Second Scientific Conference on
MOTOR SKILL ACQUISITION
15.-17.11.2017

“Methodologies to Enhance Sport Performance and Athlete Development: Integration of Research and Practice”

Program

Wednesday 15.11.2017

11.30 Exhibition Open
12.30 Opening Ceremony:
Principal of Kisakallio Sports Institute: Asko Härkönen
Dean of the Faculty of Sport and Health Sciences, University of Jyväskylä: Dr. Lasse Kannas
Director of the Research Institute for Olympic Sports: Dr. Sami Kalaja
12.45 Professor Keith Davids - Implications of Current Theorising on Skill Acquisition, Expertise and Talent Development for Practice Design in Elite and Developmental Sport
13.30 Professor Karl Newell - Constraints on the Acquisition of Movement Coordination
14.15 Professor Damian Farrow - The Value of Modification in Children’s Sport to Enhance Skill Development
15.00 Richard Shuttleworth - Designing Adaptive Training Games
16.15 Parallel Practical Sessions - Methodologies in Practice:
1. Morten Bråten - Basic Motor Skills Training
2. Martijn Nijhoff - Perception Training in Coaching
17.30 Dinner
18.30 Dr. Patrícia Coutinho - The Role of Unstructured Play and Practice in Skill Acquisition
20.00 Welcome Party

Thursday 16.11.2017

8.00 Exhibition Open
9.00 Parallel Sessions for Oral Presentations
11.00 Professor Damian Farrow - Developing Decision Making Skill - On and Off the Field
11.45 Lunch
12.45 Parallel Practical Sessions - Methodologies in Practice:
1. Richard Shuttleworth - Designing Adaptive Training Games
2. Morten Bråten - Basic Motor Skills Training
3. Mark O’Sullivan - Creating a Learning Space for Developing Decision Making
14.15 Dr. Kate Baker - Shifting the Paradigm for Skill Acquisition and Talent in Olympic Sports: A case study collaboration between GB Boxing and the English Institute of Sport
15.15 Closing Words - Professor Keith Davids
Kisakallio Sports Institute
ELITE CLASS TRAINING & EDUCATION CENTER

Kisakallio Sports Institute is a not-for-profit foundation, which offers a wide variety of sports, activities, educational possibilities and excellent facilities for professional and amateur sports enthusiasts. Kisakallio Sports Institute was founded in 1949 to be a Gymnastics institute for women of all ages.

Today Kisakallio Sports Institute is one of the biggest training and education centers in Finland and Europe with 700 beds and almost 15000 sqm of sport facilities.

This is the second in the series of conferences hosted together by Kisakallio, University of Jyväskylä and the Research Institute for Olympic Sports.
It brings together:

- TRAINING ENVIRONMENT
- TRANSFER EFFECT
- PRACTICAL IMPLEMENTATION
- CONSTRAINT MANIPULATION
- PERCEPTION AND DECISION MAKING SKILLS
- MOTIVATION

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Timo Jaakkola
Chair of Scientific Board

Sami Kalaja
Director, KIHU
ABSTRACT | In this talk I will elaborate on the perspective of Nikolai Bernstein (1967) that skill in movement tasks is, in effect, the mastery of the redundant degrees of freedom (DFs). The study of motor learning and performance has, however, been dominated by task demands to scale an already producible coordination mode - thus restricting the coordination of the joint space DFs in many laboratory motor learning tasks. The acquisition of new patterns of coordination in whole-body sport motor skills, in contrast, gives emphasis to the coordination and control of multiple joint DFs and the motion and stability of the torso in every activity. It remains a challenge in the theory and practice of movement science to understand the roles of the many DFs in the formation and acquisition of movement coordination, control and skill over the lifespan.

**Karl Newell**
Professor, Department of Kinesiology, College of Education, University of Georgia, USA

**Constraints on the Acquisition of Movement Coordination**

**ABSTRACT** | Some coaches describe it as the player who is a good driver in heavy traffic. The player who seemingly knows what to do and when. The coach who is able to pick up and utilise opportunities for action. The player who quickly and initiatively "does what is right, quickly and creatively" (italics in the original) Linked to Gibbons (1979) ideas of the integrated role of perception and action in quick-wittedly and initiatively. This implies for practice designs developing skill, expertise and talent in sport. The continuum proposes a landscape of opportunities for action (Rietveld & Kiverstein, 2014) in which coaches can support pick up and utilisation of affordances (opportunities for action) suggest how practice tasks can be structured in dynamic sports environments.

Based on these insights, an affordance landscape continuum (Davids et al., 2017) underpins the acquisition of skill, expertise and talent in sport. The continuum proposes a landscape of opportunities for action (Rietveld & Kiverstein, 2014) in which coaches can design narrow fields of affordances (purpose-designed for novices and beginners in sport) or more highly challenging practice task designs that enhance problem-solving, innovation and creativity, adaptability and 'dexterity' in elite and developing athletes. Traditionally, coaches working on skill acquisition tend to adopt a 'repetition without repetition' pattern that all learners need to reproduce. By default there is an ever-increasing influx of technologically driven off-field training approaches that purport to develop decision making. The rationale and supporting evidence for methods such as sport-specific computer driven simulations and non-sport specific vision training programs (i.e., 3D multiple object tracking) will be discussed.

**Keith Davids**
Professor of Motor Learning
Centre for Sports Engineering Research
Faculty of Health & Wellbeing
Sheffield Hallam University, UK

**Implications of Current Theorising on Skill Acquisition, Expertise and Talent Development for Practice Design in Elite and Developmental Sport**

**ABSTRACT** | Ecological dynamics proposes that athletes and sports teams can be conceptualised as complex adaptive systems. What does this imply for practice designs developing skill, expertise and talent in athletes? Key insights provided by theorists like Nikolai Bernstein (1967) and James J. Gibson (1979) imply that skill, expertise and talent in sport results in coordination of actions with events, objects, structures and other performers in dynamic performance environments. Enhanced organisation of system components in athletes and sports team is predicated on a tight coupling between perception and action systems so that goal-directed behaviour is fine-tuned and information-based during performance and practice.

Bernstein (1967, p228) drew attention to the relevant concept of dexterity: "the ability to find a motor solution for any external situation, that is, to adequately solve any emerging motor problem correctly (i.e., adequately and accurately), quickly (with respect to both decision making and achieving an accurate outcome), rationally (i.e., expeditiously and economically), and resourcefully (i.e., quick-wittedly and intentionally)" (italics in the original). Linked to Gibbons' (1979) ideas of the integrated role of perception and action in supporting pick up and utilisation of affordances (opportunities for action) suggest how practice tasks can be structured in dynamic sports environments.

Based on these insights, an affordance landscape continuum (Davids et al., 2017) underpins the acquisition of skill, expertise and talent in sport. The continuum proposes a landscape of opportunities for action (Rietveld & Kiverstein, 2014) in which coaches can design narrow fields of affordances (purpose-designed for novices and beginners in sport) or more highly challenging practice task designs that enhance problem-solving, innovation and creativity, adaptability and 'dexterity' in elite and developing athletes. Traditionally, coaches working on skill acquisition tend to adopt a 'reproductive' emphasis, involving an ideal template or 'classic' motor pattern that all learners need to reproduce. By default there is an over-emphasis on repetition, rehearsal and drilling of movements during practice. Using the affordance landscape can help coaches avoid too much repetition and rehearsal of specific movements and tactical patterns through over-use of drills and shadow play. Practice designs at the more variable end of an affordance landscape can be used to enhance athletic performance of elite and developing athletes by emphasising 'repetition without repetition' (Bernstein, 1967). Affordance fields can be designed for athletes to facilitate their capacity to explore, discover and exploit functional performance behaviours, rather than merely repeat the reproduction of a coach-imposed mechanical pattern (Davids et al., 2017).

**ABSTRACT 2 |** Some coaches describe it as the player who is a good driver in heavy traffic. The player who seemingly knows what is going to happen next, two passes before it happens. Good decision makers in team sports may not be the fastest around the court or field but their ability to accurately forecast a game’s future means they always seem to have all the time in the world. This presentation will review contemporary methods used to develop the decision making skills of athletes both on and off the field. The presentation will consider what we already know about the developmental experiences of expert decision makers and how knowledge of this history can inform coaching practice. A critique of on-field “game-based” training approaches will be conducted to detail the key principles that underpin the successful development of decision making. Finally, consideration will be given to the ever-increasing influx of technologically driven off-field training approaches that purport to develop decision making. The rationale and supporting evidence for methods such as sport-specific computer driven simulations and non-sport specific vision training programs (i.e., 3D multiple object tracking) will be discussed.

**Damian Farrow**
Professor of Skill Acquisition
Institute of Sport, Exercise and Active Living,
Victoria University and Australian Institute of Sport, Australia

**The Value of Modification in Children’s Sport to Enhance Skill Development**

**ABSTRACT |** National sporting organisations devote significant effort towards enhancing the education of their coaches. Typically such content is focused on developing the skills of the coach as it relates to instruction, feedback and session planning. Irrationally, very little attention is paid to educating the coaches about the learning value of modification. That is, the selective modification of key constraints such as the children’s sporting equipment and the playing conditions (i.e., area, rules etc.) to enhance skill development. This presentation will review recent research that has systematically considered the value of modifying key constraints in a children’s sport context particularly in the sports of tennis, basketball and cricket. It will be demonstrated that if the modification of the sports task is optimised, it can lead to age-appropriate tactical and skill development and secondary positive outcomes such as increased participation due to increased enjoyment (see Buszard, Reid, Masters, & Farrow, 2016 for a review).

**Developing Decision Making Skill – On and Off the Field**

**ABSTRACT 2 |** Some coaches describe it as the player who is a good driver in heavy traffic. The player who seemingly knows what is going to happen next, two passes before it happens. Good decision makers in team sports may not be the fastest around the court or field but their ability to accurately forecast a game’s future means they always seem to have all the time in the world. This presentation will review contemporary methods used to develop the decision making skills of athletes both on and off the field. The presentation will consider what we already know about the developmental experiences of expert decision makers and how knowledge of this history can inform coaching practice. A critique of on-field “game-based” training approaches will be conducted to detail the key principles that underpin the successful development of decision making. Finally, consideration will be given to the ever-increasing influx of technologically driven off-field training approaches that purport to develop decision making. The rationale and supporting evidence for methods such as sport-specific computer driven simulations and non-sport specific vision training programs (i.e., 3D multiple object tracking) will be discussed.

**Methodologies to Enhance Sport Performance and Athlete Development: Integration of Research and Practice**
Richard Shuttleworth
PhD, Skill Acquisition specialist, UK

Designing Adaptive Training Games

ABSTRACT | There is much research investigating the role of game training and the potential benefits it provides learners (Davids, Araújo, Correia, & Vilar. 2013). However, new research findings are emerging which suggest that current decision making training methods are being questioned by expert coaches and players as to their effectiveness in developing highly skilled and adaptable performers. Traditional training methods such as repetition, drilling, rehearsal and also the delivery of more games based approaches outrehearsal and also the delivery of more games based approaches as SSG’s, designer games and game sense are often implemented by coaches in ways to achieve predetermined processes and outcomes thereby artificially and often over constraining the performer-environment interaction. More recently, a constraints based and non-linear approach to coaching and learning has gained increasing support among researchers and practitioners in sport settings (Chow, Davids, Button, Shuttleworth, Renshaw & Araujo. 2006). A challenge for practitioners is how to adopt principles and concepts from ecological dynamics into their session planning, design and delivery along differing time scales. We highlight new research findings which support the need to reconsider the current use of traditionally run game based training in the development of skilled performers. From an ecological dynamics perspective we propose a conceptual framework which emphasises the importance of the adaptive training zone in shaping self-regulatory skill, involving the inter-action of performers along a spectrum of preplanned-action and re-action in a complex adaptive system. We provide some recent examples in sport with coaching interventions which embrace key ecological principles in the task-performer-environment dynamic. A practical workshop will follow to demonstrate more simplicistically some of the concepts described in the talk.

Maarten Vansteenkiste
Professor, Department of Developmental, Personal and Social Psychology, Ghent University, Belgium

About Mustivation and Wantivation: The Critical Role of a Needs-based Motivating Style

ABSTRACT | Coaches face the challenge of motivating their athletes such that they get the best out themselves, are persistent, and perform well. According to Self-Determination Theory (Ryan & Deci, 2017; Vansteenkiste & Ryan, 2013), a broad theory on human motivation, sport coaches do well to nurture athletes’ psychological needs for autonomy (i.e., experiencing a sense of volition and ownership), competence (i.e., experiencing a sense of effective-ness) and relatedness (i.e., experiencing a sense of connection) if they want to promote their enduring motivation and well-being. If coaches manage to adopt a need-supportive styles, their athletes more willingly put effort in their sports and are cooperative because they want to (i.e., “mustivation”). Recent research is discussed which suggests that coaches’ motivating style can be best described along a circumplex, which distinguishes different need-supportive and need-thwarting subareas. While a participative, attuning, guiding and clarifying approach relates to greater need satisfaction and engagement, a demanding, domineering, abandoning and awaiting approach comes with a cost. In addition, experimental and inter-vention studies are reviewed that speak to issue of positive and corrective feedback, choice, an inviting communication style and the question whether coaches can be successfully trained in this motivating approach. It is concluded that coaches can be successfully trained, to the benefit of themselves and their athletes.

Patricia Coutinho
PhD, Faculty of Sport, University of Porto, Portugal

The Role of Unstructured Play and Practice in Skill Acquisition

ABSTRACT | The developmental activities that athletes engage in during childhood and adolescence are considered one of the most important factors in skill acquisition and talent development (Coutinho, Mesquita & Fonseca, 2016; Forsman et al, 2016). Within the panoply of early developmental sport activities that constitute the athlete’s sport participation, unstructured activities have been given some recognition as an important learning experience that could aid the development of skill and expertise (Coutinho et al, 2016; Forsman et al, 2016). Unstructured activities include informal activities, regulated and monitored by children, and developed in various play environments (e.g. parks, playgrounds, beaches, backyards or street games) (Coutinho et al, 2016; Côte et al, 2013). These activities are not systematically or pedagogically planned and are characterized by their intrinsic values of fun, enjoyment, challenge and skill development (Coutinho et al, 2016; Côte et al, 2013; Côte & Erickson, 2015). Their high degree of novelty and variability creates opportunities for children to adapt to novel physical, social and emotional contexts, also allowing them to explore their independence and emotions and enhance their organization and leadership skills (Côte et al, 2013; Côte & Erickson, 2015). Furthermore, flexibility in the structure and form of games provide children with the freedom to invent, adapt, and negotiate rules (and other characteristics), which promote the development of important characteristics of expertise in sport, such as innovation, creativity, adaptability, and flexibility (Côte et al, 2013; Coutinho et al, 2016; Davids, Araújo, Seifert, & Orth, 2015; Memmert, Baker, & Bertsch, 2010). Bernstein (1967) proposed that such features form a hallmark of skilled behaviour, which he termed dexterity. In this presentation we argue that unstructured activities have an important role to play in the development of skill and expertise in sport. These activities need careful definition and theoretical rationalisation to understand their precise value to developing talent. The characteristics of unstructured sport activities and how they could aid the development of skill and expertise in sport will be discussed. More specifically, we will explore how unstructured sport activities could contribute to an athlete’s motor, physical, cognitive, psychological and social development.
Martijn Nijhoff

Motor learning and control teacher,
University of Eindhoven, Netherlands

Perception Training in Coaching

ABSTRACT | Since 2012 the Dutch Baseball Federation is testing its youth and pro baseball players on Gaze strategy. This is being done with a mobile eyetracker from Senso Motoric Instruments (SMI).

The data are being used to distinguish the difference between Elite Baseball Hitters en novice. The outcome of these data analyses gives the Dutch Baseball Talent Program a clear direction in how to utilize this knowledge on a daily baseball training setting.

During the lecture we will provide you with the outcome of this research and the practical implication for the Baseball trainers in the Netherlands.

Marije Elferink-Gemser

PhD, Center for Human Movement Sciences, University Medical Center Groningen and University of Groningen, Netherlands

The Development of Talented Athletes Towards Expertise

ABSTRACT | Elite athletes’ performances are astonishing, leaving millions of people wonder how it is possible that they do what they do. With apparent ease, grace, and fluidity elite athletes carry out seemingly impossible maneuvers. They constantly push the boundaries of human performance and we, the ones standing on the sideline, are fascinated by it.

If we look under the surface of elite sport, we know that every elite athlete was once a child and has gone a long way before reaching the top. What characterized their successful development towards expertise? One way to gain insight into this intriguing question is to simply ask current elite athletes to retrospectively report what they have done. They probably tell you that they have dedicated most of their time, energy, resources, and effort with the goal of becoming the best they can be. Still, this leaves us with the question of how to identify and develop those youth athletes who have the potential to become outstanding when they are older. The prediction of long-term success is extremely difficult and the later successful athletes are not necessarily the ones who performed best in youth competitions. The reason for this is that many factors play a role: factors related to both the athlete (i.e., rate of learning, training and maturation of anthropometric, physiological, technical, tactical, and psychological skills) and the environment (i.e., opportunities created by parents, trainers, coaches, talent development program, and the competition structure) along with a component of chance.

In the last decade, over one thousand talent identified athletes in a variety of sports, among which are soccer players, field hockey players, basketball players, volleyball players, artistic gymnasts, tennis players, and speed skaters, have been followed in the Groningen talent studies. These studies revealed that to reach expertise, athletes have their own unique development patterns. In the presentation, a selection of these patterns will be shown.

Still, future successful athletes also have much in common, i.e., their capability to derive more from the same number of practice hours than less successful athletes, and, as a consequence, they are better able to constantly improve their performance. They are known to take responsibility for the progress they make and score higher on aspects of self-regulation of learning, such as reflection and effort. Although self-regulation may be considered as a general characteristic of an athlete, which can be applied across domains, the mechanism itself is highly context-specific. In the presentation, this mechanism of self-regulation of learning and its value for reaching expertise will be explained as well as how trainers and coaches can use this information in their training sessions.

Chris Harwood

Professor of Sport Psychology School of Sport, Exercise and Health Sciences, Loughborough University, UK

The Practice of Applying Motivational Principles to Optimise Athlete Development and Performance

ABSTRACT | The aim of this presentation will be to provide a scientist-practitioner’s perspective of the key psychological themes, factors and services that are important to consider with respect to achieving both performance enhancement and personal development outcomes in young athletes. Drawing from applied research in contemporary theories of achievement motivation (Nicholls, 1984; Roberts & Treasure, 2012) and personal consulting experiences in youth sport (Harwood, 2008), I will reinforce the vitality of a holistic approach to athlete development that informs the fundamental roles of coaches, parents, players/athletes (peers) and support staff in creating motivationally-rich environments for children and adolescents. Key tools for coaches and parents to help optimise and regulate achievement goals in young athletes will be presented as such work is fundamental to enabling young athletes to process inevitable success and failure. The capacity and readiness for an athlete to consistently draw a sense of achievement from personal improvement, learning and ongoing growth is viewed as pivotal for sustaining athletic involvement. In addition, recent psychosocial interventions and strategies that draw from the 5C’s framework (Harwood, 2008; Harwood & Anderson, 2015; Harwood. Barker & Anderson, 2015) will offer insights into how coaches can motivate young athletes to focus on their psychological development in a user-friendly, socially-enriched manner. The influence of peers in a team context and motivational principles that affect group dynamics will be appraised in conjunction with practical techniques to optimise team cohesion.
Mark O’Sullivan

UEFA A Level Coach

Creating a Learning Space: Theory Informing Practice and Practice Informing Theory - As Many as Possible as Long as Possible in the Best Possible Environment

ABSTRACT | Sports coaching research “needs to extend its physical and intellectual boundaries” (Potrac et al., 2007, p.34). There is a limited amount of research undertaken in the integration of theory in the sport sciences & knowledge from the perspective of high quality applied practice in sport. The integration of experiential knowldege of coaches with theoretically driven empirical knowledge represents a promising avenue to drive future applied science research and pedagogical practice (Greenwood, Davids, & Renshaw, 2013).

A major factor that influences all performers (at all levels) throughout their sporting careers is the quality of coaching environment (Martindale et al., 2005, p.353). Despite the research literature on athlete development being generally more humanistic and developmentally orientated (e.g. Côté & Lidor, 2013a) there is a continuing emergence of non-flexible programmes promoting early talent identification and specialisation often characterised by selection and deselection through all ages and stages (Güllich, A., 2013) with a clear absence of critical thinking. Structured performance pathways are now common place across the world, with many countries investing heavily into the identification and development of talent (Rothwell, et al, 2017). These environments are often characterised by linear technique focussed direct instruction of athletes (Light, Harvey & Mouchet, 2012) with an inordinate emphasis on repetition of the wrong type and practice designs that ignore the detection and use of contextual information, which is the basis of skill adaption in team games (Araújo, et al, 2006; Araújo & Davids, 2011). Environments like these often exclude individuals based on rates of development and does not take into account the complexity and non-linearity of human development. For example; sub-systems of the human body develop at different levels and may act as rate limiters on performance (e.g., psychological (Collins & MacNamara, 2012), and social development (Deci & Ryan, 2000); muscular system (Thelen & Clark, 1996).

However, there is increasing acceptance that individual differences among learners need to be accounted for when coaches plan teaching interventions in any learning contexts (Chow & Atencio, 2012). A key challenge for coaches is to cater for this abundance of individual characteristics during practice. Therefore, non-linear pedagogy (grounded in the constraints-led approach) is particularly appealing in that it underpins a learner centred approach and the emergence of skills (Renshaw, 2012) and provides an appropriate framework for practitioners to cater for individual complexities and dynamic learning environments (Lee, M. C., Chow, J. Y., Komar, J., Tan, C. W., & Button, C, 2014). The concept of football interactions applied in a nonlinear pedagogy can challenge coaching cultures that separate the player –environment system that has found its way in to the fabric of organised child sport and give us an understanding as to how we can design learning environments in youth football.

Coaches who are willing to share their evidence-based practice will improve the quality of practical and applied work in sport. We need to recognise that we probably do not know as much as we think and there is a need to facilitate a space for exchange and learning in a community of practitioners and researchers in a meaningful way in order to develop understanding and knowledge and propose improvements for the constructive transformation and evolution of both the coaching environment (practice and coach education) and the literature.

Morten Bråten

Head of technical and motor developmental skills at Norwegian Olympic training Center.

Basic Motor Skills Training

ABSTRACT | The main philosophical reflection: How can we best transfer physical skills into development of technical skills in order to increase efficiency and performance?

This is a specific approach developed through Basic Motor Skill Training, with the main goal of finding the optimal sports specific techniques to improve performance.

The physical part of Motor skill training is all about mobility and stability. Coordination- and cognitive competence is essential when you work with transfer strategies.

The success of transferring skills lies in the athletes’ Knowledge and reflection of different contexts in the training processes. The interdisciplinary cooperation is of great importance, especially in training processes that requires a progression in power and strength.

To achieve sub-goals, such as functional joints chains with no limits, will be important in the long-term developing process. We like to think that this specific training also has an injury-prevention effect.

Key points for practical approach:
1. Communication
2. Visualization
3. Inner dialogue
4. Emotion-/thought processes

The interactivity with coaches/trainers is essential for the results of transferring, and the dialog is the most important tool during the process.

By experience, we can see the importance of developing an athlete’s ownership and responsibility of their own developing process during this training process.

Basic Motor Skill Training is a part of the holistic development of an athlete; in sports where a holistic approach is necessary to succeed.
**Keith Lohse**  
Assistant Professor, Department of Health, Kinesiology and Recreation, University of Utah, USA

**Cognitive and Affective Determinants of Motor Skill Learning: An Applied Neuroscientific Model**

**ABSTRACT**  Considerable research has been devoted to understanding how practice should be structured to enhance the long-term retention and transfer of motor skills. Various researchers have conceptualized these effects in terms of information processing, dynamical systems, or social-psychological theories. In the current model, we focus on neuroscientific evidence to explain how common cognitive variables (e.g., feedback, instructions, and demonstrations) and affective variables (e.g., engagement, curiosity, challenge) influence motor learning and performance separately. A key consideration of this model is the importance of distinguishing between performance (in the short term) and learning (in the long term), as factors that are good for performance may often not be beneficial for learning. Although the basis of the model is neuroscientific, the talk is focused on implications for coaches and practitioners. Specifically, we will focus on (1) exploring the movement space and the value of making errors, (2) increasing motivation during practice to improve long-term learning, and (3) creating optimal levels of challenge during practice to increase engagement.

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**Kate Baker**  
PhD, Lead Performance Pathways Scientist  
English Institute of Sport

**Shifting the Paradigm for Skill Acquisition and Talent in Olympic Sports: A case study collaboration between GB Boxing and the English Institute of Sport**

**ABSTRACT**  In spring 2016, the English Institute of Sport and GB Boxing embarked upon a project to collaboratively address the development of future GB boxers across the UK, through the creation of a Development Framework for Coaches, Boxers and support staff working throughout the Performance Pathway. Through a thorough re-examination of the vision and purpose of the pathway, the EIS Performance Pathways Team worked in partnership with GB Boxing to create a holistic Framework in which the content is expanded to include the Boxer as a Person, as well as an Athlete. This approach offers a significant departure from traditional approaches to Boxer development, and the challenges in exploring this evolution will be discussed. In creating a Development Framework, the ‘what’ and ‘why’ of skill development are inherently examined for the Boxing context; however, the utmost importance is placed around the ‘how’. The project has the greatest implications for practice design and the alignment of pedagogical principles utilised both in clubs and National Performance Centres over the longer term. Dr Kate Baker, EIS Performance Pathways Team, and Tom Stanton, GB Boxing, will talk through the journey so far and the challenges of realigning praxis with skill acquisition principles to enable more adaptable boxers inside, and outside, the ring.

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**Tuomas Kari**  
PhD, Faculty of Information Technology, University of Jyväskylä, Finland

**Is it Possible to Increase Motor Skills and Exercise Motivation by Exergames?**

**ABSTRACT**  Exergames are digital games combining physical activity and games. Exergames require physical effort from the player in order to play the game, and the physical effort determines the outcome of the game (Kari, 2017). This presentation contemplates the possibilities of exergames to increase motor skills and exercise motivation.

Research has shown that exergaming can have positive effects on physical activity levels, but the evidence regarding long-term benefits is lacking (Kari, 2014). For example, Pokémon GO has increased the physical activity levels of its players (e.g. Atthoff et al., 2016, Kari et al., 2017), but the large-scale sustainability remains a question. Hoda et al. (2013) found that exergames can help transform boring exercises into entertaining ones, which subsequently increases the player’s motivation to continue exercising. Trout and Christie (2007) have suggested that exergames could promote the motivation towards other forms of physical activity and may therefore act as a gateway or an incentive for a more active lifestyle. Although exergames are equally adopted between people with different physical activity backgrounds (Kari, 2015), it is likely that the motivational effect varies between them. Naturally, exergames’ ability to increase motivation varies between individuals, but on a general level, it seems to be larger among those who are otherwise less interested in exercising and more interested in games.

Regarding motor skills, the findings are controversial. Vernadakis et al. (2015) found in their own intervention study that exergames can be utilised to foster and retain the development of fundamental motor skills (FMS) in children and suggested that implementing exergaming into their daily activities would likely assist children in achieving recommended levels of FMS. However, their literature review shows that the results and conclusions have varied between different studies. Barnett et al. (2015), for example, concluded that while exergaming may help introduce children to sport, spending 1 h/week for 6 weeks is unlikely to build object control skills of typically developing children. Howie et al. (2017) suggest that the (in)effectiveness may depend on the play quality. Barnett et al. (2014) studied children’s and their parents’ perceptions regarding exergaming and motor skill development and found that while children could articulate limitations of exergames for skill learning, they still reported extensive use of exergames as a learning tool for movement skill, and considered that skill acquisition was highly transferable to reality. Their parents’ perceptions were less optimistic. Thus, I suggest that it is not a matter of yes or no. It is evident that some exergames work for some people in increasing certain motor skills or exercise motivation, but the effect depends both on the game and the player. Therefore, the essential thing behind successful and effective implementation is to know your target group and choose/design the game to suit their needs and desires.
ORAL PRESENTATIONS

PARALLEL SESSION 1
Ball Hall
Chair: MSc Mikko Huhtiniemi, University of Jyväskylä, Finland

Time: 09:00 – 09:15
Andrew Miller, Stephen Harvey, Roland Nemes, Narelle Etherer, David Morley
DEVELOPING JUNIOR SPORTS COMPETEN-CY USING PLAYING FORM ACTIVITY: OUTCOMES OF A RANDOMIZED CON-TROLLED TRIAL

Time: 09:15 – 09:30
Ana Ramos, Patricia Coutinho, Isabel Mesquita, Pedro Silva, Keith Davids
WHY LEARNING CAN BE OPTIMIZED BY THE COMBINATION OF TGFU AND CLA? A LON-GITUDINAL ACTION RESEARCH AP-PROACH IN A YOUTH VOLLEYBALL TEAM

Time: 09:30 – 09:45
Ming-Yang Cheng, Dirk Koester, Thomas Schack
ENHANCING GOLF PUTTING PERFOR-MANCE BY NEUROFEEDBACK TRAINING

Time: 09:45 – 10:00
Carolin Braun, Pátrik Rau, Thorsten Stein
EFFECTS OF A BILATERAL FOOTBALL PRACTICE ON THE PERFORMANCE DEVELOP-MENT OF FOURTH GRADER IN PHYSICAL EDUCATION

Time: 10:00 – 10:15
Stephen Hadlow, Derek Panchuk, David Mann, Marc Portus, Bruce Abernethy
GUIDELINES FOR DESIGNING AND IMPLEMENTING EFFECTIVE MODIFIED PERCEP-TUAL TRAINING IN SPORT: A META-ANAL-YSIS

Time: 10:15 – 10:30
Michael Maloney, Damian Farrow, Ian Renshaw
AN EXAMINATION OF TRAINING DESIGN IN AN ELITE COMBAT SPORTS PROGRAMME

Time: 10:30 – 10:45
Carolin Braun, Ilka Seidel, Thorsten Stein
EFFECTIVENESS OF AUGMENTED FEED-BACK AND OBSERVATIONAL LEARNING IN THE LEARNING OF THROWING IN LA-CROSSE IN PHYSICAL EDUCATION

PARALLEL SESSION 2
Auditorium
Chair: MSc Mei Teng Woo, University of Jyväskylä, Finland

Time: 09:00 – 09:15
Chris Pocock, Neil E. Bezodis, Keith Davids, Jamie S. North
EXPERIENTIAL KNOWLEDGE OF ELITE RUGBY UNION PLAYERS ON KEY PERFOR-MANCE CONSTRAINTS IN PLACE KICKING

Time: 09:15 – 09:30
Paul Venner, Bart Hanegraaff, Nicola Theis
EFFECTS OF VARIABLE LOCAL FATIGUE AND POTENTIATION WITHIN A CON-STRANTS-LED APPROACH ON SKILL DEVELOPMENT IN ELITE YOUTH BASEBALL HITTING

Time: 09:30 – 09:45
Josefine Panter
DECEPTION IN SPORT: A SYSTEMATIC REVIEW ON KINEMATIC DECEPTIVE ACTION IN SPORT

Time: 09:45 – 10:00
Jan-Erik Romar, Markus Ranta-Aho
THE COACH AND THE TEACHERS OF EPS and POTENTIATION WITHIN A CON-STRANTS-LED APPROACH ON SKILL DEVELOPMENT IN ELITE YOUTH BASEBALL HITTING

Time: 10:00 – 10:15
Mihkel Laas, Mark Wijnbergen, Iain Spears, Guy Parker, Matt Portas
USING MOTION CAPTURE TO ASSESS JUMPING PERFORMANCE VARIABILITY IN YOUNG FEMALE SOCCER PLAYERS

Time: 10:15 – 10:30
Hosni Hasan, Keith Davids, Chow Jia Yi, Graham Kerr
DOES WEARING TEXTURED AND COM-PRESSION MATERIALS ENHANCE SOMA-TOSENSORY SYSTEM REGULATION OF AC-TION WHEN CONTROLLING A FOOTBALL?

Time: 10:30 – 10:45
Ying Hwa Kee, Jia Yi Chow, Lung Hung Chen
AUTONOMY-SUPPORT DURING DIFFEREN-TIAL LEARNING: POSSIBLY COUNTER-POR-DUCTIVE

PARALLEL SESSION 3
Conference room Kunto
Chair: MSc Sanni Seppälä, University of Jyväskylä, Finland

Time: 09:00 – 09:15
Ted Kroeten
SPORT SAMPLING WITHIN PRACTICE TYPES

Time: 09:15 – 09:30
Alexandra Roberts, Daniel Greenwood, Clare Humberstone, Fiona Iredale, Annette Raynor
HOW DO COACHES IDENTIFY TALENT? AN EXAMINATION OF INTERNATIONAL COACH PERSPECTIVES IN COMBAT SPORTS

Time: 09:30 – 09:45
Martyn Rothwell, Keith Davids, Joseph Stone
FORMS OF LIFE, AFFORDANCES, AND ATHLETE PERFORMANCE

Time: 09:45 – 10:00
Daniel Newcombe

Time: 10:00 – 10:15
Joseph Stone, Anna Fitzpatrick
EFFECTS OF AN 8-WEEK CON-STRANTS-BASED COACHING INTERVEN-TION ON EMERGENT BEHAVIOUR IN MINI TENNIS

Time: 10:15 – 10:30
Christophe Schnitzler, Morgan Alberty, Michel Sidney, Keith Davids
KEY VARIABLES UNDERPINNING MO-TOR ADAPTATIONS AT DIFFERENT SKILL LEVELS: TOWARD A TEACHING STRATEGY FOR COACHES AND EDUCATORS IN FRONT CRAWL

POSTERS

Mirror Hall (Peilisali)

Michaela Bruton, Rebecca Dowse, Josh Secomb, Roger Adams, Gordon Waddington, Sophia Kompipsis
TUNING TO THE WAVE: ACTIVE MOVEMENT EXTENT DISCRIMINATION AT THE ANKLE IN ELITE AND SUB-ELITE SURFERS

Marja Kokkonen, Koon Tcek Koh, Wai Cheong Eugene Chew
THE USE OF REFLECTION-CARD IN ELITE YOUTH INDIVIDUAL AND TEAM SPORTS: OBJECTIVE AND SUBJECTIVE EFFECTS ON PERFORMANCE AND PERCEPTIONS OF US-AGE-RELATED FACTORS

Benjamin Franks, Daniel Newcombe, Will Roberts
A PERCEPTUAL APPROACH TO THE TRANS-FER OF SKILL: QUIET EYE AS AN INSIGHT INTO PERCEPTION-ACTION COUPLING IN ELITE FOOTBALL GOALKEEPERS

Sanni Antonen, Roy Hellgren
THE EFFECT OF IMPLICIT MOTOR LEARNING ON IMPROVING AND RETAINING THE SKILL UNDER PRESSURE WITHIN EXPERT TRAIN-EES

Saidi Zerrouki Youssouf
THE EFFECTS AND DIFFERENCES BETWEEN THE COACH AND THE TEACHERS OF EPS IN THE USE OF DEMONSTRATION STYLE (GLOBAL-PARTIAL) DURING MOTOR LEARN-ING OF COMPLEXES AND SIMPLE SKILLS

Scott Peterson, Michaela Bruton, Grant Dutthie, Doug Kors, John Crawley
A PRELIMINARY REPRESENTATIVE ANALYSIS OF ELITE GOALKEEPING PERFORMANCE

Ömer Faruk Akgül, Sinan Bozkurt
DIFFERENTIAL AND TRADITIONAL-LEARN-ING TRAININGS ON CHILDREN’S FOOTBALL DEVELOPMENT

Ville Kallinen, Kaisu Mononen, Minna Blomqvist, Niilo Konttinen
FUNDAMENTAL MOVEMENTS SKILLS AND ACHIEVEMENT GOAL ORIEN-ATIONS IN 10-YEAR-OLD FINNISH CHILDREN

Timo Laakso, Bruno Travassos, Jarmo Liukkonen, Keith Davids
FIELD LOCATION AND PLAYER ROLES AS CONSTRAINTS ON EMERGENT 1-VS-1 INTERPERSONAL PATTERNS OF PLAY IN FOOTBALL

Chia, J.S., Chow, J.V., Barrett, L.A., Burns, S.F
COFFEE, ACCURACY AND QUIET EYE IN BADMINTON SERVE