dynamics, dealing with conflict, influencing and inspiring others*… In question time Will contributed *honesty*, and in writing this report and further reflecting on his own experience of successful sport scientists, *conscientiousness* in all its forms–including always going the extra mile–wins over the coaches and other experts. It goes without saying that you still have to be good at what you're going the extra mile with, your technical stuff. Will suspects that just continuing to tell budding practitioners that all these things are important accelerates them along the right path, provided of course that you practice what you preach–that you have *integrity*, in other words. The EIS team identified two areas for their own further development: class-room simulation of real-world service-delivery situations, and improving the mentoring skills of the more experienced sport scientists.

Reflective practice was the legacy of a visit by sport psychologist Zoe Knowles of Liverpool John Moores University to a "leadership academy" for elite female **soccer** players aged 10-14 in–where else?–California. The girls do such things as identifying and interviewing leaders in their community and taking part in mentoring programs with academy captains to find answers to such questions as "what type of leader/enforcer am I?" And they play good soccer, too! Seriously, it appears to be a very successful program. [Rhodius, A]

The psychologist who qualitatively interviewed two "uber-elite" (cream-of-the-cream) **soccer** players identified the following 10 components of cognitive **deliberate practice**: discussion, inquisition, study, evaluation, use of technology, visualization, modeling, cognitive restructuring, social support, and elite mental attitudes. "This type of practice should be given serious consideration by governing bodies, directors of sport, managers and coaches." [Horrocks, D]

Unfortunately none of us attended the presentation of a case study of **talent development** presented by the coach of England's top **soccer** player of 2011 in his early years (age 9-16). According to the abstract there were significant talent development coaching issues, including a drastic relative age effect and conflicts within the academy coaching process [Holt, J]

The authors reported the effect of a randomized controlled trial of the addition of **core-training** exercises to the training programs of 15 female and 15 male **swimmers** as a likely trivial change of -0.17 s in 50-m time, but by our calculations the effect is -0.7%, with confidence limits of -2.1 to 0.7%. The thresholds for small and moderate effects on swim time are

about 0.25% and 0.75%, estimated by multiplying the 0.8% typical variation a top swimmer shows between competitions (Pyne et al., 2004) by 0.3 and 0.9 (Hopkins et al., 2009). It follows that the effect here is moderate but unclear. Be that as it may, give this kind of program serious consideration. [Hibbs, A; poster]

Flow in sport is another label for the performance of an emergent expert skill referred to in the report on the ECSS conference last year: perceptible to the athlete or coach but probably beyond reach of reductionist biomechanical analysis. A young investigator interviewed 12 European Tour **golfers** (10 in the abstract) for insights into this "elusive and unpredictable" phenomenon. His abstract refers only to "a novel model of flow, providing a tentative explanation of flow states", but he presented two models explaining the state in the eight golfers who experienced it: *making it happen* (where goals heightened focus, leading to the experience), and *letting it happen* (where performance itself was the factor). [Swann, C]

Ten female and two male athletes and coaches were interviewed for an hour each for insights into the **flow** experience in **team-sport athletes**. The authors concluded that team flow includes most of the dimensions of individual flow and several new team-specific dimensions. [Mozek, E; poster]

Bright light is supposed to affect circadian rhythm, but bright light at a time of day predicted to accelerate adjustment to a 5-h eastward time-zone shift had little effect on reducing **jet-lag** symptoms in a randomized controlled trial of 22 elite female **soccer** players. [Thompson, A]

Winners in **boxing** matches made more attacks (not significant and not presented in the abstract, but probably clear) and more **punches** per attack in 84 boxing performances across a range of levels and weight categories. [Thomson, E]

"**Imagery** is the central pillar of applied sport psychology" according to Tony Morris, and he proceeded to deliver a great study of "self-modeling", in which five elite male players of **futsal** (a sport like soccer) participated in an uncontrolled time-series study. There were four 4-week phases in ABAB sequence; each A and B phase included four competitions, where A were monitoring phases, during which players were videoed, and B were intervention phases, during which selected clips of various skills performed successfully in A were viewed at least once a day by players on iPod Touch devices. "Analysis of individual graphs revealed improvement in performance of all four targeted skills and increased self-efficacy for all participants after the intervention phases." Cool! [Azizuddin Khan, T; presented by Tony Morris.]

The presenter declared the support of the makers of the Thought Technology equipment she used in a series of case studies of the effects of **"bioneural" feedback** in the preparation of 15 **elite athletes**. The "bio" refers to respiration, heart rate, muscle tension (EMG), skin conductance and peripheral body temperature, while the "neural" refers to recording of the EEG. She was convinced these contributed to the "key psychological skills" of focus, anxiety management and recovery by facilitating learning of self-regulation. Well, probably, but it would be good to see evidence from time-series data or controlled trials. [Werthner, P]

Measurement of the **EEG patterns** in **archers** resulted in the inconclusive finding that "the patterns vary as a function of skill level, but not simply as a function of score." [Casey, M]

In a crossover with 12 healthy "**participants**", time to exhaustion (~12 min in a constant-power test) fell by 20% following a 90-min cognitive test, but when the subjects consumed **caffeine** blind, performance time increased by 24% yet fell by only 3% following the cognitive test. Divide these effects by ~12 to get their equivalent on mean power in time trials (Hopkins et al., 2001; Vandenbogaerde and Hopkins, 2011). Conclusion: caffeine attenuates the physically fatiguing effect of mental fatigue, although the title mistakenly proclaims that caffeine *mediates* the effect. [Staiano, W; poster]

Three representatives of the World Commission of Science and Sport gave convincing accounts of the valuable contribution of science, particularly **biomechanics**, to elite performance in **giant slalom** (Erich Müller), **swimming** (Kari Keskinen), and **cricket** (Richard Stretch). The abstract [see Müller, E] doesn't convey any of the information that was presented, so here's one example from each presenter: development of skiing-specific training ergometers based on painstaking quantification of kinematics and kinetics on the snow; a

case study of the successful change in the style of a 100-m butterfly swimmer (coincidentally a study presented at the 2010 BMS conference *and* here *again*); and important changes in batting technique when cricketers face a bowling machine instead of a bowler.

A similar symposium with a focus more on specific examples of the **delivery of sport science** was presented by Malcolm Fairweather and Alison Alcock of the Sport Scotland Institute of Sport, with their associate Ross Sanders of the University of Edinburgh. Malcolm and Alison framed their examples around skill acquisition/retention (assessed by appropriate testing) and skill transfer (to competitive performance). By training speed-endurance of **rugby sevens** players, they increased the proportion of successful line breaks from 52% to 86% in one year. They reduced a top **badminton** player's unforced errors from 25% to 8% in six months, partly by training her with a better player and focusing on the corner where she made most errors. Timing in **curling** is crucial, but they found that a top player was being misled by external timing, which turned out to have twice the error of the athlete's own perception. The Scottish success rate with the **hockey** drag-flick shot was only 10%, but they increased it to the world-class rate of ~35% by applying principles of deliberate practice, contextual interference and systematic periodization. Ross spoke more generically about balancing service and research in **swimming**, in which each athlete is a case study involving the coach and all the support specialists. Effects of asymmetry on swimming performance is a major novel project still in progress. [Fairweather, M]

Innovations in **sports science** south of the Scottish border were the focus of a symposium given by Ken van Someren and Steve Ingham of the English Institute of Sport. The abstract [Ingham, S] is of the results-will-be-presented variety and does not include the following two recent projects on performance enhancement presented by Steve. In a crossover with 11 elite middle-distance **runners**, Steve and colleagues improved 800-m time-trial performance by 1.0% with a priming **warm-up** containing a continuous race-pace 200-m run (see journal abstract). EIS physiologists have also been measuring hemoglobin mass in an attempt to optimize individual responses to **altitude exposure**. They provoked increases in nearly all of 10 **elite athletes** and achieved a mean increase of ~1.5%. For a commentary on this series of possibly unpublishable case studies and details of other EIS-backed innovations, visit Steve's blog.

In a symposium on research on effective **coaching**, the first two speakers (Jean Coté and Paul Ford) spent most of their time explaining their theoretical frameworks for research on expert performance (Côté and Gilbert, 2009; Ford et al., 2009). The most important skill in coaching is apparently decision-making. The final speaker (Chris Cushion) provided evidence of the difficulty in changing coaches' behaviors. He also spoke of the need to raise coaches' self-awareness about what they do and why they do it, but in question time he admitted that there was still little evidence that greater self-awareness in the coach leads to better performance in the athlete. In response to another question he said that coach and player outcomes are difficult to measure in complex sports except through self-reports, the validity of which he had earlier questioned. [Search for *Sports Coaching Effectiveness* to find their three abstracts; Mark Williams is in the program but was unable to attend.]

The conference ended on a high with a symposium on the development of expert athletic performance focusing more on the athlete than the coach. It was introduced by Paul Ford, who took us through all the physical, psychomotor and context-specific tactical **skills** of a top **basketball** player. The skills are acquired through deliberate play in childhood, which gradually gets replaced by deliberate practice (he prefers deliberate *environments*) in adolescence and competition in adulthood.

Ed Coughlan then reported on his recent exciting PhD studies on the roles of **deliberate and reflective practice** in expert and intermediate Gaelic **footballers**. Experts chose to practice their weaker (non-dominant) kick while the intermediates chose their stronger (dominant) kick. The experts also engaged in more reflections about their practice at various times between training sessions, and they improved more than the intermediate players. Finally intermediate players assigned to an experimental group prompted to do reflective practice improved more than a matched control group.

The final speaker, Natalie Dunman, gave an equally exciting presentation of case studies of

some of the 18 **elite athletes** the UK Talent Team have **fast-tracked** to the London Olympics with far less than Ericsson's estimate of 10,000 hours of experience needed to make an expert musician. See a blog message about the program posted in November 2011 by Natalie, but skip the silly promo video. See also an item about Helen Glover, one of their athletes who has now won gold in London in rowing. It will be worth watching out for an evaluation of this program after the Olympics. [Search for *Expert Athletic Performance* to find the three abstracts; several speakers in the program were unable or chose not to attend.]

Conference Logistics

critiqued by Will

Disappointingly, the conference organizers did not put the **poster abstracts** on the conference website during the conference or on the flash drive in the conference registration pack. No explanation was given when I enquired. The poster abstracts were available for a limited time via the smartphone conference app, but they were listed in random order different from the unlabeled order of the displayed posters. The app itself was anything but a killer on the Android, and the author search form did not work, so the poster abstracts were effectively inaccessible. At the time of putting the finishing touches on this report in early August, an attendee alerted me to the fact that the poster abstracts had become available at the site.

I had volunteered to present a colleague's poster electronically, but I turned up to find no such facility for presentation. I am afraid I therefore contributed to the high proportion of poster **no-shows**, an incredible two-thirds! Were these people actually present at the meeting? If they were, the institutions who funded them presumably will never know that they didn't present. What can the organizers do to prevent this sort of thing happening next time? There was also an unprecedented rate of no-shows for the podium presentations, something like 20%. For the first time ever I witnessed no-shows of chairs. By the last day even the registrants weren't turning up: a valuable symposium on sport science in the preparation of elite athletes had a disappointing (but not disappointed) audience of 12.

Timetabling of the morning keynote lectures was poor: they were scheduled for only 45 minutes, and they ran straight on to invited symposia without a break. In the first keynote, the renowned geneticist Claude Bouchard went over time by 10 min (the fault of the chair and previous speaker), while speakers and audience for the next session queued noisily outside. Bouchard never made it to his following symposium at another lecture theatre some distance away, and neither did the chair or the other speakers, but someone got up and gave a talk that wasn't in the program!

At least two presenters we know of **self-plagiarized** by giving original-research talks they had already presented verbatim at previous international conferences: one by a student presenter at this year's ECSS conference two weeks previously, and the one referred to above by a more senior academic at the BMS conference in 2010. A colleague who was a coauthor of the student's abstract informed me that there was no statement at the ICSEMIS site about the work having to be original, so I guess the student and coauthors are acquitted on a technicality. I suggest organizers in future run abstracts through Turnitin. It's usual for big shots to give the same invited talks at conference after conference, but I had little respect for the speaker who gave the same talk practically verb-atim and visu-atim as a keynote on one day and at a symposium the next.

In general the chairs were good, but some moved talks forward to take up the slack of the many no-shows, and others kept inviting questions when the speaker's time was up. I wanted to scream "keep to the **scheduled program**!" That's what the instructions to chairs should have stated in a large font on page 1.

The **registration fee** of UKP399 did not buy lunches or even a biscuit with morning and afternoon coffee or tea. The conference dinner cost UKP40. My two students and I opted instead for salads, bread, berries and cherries from Marks and Spencer, for about UKP5 each. I heard from someone who went to the dinner that it was a stand-up affair with finger food that ran out early on. Incredible.

In summary I rated this conference C+, and others I spoke with were even less generous. It's an embarrassment for the chairs of the organizing and scientific committees (Celia Brackenridge and Greg Whyte), who must have been given the impossible mandate of maximizing profit and attendance without compromising quality. Nevertheless, young researchers got a

bad impression about the state of the science of exercise and sport from this meeting. Let me assure you: it's not like this at ECSS and ACSM annual meetings or at any number of speciality conferences organized at a fraction of the cost by their professional organizations. The IOC should have spent money more wisely to honor the hype of their website banner proclaiming "sport… inspiring a learning legacy".

I didn't go to the closing ceremony, but a colleague who did told me that the Brazilians put on a fabulous dance show to promote the conference before the 2016 Rio Olympics. Let's hope those running this next conference have learned something from the legacy of this one.

Acknowledgements: Teesside University, ECSS and High Performance Sport NZ and Will's consulting account all contributed to the authors' expenses for this conference tour, while AUT University provided Will's salary.

References

Côté J, Gilbert W (2009). An integrative definition of coaching effectiveness and expertise. International Journal of Sports Science and Coaching 4, 307-323

Ford P, Coughlan E, Williams M (2009). The expert-performance approach as a framework for understanding and enhancing coaching performance, expertise and learning. International Journal of Sports Science and Coaching 4, 451-463

Hopkins WG, Schabort EJ, Hawley JA (2001). Reliability of power in physical performance tests. Sports Medicine 31, 211-234

Hopkins WG, Marshall SW, Batterham AM, Hanin J (2009). Progressive statistics for studies in sports medicine and exercise science. Medicine and Science in Sports and Exercise 41, 3-12

Pyne D, Trewin C, Hopkins W (2004). Progression and variability of competitive performance of Olympic swimmers. Journal of Sports Sciences 22, 613-620

Vandenbogaerde TJ, Hopkins WG (2011). Effects of acute carbohydrate supplementation on endurance performance: a meta-analysis. Sports Medicine 41, 773-792

Published August 2012
©2012