


MOVEMENT

JOURNAL OF PHYSICAL EDUCATION & SPORT SCIENCES

Book of Abstracts

The 5th International Congress of Exercise and Sport Sciences
The Academic College at Wingate

In Collaboration with The University of Nicosia, Cyprus, and The Olympic Committee of Israel

June 7-10, 2018

Edited by: Sima Zach and Devora Hellerstein

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Devora Hellerstein and Sima Zach

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A Message from the Editors

Dear Readers,

This special issue of *Betnua (Movement): Journal of Physical Education and Sport Sciences* is a publication of the Book of Abstracts from the 2018 International Congress of Exercise and Sport Sciences (ICESS) – The Academic College at Wingate, marking 70 years to the State of Israel and 10 years to the first ICESS at the Academic College at Wingate. This 5th ICESS was organized in conjunction with The University of Nicosia and The Olympic Committee of Israel.

The collection of abstracts presented in this issue is related to the following sub-themes within the umbrella topic of "Sport and Exercise Sciences": Sports Management, Sport Psychology, Physical Education and Sport Pedagogy, Motor Learning, Gender Issues in Sport, Sports Sociology, Sports History, Exercise Physiology, Sports Biomechanics, Genetic Aspects of Sport, Exercise Nutrition, Physical Activity and Sports in the Lifecycle, Olympic Education, Coaching Developments, Competitive Sport, and Sports and Technology.

This issue is comprised of 165 abstracts by scholars and professionals from 28 countries around the world. A rich program has been designed comprising nine keynote addresses delivered by the most notable authorities in their particular domain, setting the tone for a fascinating program which also includes oral presentations, poster presentations, symposia, workshops, and exhibits. We would like to sincerely thank all the authors who submitted abstracts, as well as those who attended and contributed to the conference program. We particularly wish to thank The University of Nicosia and The Olympic Committee of Israel for their significant support, contribution, and collaboration.

Yours Sincerely,

Prof. Sima Zach
Chair, Scientific Committee

Dr. Devora Hellerstein
Chair, Organizing Committee

Keynote Lectures

(Abstracts are presented in alphabetical order of the author's last name.)

Promoting Physical Literacy in Early Childhood: Evidence-Based Recommendations from SKIP

Jacqueline D. Goodway

The Ohio State University, Columbus, Ohio, USA

This presentation will take an early years physical literacy approach to promoting actual and perceived motor competence in young children from disadvantaged environments and elucidating the role motor competence plays in leading a physically active lifestyle and maintaining a healthy weight. Many vulnerable (poor, urban environments) children enter the early childhood years with significant delays in critical fundamental motor skills that are the prerequisites to later sports and physical activity. This is compounded by significant barriers (lack of built/home environment, access, minimum income, role models) in their communities to being physically active. In spite of these delays and barriers, such young children reveal positive perceptions of their motor competence, an asset that can be used in intervention. The 'Successful Kinesthetic Instruction for Preschoolers' (SKIP) motor skill intervention was developed to address these deficits and counter the negative developmental trajectories of these children. Situated in dynamic systems theory and Newell's constraints, the overarching purpose of SKIP is to promote actual and perceived motor competence, enhance motivations to be active, develop knowledge of their body's response to activity, and more recently, to promote physical literacy. In all SKIP interventions, we started by considering the child constraints, then manipulated environmental constraints to design high quality tasks aligned to a child's developmental level to positively influence actual and perceived motor competence and physical literacy. Within this presentation, I will chart the evolution of SKIP reporting data from a number of studies and highlighting lessons learned along the way. I will start with the expert-led direct-instructional approaches leading to more mastery-oriented, child-centered approaches to SKIP. From this work, we recognized the need for more translational research. Thus, I will summarize our most recent work where we have collaborated with teachers to deliver T-SKIP/SKIP Cymru/INDO -SKIP and an integrated FMS-reading literacy (RaMMP) intervention to children across the world. I will conclude with implications for physical educators, future early intervention research, and the importance of promoting actual and perceived motor competence during this critical window of development.

Coaching Life Skills in Young Athletes

Daniel Gould

Michigan State University, East Lansing, Michigan, USA

From the time of the ancient Greeks sport has been viewed as a mechanism for developing young people psychologically and preparing them for adult life. This holds true today as leadership, teamwork, confidence and resiliency are common examples of the types of life skills ascribed to youth sport participation. But does sport participation develop life skills? Coakley (2011) has argued that this is not the case and he contends that the belief that life skills are developed via sport participation is actually based more on myth than fact. What does the research say? And, if sport does develop life skills, when and under what conditions does this occur? This presentation examines the research on using sport to promote life skills in children and youth. Life skills are defined as 'those internal personal assets, characteristics and skills such as goal setting, emotional control, self-esteem, and hard work ethic that can be facilitated or developed in sport and are transferred for use in non-sport settings' (Gould & Carson, 2008). The sport psychological research on promoting life skills through sport is reviewed with an emphasis on factors influencing life skills development in young athletes. Research shows that life skills can be developed through sport and physical activity both implicitly and explicitly. Effects are not always positive. Most reviewers of the evidence, however, conclude that more consistent and positive results come when life skills are explicitly fostered and taught (Gould & Westfall, 2014). Life skills, then, are best viewed as being 'intentionally taught' versus as being 'caught' from mere sport participation. Example programs designed to promote life skills in children and youth through sport participation are discussed, as are theoretical explanations for how life skills are developed and influence young people. Finally, specific coaching strategies and policies that can be used to promote life skills in children and youth through sport are examined as well as strategies for insuring that life skills transfer from sport to other life contexts (Pierce et al., 2016). It is concluded that sport and physical activity contexts have great potential for fostering life skills. However, sport is not a panacea for the development of life skills. Life skills are most likely developed in young athletes when they are systematically fostered and taught by caring, competent adults who use both direct and indirect strategies for doing so.

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The Interplay of Sport Science and Sport Psychology

Dieter Hackfort

University AF Munich, Munich, Germany

The institutionalization of Sport Science and Sport Psychology is closely linked and the ongoing process of the disciplinary developments is very dynamic, influencing each other in various respects. Whereas in the German language we often speak about the 'mother-discipline', namely psychology, of sport psychology, in this contribution I would like to pick up the English word of 'parent discipline' of sport psychology, that is psychology and sport science, and focus on the interplay of Sport Science and Sport Psychology. This interplay is discussed in regard to (1) an appropriate theoretical framework enabling interdisciplinary communication and conjunction of concepts, (2) appropriate methodological approaches for the acquisition and coordination of information, and (3) appropriate strategies for cooperation in the application of knowledge and technologies.

By the example of fitness, the conceptualization, operationalization, and strategies for the enhancement of mental fitness is demonstrated. Initially, dimensions and factors as they are emphasized from various sport-science perspectives are identified and located in a theoretical context. In terms of mental fitness different facets are characterized and a multi-method approach for the operationalization is explained. To complete this part interventional strategies for the enhancement of mental fitness and general fitness will be discussed.

In conclusion, it is argued that interdisciplinary communication, coordination, and cooperation are essential for progress of insights in sport science, as well as in sport psychology and its transfer into practice. Potential complementarity of different disciplines or disciplinary perspectives and the necessity of a subordinated framework for their integration is highlighted and the concept of 'dosed complementary interdisciplinarity' is introduced.

Strategic Planning in Sport Organizations: Is It Possible to Implement?

Nicos Kartakoullis

University of Nicosia, Nicosia, Cyprus

Strategic Planning is widely used by organizations in different industries and it is the process of developing the mission, major objectives, strategies and policies that govern the allocation of resources to achieve organizational aims (Johnson & Scholes, 1999).

Although it is well documented that strategic planning (and the existence of a strategic plan) is a valuable tool that supports good governance in sports organizations for a number of reasons, many sports organizations do not actually have a strategic plan. Some of the major reasons for the absence of strategic planning are (1) time (2) getting started (3) broad expertise and (4) lack of trust and openness (Kriemadis & Kartakoullis, 2011). It is equally important to note that in the cases where there was a strategic plan in sport organizations, strategy control was not actually implemented. According to Cronje and Smit (2002) strategy control is a continuous process and is interwoven with planning, organizing and leading.

The purpose of this study is twofold: (a) to provide an analysis for the essence of strategic planning in sport organizations, and (b) to propose a model that could be utilized in convincing the decision makers in sport organizations to start working on the development of strategic plans for their organizations.

The primary source of data for this study has been ethnographic research that has been conducted by the author over the last two years (2016 – 2017) including interviewing individuals, high-ranked officials, in sport organizations in five different countries. Within the context of this ethnographic research, valuable data have been gathered on a number of 'sensitive issues' that are not easily discussed openly.

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Developing a Global Excellence Model and a Global Excellence Award for Sport Organizations

Thanos Kriemadis

University of Peloponnese, Peloponnese, Greece

There is a growing body of research work on the extent of Total Quality Management (TQM) and Excellence Awards (EA) and their impact on organizational effectiveness. A general finding is that TQM and EA are increasingly being adopted in the United States, in Asia, and in Europe. Most of the studies reviewed suggest that TQM and EA can add value to an organization's competitive strategy. The majority of the studies attribute a wide range of business performance improvements to the adoption of TQM and EA.

A United States study attempted to link TQM and EA and bottom-line results. The General Accounting Office (GAO) of the United States (1991) found that companies that adopted TQM practices experienced an overall improvement in corporate performance (higher productivity, better employee relations, greater customer satisfaction, increased market share, and improved profitability). GAO analyzed data in four key areas of corporate operations and found the following:

1. Employees in the companies GAO reviewed experienced increased job satisfaction and improved attendance; employee turnover also decreased.

2. Improved quality and lower cost were attained. Companies increased the reliability and on-time delivery of their product or service and reduced errors, and their cost of quality.

3. Greater customer satisfaction was accomplished. The data on customer satisfaction were based on the results of the customers' overall perception about a product or service, the number of complaints received, and customer retention rates.

4. Improved market share and profitability were attained. As measured by several ratios widely used in financial analysis, the impact of an organization's quality management system improved profitability.

The purpose of this presentation is twofold: (a) to provide an overview of the three international Excellence Awards and examine their relationship with organizational effectiveness (including financial indicators), and (b) to propose

a simplified **Global Excellence Model** accompanied by a **Global Excellence Certificate and Award** scheme for **sport organizations**. The presentation will include a detailed description of the evaluation process for a sport organization, the scoring system, the benefits, the levels of the Certificate and Award, and the options available to applicants.

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The Cultural Constitution of Athletes' Careers

Tatiana Ryba

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There is growing evidence within psychology that cultures and selves are mutually constituting. Development, therein, is conceptualized as a process of transformation through participation in cultural practices. Although increased interconnectivity of globalized high-performance sport functions to normalize certain experiences, identities, and ways of being, a closer examination of athletes' career trajectories reveals that the global practice of athlete development is similar yet unique when rooted in a specific place. Recent scholarship, aligned with cultural praxis sensibilities (Ryba et al., 2010; Stambulova & Ryba, 2013), has explicated the ways in which cultures at a particular historical conjuncture modulate the biological considerations that underpin the modernist logic of an athletic career. For example, making a comeback to elite sport after childbirth, as well as the age in which career termination occurs, now has a wider culturally acceptable vantage than previously. Moreover, with labor market instability among young people and the heightened requirements for both education and work-related practical competencies, adolescence has expanded to encompass what was previously considered young adulthood, presenting a 'new' challenge for youth athletes to construct a dual career in sport and education. Approaching career as a story about learning, paid and unpaid work, and relationships embedded in specific biographical and cultural events, I will first map a narrative-discursive content of elite sport from which youth athletes derive their meaning-making resources. Secondly, I will introduce my longitudinal study of adolescent athletes' dual career construction through elite sport high schools, situated within the Finnish version of the Holistic Athletic Career model (Ryba et al., 2016; Wylleman et al., 2013). Finally, I will share some of the project's novel findings that extend current understandings into how psychological and sociocultural processes intertwine in the construction of youth athletes' identities, motivations and orientations to the future.

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Toward a Model of Strategic Goal Setting in Sports

Zur Shapira

New York University, New York, New York, USA

Motivation and goal setting are two important elements in sport performance. Individual athletes as well as members of sport teams put a lot of effort in improving their performance. Two general goals are involved in such a process: first, improving absolute performance where an athlete in the long jump trains on her own to steadily become better. Second, in a situation of relative performance, usually in competitions, if there are several stages where say many runners compete to get to the final event, in each heat it suffices for the top runners to finish ahead of their competitors regardless of time. If an athlete competes in the high jump he can ask to set the bar much higher than what it was in a particular time. If he is successful in passing the high bar, his competitors are unlikely to beat him. However, such a decision entails risk as the athlete himself may not be able to pass the bar that he himself set. In competitive sports athletes have to take risks in different situations.

In this talk I will present a model that has been developed in my studies of managerial risk taking. The model assumes that athletes in competitions have two generic goals. One is a performance aspiration, and the other is survival, which in sport competitions means not to lose the game. Since competitions involve several steps, an athlete may succeed in some and fail in others. The main question is how much risk an athlete will take after a failed attempt (like in the high jump) or after a successful attempt, like being in the lead in the middle of a long jump competition. I will describe the model using data collected in other context such as in the Jeopardy! television game and will discuss potential implications for risky competition and strategic goal setting in sports.

The Role of Small-Sided Games as Both a Training Stimulus and a Talent Identification Model

Vish Unnithan

University of the West of Scotland, Hamilton, Scotland, UK

The preparation of soccer players for competition requires training to be viewed in an ergonomics context, whereby the training requirements are matched to the competitive demands of match-play (Kelly & Drust, 2009). Small-sided games (SSG) are modified games played on reduced pitch areas, often using adapted rules and involving small numbers of players than traditional soccer games (Hill-Haas et al. 2011). This approach is used as a useful way of training, because of the multiple benefits achieved; these games combine technical, tactical and physiological training (Unnithan et al. 2012).

Exercise intensity in SSG's has typically been assessed by heart rate (HR), and rating of perceived exertion (RPE), more recently global positioning systems (GPS) have all been utilized in monitoring exercise intensity. All of these methods have limitations and there is no clear methodology that is superior to the other, therefore, studies examining SSG protocols are best monitored via a combination of each of these measures (Hill-Haas et al., 2011). The exercise intensity of SSG's is demonstrated through a player's movements and physiological response to the stimulus. The prescriptive variables of the SSG can be manipulated by a coach to influence exercise intensity, these factors include pitch area, player number, training regime (continuous or interval), and rule modifications (Hill-Haas et al., 2011).

In SSG's, players experience similar situations to those they encounter in competitive matches (Aguiar et al., 2012). Consequently, SSG's are a popular method for developing specific physiological attributes for soccer players, as well as technical and tactical proficiency. A player's technical ability is the predominant component of successful soccer players, as it can consistently determine the difference between elite, sub-elite and non-elite players (Meylan et al., 2010). A competitive SSG format can provide a player with an environment whereby they have a greater number of ball contacts per individual than large-sided games (Owen et al., 2011). Small-sided games induce a higher amount of technical actions and provide a player with more opportunities to demonstrate their technical proficiency. Decision-making is an essential part of a competitive soccer performance, therefore training this aspect of a soccer player requires them to take part in drills that ensure there is a constant stream of opportunities to make decisions; SSG's encompasses this process (Roca, Williams & Ford, 2012). Accuracy and speed of decision is

cited as an important factor in determining the difference between high and low performance in players (McMorris et al., 1999). Small-sided games may be the device that can incorporate 'total' soccer performance as it is utilized in soccer training for this precise reason. Subsequently, work by both Unnithan et al. (2012) and Fenner et al. (2016) demonstrated the efficacy of SSG as a tool for talent identification in elite youth soccer players.

The Foundation and Development of the International Olympic Committee's Athletes' Commission

Stephan Wassong

German Sport University Cologne, Cologne, Germany

Athletes' Commissions have been established at National and International Sport Federations to stress the application of good governance policies. Research on the realization of this objective has to be expanded to critically evaluate the institutional recognition of the Athletes' Commission. The focus of this keynote delivery thus is on the IOC's Athletes' Commission (AC) which was founded in December 1981 at the IOC's Executive Board meeting in Sarajevo. The inaugural commission members included: Thomas Bach (FRG), Sebastian C (GBR), Ivar Formo (NOR), Kipchoge Keino (KEN), Svetla Otzetova (BUL), Vladislav Tretyak (USSR) and its chair, the Finnish IOC-Member Peter Tallberg.

Firstly, the process and discussions among sport officials that led to the decision to give athletes an official institutional representation within the IOC will be analyzed. The period under investigation spans from the Olympic Congress in Varna in 1973 up to the one in Baden-Baden in 1981. The research results to be presented are mainly based on an analysis of primary documents, including minutes of the Executive Board and the Tripartite Commission of the IOC, which was the main actor responsible for the organization of the named Olympic Congresses.

Secondly, it will be discussed how, why and when the IOC'S AC transformed from a president-appointed commission to a hybrid of appointed and elected members; this has certainly been an unusual process in the composition of IOC Commissions. Research on this will concentrate on the IOC's 2000 Reform Commission and its recommendations for the development of a more modern and sustainable profile of the Olympic Movement. Relevant sources for this include minutes of IOC-Sessions and secondary literature such as the edited book of Heather Dichter and Bruce Kidd (2012). Olympic Reform Ten Years Later (Routledge).

Oral Presentations

(Abstracts are in the order of the last name of the presenting author.)

The Core Is Not Just Abdominal and Back Muscles: The Role of the Diaphragm in Core Stability

Maya Abady

The Academic College at Wingate, Netanya, Israel

Trunk stabilization, also referred to as core stability (CS) has been defined as the internal platform of support of the trunk and limbs, against internal and external forces acting on the body. Core stability has been recognized as being a subset of 'Motor Control', however, the way it is being taught and applied by individuals is at times in conflict with motor learning and motor control principles. Early evidence supporting poor neuromuscular control patterns in the trunk muscles, transverse abdominis in particular, in low back pain subjects, were perhaps taken out of context in CS training, leading to the assumption that these are the key CS muscles needing attention for trunk stabilization, aiming at core strengthening rather than neuromuscular control and conditioning.

Evidence today addresses trunk stabilization together with postural trunk control, recognizing the role of general movement and intrinsic postural control, both needed for the stability of the key platform of support, the pelvis, as well as the trunk and limbs prior to any movement. The diaphragm is a key player linking between the trunk and the pelvis, contributing to their support and to the postural control mechanism, having an anatomical and biomechanical relationship with trunk stabilizers (abdominals, multifidi, pelvic floor), and a functional relationship contributing to and modifying the intra-abdominal pressure (IAP), another important element in trunk stabilization. This is in addition to its role in breathing and ventilation.

Adequate control of the diaphragm is a pre-requisite for initiation and coordination between the transverse abdominis, pelvic floor and multifidi muscles as main contributors to core stability. This is why optimizing breathing and diaphragm control is suggested as part of any treatment goals for posture, movement, muscle activation and core conditioning.

This presentation will examine the various relationships of the diaphragm with trunk stabilizers (anatomical, biomechanical and functional), and its role in the formation and adaptation of IAP for trunk stability, as the basis for movement and posture, considering it as perhaps the real 'Core'.

Meaningful Learning in Adapted Physical Activity (APA) to Improve Self-Determination, Empowerment and Autonomy for Four Women with Intellectual Disabilities: A Pilot Study

Joelle Almosni

The Academic College at Wingate, Netanya, Israel

Meaningful learning in APA implies the active involvement of students in whatever is learned. Meaningful learning occurs when students apply the knowledge they acquire, by going through distinct cognitive processes needed for successful problem solving. There is growing awareness in the fields of disability services, rehabilitation, and education, of the need to promote self-determination for individuals with Developmental and Intellectual Disabilities (ID), based at least partially on the importance of this outcome for people to experience an enhanced quality of life.

Self-determination is essential for people with ID to enable them to make their own decisions in their lives. Self-determination is based on autonomy and psychological empowerment.

Aim: The aim of the research was to conduct a pilot study regarding the impact of a special physical activity program based on personal choice to increas the sense of self-determination of four young women with ID living in a group home in the community.

Method: An intervention program based on making choices was proposed. A modified questionnaire based on the Self-Determination Questionnaire (Wehmeyer, 1995) was administered to each subject before commencement of the program (pretest), at the end (posttest) and three months after the end of the program. A second questionnaire on psychological empowerment was administered at three periods of time**.**

Results: A physical activity program based on personal choice had a positive effect on the participants in terms of self-determination and psychological empowerment.

Discussion and Conclusion: The findings of the pilot study demonstrated that self-determination can be enhanced in young adults with ID. It is recommended that more research be conducted in this important area with a much larger sample using mixed qualitative and quantitative methodology.

70 Years to Israel; 67 Years to the National Olympic Committee of Israel

Amichai Alperovich

The Academic College at Wingate, Netanya, Israel

The State of Israel marks its 70th anniversary this year, but the NOC of Israel will reach this mark only in three years – in 2021. The three lost years have influenced Israeli sport inside the country and its international relationships to this day. This presentation will focus on the reasons for the late establishment of the NOC and the outcomes of the IOC's recognition of Israel as an Olympic state in late 1951.

Two months prior to the independence of Israel in May 1948, Israeli sport stakeholders – conservative Maccabi and socialist Hapoel – agreed upon cooperation for one year in order to send a local delegation from Palestine to the 1948 London Olympic Games. This agreement was at those days a precedent, which would exist for many years and pave the path to problematic leadership among sport leaders and between them and the government of Israel.

The NOC of Palestine, composed by the Jewish Zionist Maccabi faction, ceased to exist from May 1948 and the IOC did not want to recognize a new NOC from the former Mandate state a few days before the Olympic Games. A sportive vacuum lasted in Israel for almost three years and several parties tried to fill it – Maccabi, Hapoel and the local government. Each one of the parties negotiated with the IOC to accept Israel to the Olympic family before the 1952 winter and summer Olympic Games.

On the one hand the IOC acknowledged it was a unique situation to deal with several parties from the same nation, and decided it was better to make an agreement with the Ministry of Foreign Affairs instead of the sport organizations, which then and also nowadays argue about the hierarchy and leadership of local sport. On the other hand, the IOC knew that the sport leadership and the NOC, which was established only after the intervention of the government, rely on the government.

Those three years shaped the relations between sport in Israel and the state leadership, as well as the connection between the NOC and the IOC placing Israeli sport in its unique spot locally and internationally.

The 1968 and 1992 Paralympic Games: A Comparison between Two Organizational Models in Different Historical Contexts

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In 1968 for the first time the Paralympics did not take place in the same city or country as the Olympics, since Mexico announced that it would not be able to host the Paralympic Games there due to technical difficulties. At the time, Israel, which had experience in the rehabilitation of disabled athletes, offered itself to host the Games in Tel Aviv. and connected this event with the 20th Anniversary of the establishment of the State of Israel. Twenty-four years later, the 1992 Paralympics was managed by the same organizing committee and in the same facilities of the Barcelona Olympic Games. It reinforced the city's urban regeneration in order to eliminate physical barriers which disabled people faced in their interactions with the built environment. This paper analyzes the economic and management features, as well as discusses the socio-economic impacts of both Games, so as to highlight their specific context. Nevertheless, little attention has been placed on topics about the circumstances of both Paralympic editions, a fact that reflects the reality that academic literature on the Paralympic Games is much less extensive than that which is available on the Olympic Games. This research proves, by a comparison of two different editions of the same sport mega-event, that the gap of 24 years between Tel Aviv'68 and Barcelona'92 was marked by a deep and holistic transformation and evolution of the Paralympic Movement.

Anthropometric and Physiological Characteristics of Elite Handball Players: The Influence of Playing Position

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[2]The Academic College at Wingate, Netanya, Israel

Background: Handball is a dynamic team game that combines movements that are explosive in nature. The aim of the current study was to evaluate anthropometrical characteristics and physiological attributes of elite handball players and to quantify differences, if any, according to player position.

Methods: The sample of subjects consisted of 35 handball players from the Israel Junior (U20) and national team (mean age 20.79±1.36yrs). All participants performed a battery of motor and physical tests reflecting handball physiological demands. The array of tests included anthropometric measures (height, body mass, %fat), countermovement jump (CMJ), 5m and 20m sprint, 3000m run, 1RM squat, 1RM bench press and LESS test. The results were compared based on playing position and to the Norwegian National Team and 1st division players.

Results: Wings players presented better performance abilities in the 5m and 20m sprint, CMJ and 3000m run compared to other player positions. Relative strength of the squat was better in the wings position compared to pivots, goalkeepers and backs. The same trend was presented in 1RM relative strength of the bench press, as wings performed better than other playing positions. When the results were compared to the Norwegian National Team and 1st division players, Israel's National Team athletes (U20) presented lower results and physical abilities across all playing positions.

Conclusions: The findings demonstrated the varying on-court demands and the different physiological characteristics reflecting each playing position. Physical training of handball players should therefore be individualized based on player position, current ability and the game's demands.

Etgarim – Challenges: Empowerment and Social Integration of People with Disabilities through Outdoor Sports

Avner Balkany

Etgarim, Tel Aviv, Israel

In Israel, there are around half a million people – children and adults – with physical disabilities, psychiatric disorders and other unique needs. Using outdoor sports activities to enhance educational and physical processes with children and adults started sometime in the mid-20th century. Etgarim started working with people with disabilities in 1995.

Etgarim, which means "challenges" in Hebrew, is a non-profit organization dedicated to the empowerment and social integration of people with disabilities through outdoor sports. The main goal of Etgarim, is to plant in each one of its members positive hope and to opens for them new and challenging opportunities.

The main purpose of the lecture is to describe and show the vast array of sports activities Etgarim offers, specifically adapted for empowerment and social integration, such as riding bikes, sailing, running and walking, climbing trees, climbing cliffs, kayaking, water skiing, diving, and hiking.

Etgarim's significant message to society is the ability to use the same process for people with different disabilities (physical or mental). By providing accessibility to riding bikes, climbing trees, sailing in the sea and different outdoor sports, we take people out of their comfort zone and into their growth zone. The process starts with the actual sport activity always added to the process that is transferred by our certified guides. Through that process, we empower people with disabilities to do more than they thought they could do. Hopefully, by understanding their potential in our activities, they will be able project these abilities to other areas of life.

Boosting Human Performance in Competitive Achievement Situations: Can We Indeed Learn from Sport Psychology?

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To boost human performance, the complex behavioral science of getting ahead has to be broken down to its determinants. We will discuss some of the most important psychological underpinnings of human behavior and how we can harness them to perform at our highest levels and succeed in sports and other organizational settings.

To excel in any competitive achievement situation, it is critical to develop psychological skills, which, like physical abilities, can be taught, learned, and practiced. Such individual skills include the regulation of arousal, motivation and goal setting, self-confidence, decision-making and creativity, whereas working in teams requires appropriate group-cohesion and effective leadership. These components of mental preparedness are mandatory and can be learned from sports psychology and applied to other settings, in order to better support, inspire and manage elite performers in general.

However, the assumption that scientific and applied knowledge that emerges in one domain can be used effectively in other domains, can be questioned. In a period of time when researchers from different fields have devoted efforts to increasing our understanding of how to establish optimal learning conditions/environments, practice arrangements, or training regimes that have the potential to enhance performance, one of the recommendations that is given to us is that practice/training should be task-specific. To attain better achievements, an individual should practice a given task consistently, repeatedly, and specifically. It would benefit him or her if this task-specific practice begins at an early age. Therefore, one can argue that the knowledge on how to improve human performance is domain-specific; that is, what is effective in one domain may not be so helpful in other domains.

The two positions described above are contrarian to some degree but while there are differences, they can be integrated as well. The general aspects of attention, motivation, goal setting and decision-making are needed for performance in competitive situations. But of course, task specific training is of utmost importance in such situations. However, tennis players for example,

imagine cognitively several aspects of a forthcoming game while not on the court. They can imagine a ball coming at a certain speed from a particular angle and think how they would respond to it. A goalie in soccer preparing for an 11-meter penalty kick can imagine different scenarios where the ball would be kicked, but he of course needs to practice different jumps in preparing for such kicks. He also has to lower his anxiety before a kick for which he can practice meditation and self-suggestion off the field.

Several examples will be presented from the way athletes prepare and train to how musicians, actors (and even firefighters) train, to highlight the dual aspects of performance in competitive situations.

You'll Never Walk Alone: Israeli Basketball Fans' Motivation and Team Identification

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Background: Research has addressed sports fans' motivation for supporting a team, and had attempted to forecast their behavior (Smith 1998; Wann & Branscombe 1993; Trail et. al., 2003). Such studies were conducted in the United States and Europe (Trail & James, 2001; Robinson & Trail, 2005). The present study aims to expand that knowledge to understanding Israeli sports fans, and Israeli basketball fans particularly, a field where knowledge is still limited.

Aims: This study aims to classify fans of teams in the Israeli Basketball League by team identification and fan motivation, and to reveal predictors for team identification. Another aim is to measure commercial behavior in relation to team identification and motivational factors, ultimately proving a better understanding and an updated overview of the relationship between basketball fans and their teams.

Method: Participants were 627 Israeli basketball fans who completed a survey. Measures included Motivation Scale for Sport Consumption (MSSC) (Trail & James, 2001) and The Sport Spectator Identification Scale (SSIS) (Wann & Branscombe, 1993). Participants were reached through snowball sampling, beginning members of Israel's basketball community forum on Facebook.

Results: The findings suggest that the need for achievement and the need for social interaction are the key characteristics of devoted and fanatical fans. A significant positive correlation was found between the 'need to escape' and the SSIS.

Discussion and Conclusions: The different types of sports fans that the literature describes explain the motivation and team identification of Israeli basketball fans. The types were reduced to a lean model of low-moderate-high as the SSIS suggests. The significance of the achievement and social factors enhance our understanding of team identification and group fans. The study further suggests that team identification and fans' motivation are strongly correlated to commercial behavior. This unique study may offer a theoretical framework for team identification of sports fans in Israel. Measuring Israeli basketball fans' motives and identification enables us to better understand

the relationship between fans and their teams. It can also help the teams (i.e., sports marketers and sports managers) formulate their marketing strategies in a strategic and well-calculated way, creating a win-win situation for all. Future studies of the Israeli sports eco-system should be expanded to examine the role of teams' management in building fans' identification and motivation.

Power of Sports Tradition and Its Influence on Long-Standing Engagement of Athletes: An Example of Czech Long-Distance Runners

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Background: Czech sport is proud of the oldest road race on the Continent – a 10K running race called 'Běchovice'. It was founded in 1897 and has been hosted each year without a break, that is, 121 times. Involvement in this race became gradually prestigious and almost a cult matter. The special group of runners who participated a minimum of 20 times was formed at the end of the 1980´s and we began to track their performances and effort to gain the utmost number of participation.

Aims: To show how important and influential the role of tradition can play in the field of sports; To illustrate how strong tradition of one race can engage runners in lifelong physical activities; To exemplify how this 'big' tradition can breed 'smaller' traditions of individuals, families, corporate teams, etc.

Methods: We used hermeneutic analysis to interpret the role of tradition. Further we researched a special group of long-distance runners who participated a minimum of 20 times in the named road race. A descriptive statistical evaluation concerning their age, performances and duration of involvement was performed.

Results: Constancy of the route, non-stop organizing without break, special celebrations of anniversaries, the number of attendees, interest of the media and 'brand awareness' were found to be important factors in building loyalty to the race. Anniversary races (especially № 100) had a noticeably higher number of attendees than year around. We found 318 runners who participated a minimum of 20 times in the race (eight of them 50–55 times!) and eight families 64–141 times. In the same manner we could compare the best results in the lifelong perspective and present performance of 40–85-year-old runners (year by year).

Discussion and Conclusions: Tracking running activities through one traditional race enabled us to understand how tradition can build and strengthen motivation to be active to an older age. This lifelong perspective can also encourage former elite athletes to continue in sports activity. The question that arises is whether long-standing running prolongs life. According to our special group of runners, this appears to be the case. However, additional research needs to examine this supposition.

Future Directions in the Study of the Genetic Basis of Sport and Exercise

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The discussion regarding what makes certain individuals excel in their respective fields (sports, music, art, science) has occupied the minds of scientists for a long time. The argument surrounding the infamous question (Nature vs. Nurture) is still very much relevant, all the more so in light of the data accumulated during recent years in the field of genetic research. Athletic capabilities that lead to outstanding performances in various sports are influenced by several physiological attributes (heartbeat, efficient use of oxygen) motoric abilities (reaction time) psychological traits (motivation) and environmental factors (training, nutrition, paternal support) and from complex interactions between all of the above. Many have pondered what defines the roles of genetics and environment in regards to producing elite athletes. Studies of twins and of families show that the genetic component in many physical attributes such as height, strength, aerobic capabilities, motor performance, and motivation amounts to 30%-80%. However, the correct identification of genetic differences, which correlate outstanding physical performance, is complex and difficult, mainly because the aforementioned traits are influenced by numerous genes, as well as the athlete's environment. As of now, more than 200 different genes are currently recognized as directly relating to athletic capabilities and performance, with thousands of genetic polymorphisms. 'Correct' genetics is crucial to the aspiring athlete. That being said, correct genetics without correct nutrition and proper exercise will amount to nothing, meaning that elite athletic performances are clear indicators of a correct amalgamation between genetics and environmental factors. Our current understanding of the role of genetics and exercise is limited primarily to the nuclear genome, while only a limited focus has been given to gene-environment interactions and their effects on trainability and performance. Therefore, thorough research of the genetic factor and of environmental/genetic relations in regards to athletic performance, will contribute to a broader understanding of intricate procedures which indirectly influence athletic achievements, and allow for the allocation of effort towards developing the factors which are indeed influenced by the environment, as well as the development of personalized means which will allow the athlete to maximize his potential.

Genetic Variability among Power Athletes: The Stronger versus the Faster

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Background: Athletic events can be divided into an 'aerobic-type event' or an 'anaerobic-type event' based on energetic usage. Power, speed, and strength, are also used to specify sports subtypes. Weightlifters, sprinters, and jumpers feature high-intensity efforts lasting a few seconds. However, their performance requires different proportions of power, speed, and strength.

Aim: The aim of the current study was to examine genetic differences between subtypes of anaerobic athletes in three relevant genetic variants: ACTN3 R577X, which is associated with muscle contractions, AGT Met235Thr which is associated with muscle growth, and PPARD T/C, which is associated with aerobic metabolism

Methods: Seventy-one sprinters and jumpers (S/J), 54 weightlifters (WL) and 86 controls participated in the study. Genomic DNA was extracted from peripheral blood using standard protocol. Genotypes were determined using Taqman allelic discrimination assay.

Results: ACTN3 RR-genotype frequency was significantly higher among S/J (39.4%) compared to WL (22.2%) and controls (18.6%). AGT ThrThr-genotype was significantly higher among WL (25.9%) compared to S/J (4.2%) and controls (12.8%). PPARD T294C genotype frequencies did not differ between groups.

Discussion: The results suggest that, although both speed and strength are anaerobic qualities, it seems that each is dominated by a different genetic makeup enabling an athlete to excel in speed-oriented events (sprints), or in strength-oriented events (weightlifting).

The 4-Step Method: From Unproductive to Productive Thoughts

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During practice and competition, athletes experience diverse thoughts and emotions. Performance impairments are likely to occur when athletes are unable to let go of mistakes and dwell on negative thoughts (Hanton, Mellalieu, & Williams, 2015). The primary aim of this practical workshop is to introduce a cognitive-restructuring intervention that can assist athletes in shifting from a negative thought as certainty to a naturally-valenced action plan. Secondary aims of the intervention include choking prevention and improvement of facilitative self-talk. The attendees will be presented with the intervention rationale and potential assessments to examine the efficacy of the intervention. The workshop will include a practical demonstration guiding attendees through the 4-step approach. The approach comprises recall of previously-experienced negative thoughts, acknowledgment of their temporary nature, questioning their certainty, and formation of a productive action plan. Hypothetical uses of this technique will be discussed after the activity and additional variations for using this intervention will be provided. Sport psychologists, athletes, coaches, and students can benefit from adding this intervention protocol to their toolbox when working on unproductive thoughts with their clients.

A Comparison of Training Programs of Differential and Structural Learning Regarding Passing Ability in Football

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Background: Since variable practice has been acknowledged to support and enhance motor skill learning, it is of great interest to analyze different variable practice approaches.

Aims: This study's main objective is to compare the effectiveness of a structural (SL) and a differential learning (DL) based training schedule regarding passing ability in football.

Methods: Forty leisure football players from five different local clubs participated in this study. The subjects played for their club's U13 or U15 team (age: M = 12.48, SD = 0.95; years of experience: M = 7.61, SD = 1.64). All subjects were divided into three different groups: DL training group (N=12), SL training group (N=14) and CG (N=14). A pre-post-retention test design was used. After the pretest (T1), the two intervention groups were trained and assessed on their passing accuracy under 'game-representative' time constraints. The intervention was conducted over a period of twelve days. After the intervention the posttest took place, and after another week the retention test (T3) followed. The test battery includes a field test (Loughborough Soccer Passing Test, LSPT) and a test within the Footbonaut, a football specific training and testing device explicitly developed to analyze and train the players' agility and passing ability. Multiple repeated measure analyses of variance (ANOVA Repeated Measures) were executed for each performance variable with a significance level of $\alpha = .05$. In order to examine transferable effects from the Footbonaut performance to the field based LSPT representing game performance. The effects for correlation between both tests' measurements were calculated.

Results: The results show a significant overall performance improvement after the training phase for both considered skill tests. No significant changes between the intervention groups were found for performance development after a one-week retention phase. Considering the correlation effects between the two test measurements, a medium to strong correlation was found between the Footbonaut and on-field performance.

Discussion: Both training programs, DL and SL, improved the performance after a twelve-day training period. The correlation effects indicating that the training in the Footbonaut is valid for an improvement of one's on-field passing ability. Furthermore, the results support the use of the Footbonaut performance to determine a player's actual on-field performance.

Conclusions: Further research comparing these two particular training schedules is needed. Thus, optimal recommendations could be given for a superior and specific training schedule for improving passing accuracy within the Footbonaut.

Learning Soccer Skills in Physical Education: Effects of Bilateral Practice on the Performance Development of Children in Elementary School

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Background: Several studies reveal that bilateral practice can be superior to unilateral practice, even for lower extremities (Focke et al., 2016).

Aims: The aim of the present study was to investigate the effectiveness of a bilateral compared to unilateral practice schedule in football in physical education.

Methods: The study has been designed as a pre-post-retention test design with a total of 119 participating pupils of the 4th grade. Eighty-nine (age: 10-11; boys=45; girls=44) participants remained for the analysis, due to exclusion criteria (missed measurements; missed lessons). A task for determining the dominant leg was performed. The pupils were quasi-randomized into four groups: a control group (N=17) and two intervention groups (bilateral group: N=40; unilateral group: N=32). All three groups were tested with three different motor skill tests at three measuring points (T1, T2, T3). The motor skill tests are part of the official test battery of the German Soccer Association (DFB) including ball control, heading and goal shot. After the pretest (T1) and a four-week practice in physical education, the posttest (T2) was conducted. The two intervention groups completed a specific and standardized intervention between T1-T2, conducted by a football-experienced sport scientist. The intervention units differed in the respective teaching method (bilateral or unilateral), while the content of the lessons were identical for each intervention group. The bilateral group trained alternating with both legs, the unilateral group exclusively with the dominant leg. The intervention was twice a week for 40 minutes in their regular physical education for four weeks. This is a typical time slot in German physical education to introduce a sport. The control group, however, did not complete a specific lesson, but received their regular physical education (gymnastics) taught by the proper teacher. The results of ball control are presented below.

Results: At the beginning (T1) no significant differences existed for all groups. Both intervention groups improved their performance from T1-T2. Statistical analysis revealed a significant interaction between test time and learning group from T1-T2 (p.01; eta^2 = .263): Post Hoc showed a significant decline of performance of the control group (T_{16}=-4,30; p.01) and a significant

improvement of the bilateral group (T_{39}=3,64; p.01). No significant difference between the intervention groups was found from T1–T2. No significant interaction was found between test time and learning group for retention interval (T2–T3).

Discussion: The results show that apparently it makes no difference whether bilateral or unilateral practice is given during an introductory football unit under typical conditions for 10–11-year-olds in physical education.

Conclusion: Future studies should investigate different age groups as well as a longer intervention period to better understand the phenomena of bilateral transfer in football with children in physical education.

The Effect of a Six-Week Program Using Unstable Surfaces for Upper Body on Shoulder Proprioceptive Capability and Strength among Young Competitive Swimmers

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Background: Swimming requires a large number of repetitive overhead movements that may expose competitive swimmers to pain and muscle injuries in the upper limbs. The effect of training the proprioceptive system on pain reduction, performance improvement and injury prevention has been extensively documented in many knee and ankle joint studies. Those studies include exercises on unstable surfaces. Despite the importance of the proprioceptive system, swimming training routines do not include specialized proprioceptive training.

Aims: The aim of the study was to investigate the effect of implementing exercises with unstable surfaces, on proprioceptive abilities and to strengthen the shoulders of young competitive swimmers.

Methods: Fifty-five young competitive swimmers were divided into two age and gender matched training groups. Both intervention group (GRP1) and control group (CO) performed an upper body strength-training program, three sessions per week for six weeks. GRP1 performed the exercises on unstable surfaces and CO performed them on stable surfaces. The training program included six upper body drills, three sets of each drill in a varied range of repetitions. The participants started the program in a given difficulty level according to their abilities and were assessed each week. If their abilities improved in a certain drill the difficulty level was raised. All swimmers were assessed for shoulder peak torque and proprioceptive ability before and after training.

Results: A significant difference was found in the proprioceptive ability (that was improved) after the training program for CO in the right hand (p.05). In the other variables, the differences were not significant. There was no significant difference in shoulder strength between pre-training and post-training.

Discussion and Conclusions: Shoulder strength and shoulder proprioception were mainly unchanged in both groups. It is necessary to continue seeking the appropriate training program the improvement of strength and proprioception of the shoulder in young swimmers.

Evaluation of Ten Years of Talent Identification in German Handball

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Background: The German Handball Federation (DHB) conducts a talent identification program with female (14–15 years) and male (15–16 years) youth handball players each year. In 2008, the DHB launched a modified talent identification program with anthropometric, motor and psychological tests hoping to improve the prognostic validity of the talent identification.

Aims: The aim of this long-term study was to evaluate the modified talent identification program in general and especially the prognostic validity of the different tests. Therefore, we investigated which of these tests differentiates between youth team players nominated and not-nominated by the national coaches and how constant those results are over time.

Methods: The youth handball players from 20 regional selection handball teams (N = 480, an additional 240 female and 240 male players each year from 2008–2017) performed a series of anthropometric, motor and psychological tests. Additionally, they were observed playing varying forms of handball. Stepwise discriminant function analyses were conducted separately for each year.

Results: The results indicate that the identified tests per year change very little from a content perspective. Prima facie, the predictive validity seems initially sufficient.

Discussion and Conclusions: While these results show that a first step was taken, we also suggest that the predictors are not sensitive and specific enough for long-term development. Therefore, the talent identification program will be expanded by technical and tactical tests with open skills to improve 'long-term predictive validity'.

Absorbing Coaches and Athletes from the Former Soviet Union in Israel

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The dissolution of the Soviet Union in 1991 resulted in the opening of its gates and a mass exodus of Jews to Israel. Around a million Soviet Jews immigrated to the Jewish state. Among them were also hundreds of athletes, coaches, physical education teachers and sports scientists. In this paper I examine the efforts of the Ministry of Education and the Ministry of Absorption to absorb those immigrants engaged in sports. Sports culture in the defunct Soviet Union differed greatly from sports culture in Israel. While sports could ostensibly have served as a bridge between the immigrants and the Israelis, the disparity between the sports culture in the Soviet Union and that in Israel was too great. Many of the immigrants chose to attend ethnic sports clubs where they could preserve their Soviet patterns of behavior. The paper discusses the social and professional barriers that prevented the immigrants from integrating into Israeli sports. One of the conclusions is that Israeli sports did not manage to exploit the full potential of the Russian immigrants and did not reap long-term benefits from their abilities.

Integrating Mathematics in Physical Education

Udi Caspi

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Background: The findings in the literature about the effect of physical activity on academic achievements have been equivocal. Some of the studies reported an improvement in arithmetic among girls when one weekly lesson of PE was added, and others found that boys improved academically in general when a PE lesson was added every day.

I initiated this project long before I read articles on the subject. I wanted to examine whether physical activity could be used for illustrating arithmetic concepts and abstract thinking. Many children have difficulty with math and even with simple arithmetic functions such as addition and subtraction. I thought that experiential and creative activities might help at least some of them. I adopted the 'Children enjoy when they understand principles' approach. A feeling of mastery can ultimately lead to a love of arithmetic.

Aims: To improve knowledge of arithmetic by means of physical activity, and to create experiential learning that combines the senses and physical activity.

Methods: Participants were 100 first-grade pupils from three classes at the Einstein School in Haifa. The population was homogeneous in that they all came from the highest socioeconomic level in Haifa. The program lasted 13 weeks. Classes were divided in half and 15–18 pupils participated in each lesson which was given alternately to each half. Each week a third lesson was added to the two PE lessons in the curriculum. These lessons included arithmetic exercises integrated into relay race games. No homework or home tasks were assigned and no other teachers or parents participated in the project.

Discussion and Conclusions: The project was not originally intended for research purposes but my impression was that the project contributed to an understanding of the arithmetic material. Some of the pupils who had experienced difficulties succeeded by means of this assistance to overcome their problems. The reactions of the parents, teachers and children reinforced this feeling.

My feeling was that the program did not provide enough physical activity or enough arithmetic activity. Therefore, my lessons today are built differently. Both physical activity and arithmetic receive greater expression. In addition, children work at a variety of work stations with activity cards.

Limitations: The children attended regular arithmetic lessons several times a week so improvements are not necessarily attributable to the PE lessons. Each class had different arithmetic teachers, each one teaching in her own style. Also, differences between the classes were found from the start.

Growth, Nutrition and Dance

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Background: The scientific literature consistently shows that members of the performing arts are at a higher risk factor to suffer from eating disorders and nutritional inadequacies. These disorders can impact not only their performance, but also their wellbeing and growth.

Aim: In this presentation, the use of two common growth charts will be introduced and explained, enabling the teacher or instructor to detect the changes that require professional intervention. These charts also provide an excellent indication of proper weight to height ratio for all ages and both gender.

Suboptimal intake of protein, water and key minerals will also be discussed.

Discussion: Proper eating habits should be developed at the earliest stage possible. Linking good nutrition with effective practices and superior performance will encourage good nutrition. The use of nutritional supplements is unwarranted, just as long as the right food is consumed.

Effects of Nordic Walking on Some of the Cardiovascular Risk Factors in Older Women with Type 2 Diabetes Mellitus

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Background: Daily exercising is an integral part in the management of type 2 diabetes (Parkatti et al., 2012; Naci & Ioannidis, 2013; Balducci et al., 2015; Balducci et al., 2017). Persons suffering from type 2 diabetes, are recommended moderate intensity physical activity to vigorous aerobic exercise, for at least 150 minutes a week (American Diabetes Association, 2015). But most of them cannot perform high intensity physical load because of their impaired functional capacity (Weinstock et al., 2011). Walking, as a typical low intensity exercise form, is very popular and highly preferred among persons with type 2 diabetes (Skorkowska-Telichowska et al., 2016). Walking has positive effects on blood pressure control (Lee et al., 2010), weight loss, overweight (Figard-Fabre et al., 2011), fitness and cardiovascular disease risk prevention (Tschentscher et al., 2013; Qiu et al., 2014). Nordic Walking is one of the best physical activity forms to achieve beneficial effects on the cardiovascular and musculoskeletal system because of the higher activity in the muscles involved in the Nordic Walking technique (Parkatti et al., 2012; Tschentscher et al., 2013; Perez-Soriano et al., 2014).

Aim: To assess the effects of Nordic walking on body composition, blood pressure, functional capacity and glycemic control in older persons with type 2 diabetes mellitus.

Methods: A 12-week exercise program consisted of moderate-intensity Nordic walking three times a week, outside, in the afternoon, 60 minutes each session. Sixteen women with type 2 diebetes melitus participated in the open label study. Mean age of participants was 62.7±2.4 years. We assessed body weight (kg), body mass index (BMI), percentage fat mass (FM%), waist and hip circumference, the haemoglobin A_{1c} (HbA1c) level, and functional capacity before and after 12 weeks of the Nordic walking program. Capillary blood glucose concentration, systolic blood pressure (SBP) and heart rate (HR) were measured before and after each workout.

Results: Body weight (p0.001), BMI (p0.001), FM (p0.05), waist and hip circumference (p0.05), HbA1c level (p0.05), SBP (p0.001) and HR (p0.001) significantly decreased after the long-term aerobic exercise program. Functional capacity (p0.05) increased and glycemic control (p0.001) improved for all diabetic women after 12 weeks of the Nordic walking program.

Discussion and Conclusion: Body composition indices, haemoglobin A1c, systolic blood pressure and heart rate significantly decreased, while walking distance increased and glycemic control significantly improved after the long-term aerobic exercise program in older women having type 2 diabetes mellitus.

Displays of Emotions and Their Impact in Competitive Sports

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Competitive sports are a breeding ground for emotions (Friesen et al., 2013). Athletes feel and display emotions including excitement about an upcoming match, disappointment about performance, or happiness when scoring a goal or making a basket. These emotions can also come from coaches, where examples of theatrical emotional outbursts and emotional motivational speeches easily come to mind. While most work on emotions in sports has focused on the individual who feels the emotion and how it impacts performance, we focus on the interpersonal impact of emotion displays. Drawing on the Emotions as Social Information (EASI) theory (van Kleef, 2016; van Kleef, Homan, & Cheshin, 2012), we demonstrate in two separate research projects how displays of emotions of players and coaches have an impact on other athletes. More specifically we look at the information that can be gleaned from emotional displays.

The first project examined emotion displays of baseball pitchers. As reported in Cheshin, Heerdink, Kossakowski & van Kleef (2016), using data from professional baseball games we found that displays of emotion of baseball pitchers before a pitch provide consistent inferences regarding an upcoming pitch. The method of this study was threefold. First, students assessed the emotion displays from videos of baseball pitchers in real games. Based on student agreements videos with pitchers displaying emotions of happiness, anger and worry were identified. Second, another student sample was asked to view the videos and predict various aspects regarding the pitch (speed, accuracy, difficulty and whether the batter will swing). We consistently found that inferences regarding the pitch were made based on the emotions in the videos. Third, we looked at the actual game results and whether there was a relationship between the emotion displays and the actual outcome of the pitch and whether the predictions of the students were accurate. We found that when the pitcher was perceived to be happy there was a greater likelihood for the batter to attempt to swing at the pitch.

In the second project we examined emotion display of coaches in youth sports teams of baseball, softball and soccer. Players and coaches filled out surveys regarding the coach's emotional displays and their own feelings before the game and at breaks during the game. The data provide evidence of emotional

linkage between coaches and players while controlling for the game success. Moreover, coaches' emotional expressions predicted players' performance inferences as well as impacted team performance.

Together, both of these studies demonstrate the social influence of emotions in sports. Thus, the emotions that are displayed by players and coaches have an effect on the thoughts, feelings, actions and ultimately the performance of other athletes. Understanding the social impact of emotion is imperative for players, coaches and sport educators.

The Teaching Materials Catalogue Project

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The aim of the project is to construct a database that maps Physical Education materials. The database will include selected lesson plans, teaching units, annual and multi-annual curricula, games and activities for use in lessons and computerized auxiliary materials. Materials will be classified by age level, sport, objectives, teaching methods and skills so that specific material can be retrieved as needed. The materials will be stored in a site to be constructed for this purpose.

Students, PE teachers, sport coaches and those interested in physical activity will have access to the database and can use the materials for their professional needs. They can also promote themselves by publishing materials. Users can rate and respond to materials. They can also offer and share their experience. In this way all users can see the rating of materials and insights from previous users.

The Hachsharaton, the College's digital and hard copy newsletter with lesson plans and activities from many sources, will be the first source to be mapped. Additional teaching materials will be uploaded from old journals such as Hachinuch Hagufani V'Hasport, the library, internet sites and books. Pedagogical advisers and lecturers in the various sports can also send in their materials to the database. The catalogue will offer extensive PE materials in one comprehensive site for all users. and will be maintained and updated on a regular basis.

Gender Differences and Previous Experience in Overhand Throw

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Studies clearly indicate that gender differences can be found in ball velocity scores, with an advantage for boys, and that velocity scores increase with age (Cohen, Goodway, & Lidor, 2012; Garcia & Garcia, 2002; Goodway & Lorson, 2008). However, the relationships between product measures (ball velocity scores) and process measures (the form of the throw) are still not clearly understood. This study examined the relationship between gender differences and previous experience of the overhand throw for force, in a naturalistic physical-education setting.

Ninety-seven third-grade students (39 girls, 58 boys) with a mean age of 105.4 months (SD = 4.76) participated in this study. All the students were asked to answer two questions associated with their previous experience with throwing. The data were recorded and were later analyzed related to the students' throwing experience.

Prior to the intervention, significant gender differences existed at the pretest, with boys having greater mean recorded velocities than girls. Both genders improved significantly in ball velocity from pretest to posttest. However, the boys continued to significantly outperform the girls throughout the intervention at the posttest and retention test. Both genders maintained their performance gains from the posttest to the retention test. In addition, more boys than girls replied 'yes' on both of the questions related to previous throwing experience.

It might be that the intervention was not powerful enough for the girls to catch up with the boys, as the differences between them from the start were too big to overcome and therefore enable the girls to improve performances in such a short period of time. Although gender was a strong predictor for the differences, it is not clear what it is about 'gender' that accounts for these differences. Additional research should examine this instructional issue.

Fencing Training Effect on Musculoskeletal Fitness in Children Diagnosed with Attention Deficit Hyperactivity Disorder

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Background: Musculoskeletal fitness (Mf) is a multidimensional design comprising the integrated function of muscle strength, muscle endurance, and flexibility constructed to enable the performance of work against one's own body weight or external resistance. The Mf variable was investigated as a part of wider research relating the fencing training effect on attention deficit hyperactivity disorder (ADHD) symptoms of children according to DSM V (Diagnostic and Statistical Manual of Mental Disorders 2013).

Aims: The present research intends to examine the effect of a fencing training program on Mf of a youth population diagnosed with ADHD.

Method: One of the suggested tests for Mf evaluation is the Eurofit Test Battery that was applied for the research. The study population, (N=40) children, mean age of 10 at the beginning of the study and diagnosed with ADHD, was divided into two groups: one is the experimental fencing training group (N=20, 10 boys and 10 girls) applying a fencing training program combined with a general physical activity (PA) program; the second group, the PA control group (N=20, 10 boys and 10 girls) of about the same age and characteristics undergoing only a Physical Education (PE) training program. The duration of the research was nine months, twice a week, 90 minutes each session.

Results: As a standard procedure, the Eurofit Test Battery includes anthropometric measurements of height, weight, Body Mass Index (BMI) and % body fat from skinfold thickness that were found to be homogenous for both groups. The results of the ten different tests of the Eurofit Test Battery were monitored at the beginning of the experiment and once again after carrying out the intervention programs, indicating distinctive superiority of the fencing program over the PA program.

Discussion and Conclusions: The results support the presumption that fencing is a better stimulant for improving Mf of ADHD diagnosed children over a plain PA program. The control group undergoing the PA program achieved definitive higher results only for non-essential attributes to fencing like the Flamingo Balance test and for the muscular upper body development as reflected by the Arm Bent.

Further research for evaluating the extended benefits of a fencing training program is recommended by similar research with the same population for a shorter period of time and increasing the number of training lessons per week and the number of samples. Other alternatives could be similar research with different types of populations, for instance normative children or other behavioral disorders like Obsessive Compulsive Disorder (OCD) and Oppositional Defiant Disorder (ODD).

Effect of a 4-Month Exercise Training and Omega-3 Supplementation on Memory in Elderly Women: Preliminary Results

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Background: Age-related cognitive decline is common worldwide and contributes to dependence, lower quality of life and disability in the elderly (Itua & Naderali, 2010; Lojko et al., 2015). Therefore, lifelong development and preventive measures are of high importance. Many modifiable factors have been studied in relation to cognitive function in the elderly. Regular physical activity (PA) is a significant factor positively influencing cognitive functions as was confirmed by a series of studies. The protective role of nutrients in the development of dementia, such as omega-3 fatty acids, B vitamins, and specific dietary patterns was reported as well. However, a combined effect of PA and omega-3 supplementation on cognitive functions has not been studied yet.

Aims: The aim of this study was to assess changes in short-term memory after a four-month exercise training only or in a combination with omega-3 supplementation. This study was a part of EXODYA (Effect of EXercise training and Omega-3 fatty acids on metabolic health and DYsfunction of Adipose tissue in elderly) research project (nr. AZV 16-29182A).

Method: Twenty-three healthy women of age 65-80 were enrolled in the study in the first year. They were assigned to an exercise plus supplementation group and to an exercise only group (placebo supplementation). The exercise intervention program contained functional circuit training (twice a week, 45 min plus 15 min of stretching and balance training) and Nordic walking (once a week, 60 min) for 16 weeks. Memory was assessed by the POBAV (PICNIC) test of naming and recalling 20 pictures, both before and after the intervention program.

Results: The preliminary results of the 23 subjects showed a statistically significant improvement of short-term memory (mean no. of recalled pictures: 10.35±2.9 vs. 11.74±2.6, $p<0.05$) after the four-month program. The group with exercise and omega-3 had greater improvement (10.3±3.4 vs 12.1±2.5) compared to the exercise only (placebo) group (10.4±1.9 vs. 11.1±2.8).

Discussion and Conclusions: Understanding the benefits of physical activity and diet quality in older age is central to considerations of future public health strategies to promote better physical function and health in later life. Previous

research has described that long-term exercise training improves cognitive functions in healthy elderly people (Nouchi et al., 2014). The combined effect of exercise and omega-3 supplementation seems to be promising in prevention of age-related decline in memory. However, the exercise only group had only eight subjects and data showed great inter- and intra-individual variability. Further research is needed to confirm these results.

Beneficial Effects of Small-Sided Games as a Conclusive Part of Warm-Up Routines

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The aim of this study was to compare the effects of small-sided games (SSG) and traditional warm-up strategies on the mechanical, physiological, and perceptional responses of handball players. Using a randomized and counterbalanced design, 12 elite male handball players completed a general 8-min warm-up which was concluded with an 8-min section of either specific handball shooting drills or 3 × 2 min of SSG with a passive recovery of 1 min between bouts. Countermovement jumps and plyometric press-ups were assessed before and immediately after the warm-up regimens using a force plate. Heart rate (HR) was assessed during the warm-up regimens, and rating of perceived effort (RPE) was assessed after the regimens. Meaningful differences favoring SSG were observed in most of the kinetic variables in the countermovement jumps and plyometric press-ups (|Hedges' g| = 0.26—1.42). Conversely, no meaningful differences were found between warm-up regimens in RPE or HR responses (z-scores = 0.45 and 1.88, respectively). These results indicate that concluding warm-ups with SSGs offer greater benefits compared to a more traditional warm-up routine, despite similar HR and RPE responses even when matched for duration among elite level handball players.

Exercise Testing and Prescription in Children and Young Adults with Congenital Heart Disease

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The survival of children with congenital heart disease (CHD) has improved dramatically over the last two decades, and most young patients will now reach adulthood. However, adults with CHD might have increased rates of obesity, low fitness, cardiovascular risk factors and events, and even mortality, compared with the general healthy population.

Exercise training programs for patients with CHD may help them in maintaining a healthy lifestyle and decreasing their risks for adulthood morbidity. When prescribing exercise to a patient with CHD, several factors should be taken into account: the type of exercise to be performed, its intensity and duration; the type of heart malformation and the corrective procedures performed; the presence or lack of anatomical residua; ventricular function; pulmonary arterial pressure; oxygen saturation in rest and exercise; the initial fitness level; and any electrocardiographic changes during exercise.

Cardiopulmonary exercise testing (CPET) can evaluate maximal aerobic performance and cardiac function, and can provide important information on prognosis, functional outcomes and the safety of exercise. For these reasons, clinical guidelines support the routine use of CPET in the periodic evaluation of children and adults with CHD. Further, CPET is of paramount importance in providing a safe and effective exercise prescription in this unique population.

Exercise prescription for patients with CHD should be personalized, as any other medical treatment. In our clinic, exercise recommendations are individually tailored according to the patient's aspirations and clinical status, CPET findings and available guidelines.

The Effect of Acute Resistance Exercise on Executive Function and Attention of Adults

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Background: The effects of chronic physical activity (PA) on cognition in adults have been extensively investigated. Evidence from recent studies showed that acute PA such as aerobic or resistance exercise results in improvements in different cognitive functions, however it is not clear which intervention has the highest effect.

Aim: To assess the influence of acute bouts of resistance versus aerobic exercise on executive function and attention of adults.

Methods: Thirty-nine physically active adults (age = 52±8 yr) served as participants. Each participant visited the laboratory four times: on the first visit participants performed a computerized cognitive test (NeuroTrax) followed by an aerobic fitness assessment, as well as maximal strength test composed of six exercises. During visits 2-4, participants completed the cognitive test before and after the experimental condition, which consisted of either 25 min of aerobic exercise or resistance exercise, or watching a recorded interview show in a seated position (control condition).

Results: Findings indicated significantly higher changes in scores of attention after acute aerobic exercise (mean change 3.46, 95% CI -0.32, 7.27) than following the control condition (mean change -0.64, 95% CI -2.23, 0.96). The changes following resistance exercise (mean change -0.67, 95% CI -4.47, 3.13) were not significantly different from the changes following the control condition. Executive function scores showed a marginally significant improvement following acute aerobic (mean change 4.06, 95% CI 1.68, 6.44) and resistance exercise (mean change 3.69, 95% CI 0.78, 6.60), but not after control (mean change 0.91, 95% CI -1.21, 3.02).

Discussion: The present study extends the knowledge on the improvement in executive functions and attention following a moderate intensity aerobic exercise session. In addition, it points to the effect of resistance exercise on executive functions. More studies are needed to explore the mechanisms mediating between aerobic and resistance exercise and cognition.

Conclusion: We suggest that adults should consider augmenting both modalities into their training routines, which may improve their cognition in addition to providing other physical benefits.

The Effect of a Single Bout Physical Activity on Procedural and Declarative Learning and Memory Processes in Young Adults with and without ADHD: A Review

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Attention deficit hyperactivity disorder (ADHD), characterized by age-inappropriate symptoms of hyperactivity, inattentiveness, and impulsivity is one of the most common developmental disorders, characterized by executive function deficits that may affect the ability to learn and retain in memory new skills as well as new information. Structural and functional neuroimaging studies of brains of individuals with ADHD have revealed differences compared to typical peers in multiple brain systems including circuits implicated in repeated task performance and skill learning. Evidence-based treatments for ADHD fall into two categories: pharmacological interventions and behavior-based psychosocial treatments. Pharmacologic treatments are quite effective for reducing the inattention and hyperactivity/impulsivity characteristic of ADHD. Psychosocial treatments have also been reported to improve behavior. However, treatment gains tend to be short-lived, with limited, if any, long-term beneficial effects.

One potential treatment approach that is beginning to attract scientific scrutiny is the employment of physical exercise. Extensive evidence suggests that PA has powerful effects on brain function and structure. Although the physiological underpinnings are not clarified, a growing number of studies indicate the beneficial effects of PA on different cognitive functions, such as: executive functions, attention, cognitive speed, and episodic memory.

Many researchers have examined the effect of PA on cognitive functions, with only a few directly assessing the effects of PA on learning or on long-term memory. The differences between the immediate and the delayed effect of PA on cognitive function depend on learning and memory processes, which are usually separated into three main phases: the fast learning phase, the consolidation phase and the long-term retention phase. However, in cases of ineffective learning consolidation phase gains may not occur. As deficits in the sustained engagement of attention resources and reduced inhibition of

incorrect responses may lead to ineffective learning consolidation in ADHD, researchers tested the effect of strategies that may upregulate arousal levels, which are typically low in ADHD. Recently, the role of PA in creating effective learning, and effecting different phases of learning and memory has moved into the focus of research. This was mainly studied with participant without ADHD.

The type of PA being performed may differentially affect cognitive functions. To date, most researchers investigated changes in cognition after an acute bout of aerobic or resistance exercise. Other forms of exercise may also affect cognition. Postural stability and coordination exercises are known to involve activation of the cerebellum, which influences motor functions as well as a variety of neurobehavioral systems including attention, working memory, and verbal learning and memory.

In the lecture, the effect of different types and intensities of PA on learning and memory processes among people with or without ADHD will be discussed.

Patella Tendon and Achilles Tendon Structures among Children and Adolescents of Different Weight

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Overweight and obesity among children have increased dramatically in the last decade. There is proof that obesity during childhood is related to a significant number of metabolic and physiological diseases, and comorbidities such as diabetes. In addition, gait patterns and irregular foot structures which influence walking patterns and the ability to walk short and long distances, have been found different in obese children compared to normal weight children. However, few studies have discussed the influence of childhood obesity on the structure and function of the skeletal body and its soft tissues.

The Patella tendon and the Achilles tendon located in the distal limbs are naturally weight bearing tendons. In cases of obese people, where there is more weight to carry, these tendons are exposed to larger loads and therefore, are more vulnerable to structural changes, ranging from the easiest changes like disorganized fibrillar matrix, up to difficult changes like Achilles and Patella tendinopathy.

Physical activity can be a good and effective solution to reduce weight, however, one must be careful with the frequency and the load that the tendons are exposed to. In general, tendons react positively to optimal load, resulting in a stronger and more load-tolerant tendon by improving the tendon's structure and remodeling it. On the other hand, when the load is excessive, the tendons may react in a negative way where the tendons transition into a reactive tendinopathy or degeneration stage.

For many years, the use of the conventional ultrasound (US) was introduced as a reliable method for the quantification of the tendon structure. However, the problem with this device was that it was often subjectively graded, with limited ability to quantify tendon structure and integrity. Recently, a new imaging technique that attempts to remove the reliance on subjective interpretation, and to use the features of US to quantify parameters in the tendon, called ultrasound tissue characterization (UTC), was invented. The UTC creates a three-dimensional image, rendered from 600 transverse US images that are

captured every 0.2 mm over the length of the tendon. This technique enables us to define the different types of fibers that compose the tendon's structure.

In adults, the correlation between obesity and structural changes in the Achilles and the Patella tendons is significant. Is this the same in children? The aim of this review is to better understand the correlation between obesity, physical activity, and tendon structure among obese children. It is hoped that the conclusions of the present review, as well as additional future studies, will open new venues for better understanding the impact of continuous weight/loads on children's tendons, and for suggesting the optimal exercises/loads for obese children who enter a weight-reducing exercise program and are at high risk for musculoskeletal injuries.

Financial Costs of Injuries in the English Premier League

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The world of professional sports requires athletes to perform at high intensities and at the limit of their physical capacity. Therefore, professional athletes often suffer from injuries of various types and different severities. In individual sports, the effects injuries have on the athlete's performance, success and financial profit are implicit. In contrast, the effect of a single injury or a single player's absence in team sports is much harder to quantify both from the performance perspective and the financial perspective. In this study, we attempted to estimate the effect of injuries on the performance of football teams from the English Premier League and the financial implications deriving from this effect. The analysis that will be presented is based on data regarding results, injuries and estimations of players' financial value from the seasons 12/13 to 16/17. We found a statistically significant relationship ($p = 0.001$) between the number of days out due to injuries from which a team suffers during a season and the point/place difference between their actual and expected finish in the premier league table (according to overall player value). Moreover, we can interpolate that approximately 136 days due to injury cause a team one league point and that approximately 271 days out due to injury cost a team one place in the table. These formulas enable us to conclude that an English Premier League team loses an average of 45 million pounds due to injury-related causes, based on wage bills and prize money sums.

Practical Applications of Data Analytics in Professional Football

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Professional football teams collect continuous data from various sources that are relevant to every aspect of the game. Technological advancements in recent years enable teams to have extensive tracking of their players' physical state and have full statistical information from their matches and training sessions. Having said that, the amount of data teams collect these days often create a data overload that limits the benefit a team's technical staff can extract from the data they invest valuable time, effort and funds in collecting. This session will demonstrate practical applications and insights which can be extracted from the above mentioned data sources. We'll present real-life case studies from professional football teams regarding tactical analysis, training vs. match intensity, workload monitoring and player recruitment. The case studies that will be presented were formed using various statistical methods, including artificial intelligence and machine learning.

Pre-Season Fitness Level and Injury Rate in Professional Soccer – A Prospective Study

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The aim of the present study was to assess prospectively the effect of pre-season fitness on injury rate during the competitive season among professional soccer players. Thirty-one players participated in the study during two consecutive competitive seasons (2015-16 and 2016-17; a squad of 22 players in each season). During the six-week pre-season training period (8 training sessions and a friendly match every week, 14-18 training hours/ week) there was a significant improvement in VO_2 max, a significant increase in ideal and total sprint time and no change in vertical jump, flexibility and repeated sprint test performance decrement. During the two consecutive seasons 28 injuries were recorded. Ten injuries were classified as mild (missing 3-7 days of practice/match), eight as moderate (missing 8-28 days) and 10 as severe (missing 28 days). The rate of match injuries was higher (9.4 per 1000 match hours) compared to practice injuries (4.7 per 1000 training hours). Most injuries were overuse injuries (72%) of the lower limbs (71%). Most of match injuries occurred during the last 15 minutes of each half. There were no differences in fitness characteristics in the beginning of pre-season training between injured and non-injured players. However, improvements in VO_2 max during the pre-season training period were significantly lower among injured players (0.9±5.5%) compared to non-injured players (10.4±6.5%, p0.05). Our results emphasize the importance of pre-season training in professional soccer players not only for improvement in fitness but also for injury prevention during the following competitive season.

Athletic Development and Conditioning of Young and Adolescent Athletes with High-Intensity Interval Training: A Systematic Review with Meta-Analysis

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Background: High-intensity interval training (HIIT) is as a time-efficient alternative to moderate low-intensity continuous exercise for improving variables related to endurance performance in young and adolescent athletes. The aim of the present study is to review original research about the enhancement of endurance and exercise performance in young and adolescent athletes performing HIIT.

Methods: Relevant articles published in peer-reviewed journals were retrieved from the electronic databases PubMed and SPORTDiscus in August 2017. Inclusion criteria were: a) controlled trials (HIIT vs. alternative training protocol) with pre-post design; b) healthy young athletes (≤ 18 years); c) assessing variables related to endurance and exercise performance. Hedges´ g effect size (ES), and associated 95% confidence intervals were calculated for comparison of any outcome between experimental (HIIT) and control trials.

Results: Twenty-four studies, involving 577 athletes (mean age: 15.5 ± 2.2 years), were included in this review. HIIT exerted small mean positive ES on peak oxygen uptake (VO_{2peak}), running performance, repeated sprint ability, jumping performance and submaximal heart rate. The average increase in VO_{2peak} from pre- to post- was 7.2 ± 6.9% with HIIT vs. 4.3 ± 6.9% with any kind of control intervention. HIIT largely and positively affected running speed and oxygen consumption at various lactate- or ventilatory-based thresholds, as well as for running economy and sprint running performance. Calculations showed negative mean ES for change-of-direction ability (large), and peak blood lactate concentrations (small).

Conclusion: The present findings suggest that young athletes performing HIIT improve certain important variables related to aerobic, as well as anaerobic, performance. With HIIT, most variables related to endurance improved to a higher extent, compared to alternative training protocols. They should also benefit from the time efficient character of HIIT compared to other training regimes.

Effects of One Week Taper Training on Physical Performance Parameters in Soccer

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Background: Soccer is a sport branch which is highly physical and with physiological performance demands. Therefore, the most important aim for coaches is to increase the physical and physiological abilities of the athletes to reach maximal performance at the right moment of the season. Taper training is a common training strategy which is designed to reduce physiological and psychological stressors of previous training before major athletic events with the aim of maximizing competition performance (Mujika et al., 2004). However, there are few studies examining the effect of taper training on selected physical performance parameters in soccer.

Aims: The aim of this study is to monitor the changes in selected physical performance parameters in amateur soccer players during a one-week taper immediately following six-week progressive overload training.

Method: Fifteen male amateur soccer players volunteered to participate in the study. The study consisted of a six-week progressive overload period followed by a one-week taper training. Small-sided games were used as a method to train at an anaerobic threshold intensity during the training intervention. Training load for each subject was calculated using a rating of perceived exertion (CR-10 Scale). Measures of body mass, percentage of body fat and VO2max were taken before and after overload training and taper. Also 10 and 30 m sprint performance, balance, flexibility and isokinetic strength of 600/sn and 1800/sn for knee extensors and flexors were measured at the end of overload and taper period. To determine the differences, the data were analyzed using an analysis of variance (ANOVA) for repeated measures and paired sample t-test.

Results: Significant decreases in body mass, percentage of body fat and significant increases in VO2max were detected after taper training when compared with overload period and pre-training (p0.05). Compared to the end of the overload period, 10 m and 30 m sprint time were decreased and flexibility were increased after the taper training (p0.05). There were no significant changes in static balance over the six-week overload training and taper period (p0.05). The six-week overload training and taper period test values of the peak isokinetic strength, at 60°/s and 180°/s for right knee

flexion significantly increased from the first to second evaluations (p0.05). Also a significant increase in right leg hamstring to quadriceps ratio (H/Q ratio) at an angular velocity of 60°/s and 180°/s were observed (p0.05).

Discussion and Conclusion: Findings of this study suggest that taper training may increase some physical performance parameters in soccer.

Newcomb Ball: Training Effect on the Physical Fitness of Women at Midlife

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EG showed significant improvement in arm power (5.3 ±0.9 vs 5.6 ±0.9 m), agility (10.68 ±0.95 vs 10.37 ±0.89 sec), speed (4.11 ±0.45 vs 4.01 ±0.33 sec) and aerobic fitness (563 ±328 vs 680 ±378 m) (ES = 0.45 – 0.61, p<.001 for all) following training, while no significant changes, except for a significant increase in arm power (ES = 0.42, p<.05), were found for the CG in any of the fitness variables following training.

No significant changes were found following training for either group in anthropometric or resting physiological values, except for a significant increase in body weight for the CG (ES = 0.43, p.05). The findings indicate that Newcomb ball training can be used as an efficient and enjoyable tool for fitness development among midlife amateur women players.

Effectiveness of Plyometric and Resistance Training in Young Adolescent Athletes

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Background: In adults, the rate of neural activation is a major factor in determining the rate of torque development, while the latter is a central determinant of jump performance. This relationship is unclear in youths. Further, the effects of resistance and plyometric training have been widely used and studied among adults, but much less so in children.

Aims: a) To examine the relationships between neuromuscular activation, maximal and explosive strength, and jump performance; b) To compare the effects of eight-week free-weight resistance (RT) and plyometric (PLYO) training, on muscle hypertrophy, maximal and explosive strength, associated electromyographic variables, as well as on squat-jump performance in young male athletes.

Methods: Forty-one 11-13-year-old soccer players were divided into three groups: RT, PLYO, and control (CON). All participants completed isometric and dynamic (240°/s) knee extensions pre- and post-training. The association between peak torque (pT), peak rate of torque development (pRTD), jump performance, and neuromuscular activation was examined pre-training. The change in pT, pRTD, rate of muscle activation (Ra), m. vastus-lateralis thickness (VL_T), and squat-jump height was compared between groups.

Results: Isometric pT and pRTD were strongly correlated (r=0.71), but not related to jump height. Dynamic pT and pRTD, normalized to body mass, were significantly related to jump height (r=0.38-0.66, p0.05). Normalized, but not absolute dynamic pRTD was significantly related to Ra (r=0.35, p0.05). No such relationship was observed in isometric contractions. Training resulted in significant (p0.05) increases in isometric pT (23.4 vs. 15.8%) and pRTD (15.0 vs. 17.6%), in RT and PLYO, respectively. Training significantly improved dynamic pT (12.4 and 10.8% in RT and PLYO, respectively), but not dynamic pRTD. Jump height increased in both training groups (RT=10.0%, PLYO=16.2%), but only PLYO was significantly different from CON. VL_T significantly increased in both RT (6.7%) and PLYO (8.1%). Ra increased in both groups (22 vs 44% in RT and PLYO, respectively), but this increase was not statistically significant.

Conclusion: In young athletes, neuromuscular activation and rate of torque development in dynamic contractions are related to jump performance,

while, contrary to the case in adults, isometric contractions are not. Eight-week resistance or plyometric training, in addition to regular soccer training, improves strength and jump performance in young adolescent soccer players. Improvements following both training types were facilitated by neuromuscular changes as well as muscular hypertrophy. The findings have implications for the choice of training and assessment methods for young athletes. Gains in general strength (pT and pRTD), even in high-velocity, dynamic contractions, are best attained via resistance training. Plyometric training, shown most effective in improving jump performance, can also be expected to be superior in improving contractile explosiveness in other activities (e.g., sprinting), where contractions are immediately preceded by musculo-tendinous stretching (i.e., involving the stretch reflex).

The Effect of Placebo on Aerobic Stress Test Results in Normal Weight Children

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Background: Placebo has been traditionally defined a medically inert substance used primarily as controls in clinical trials. However, in recent decades, more and more studies have started focusing on the placebo effect as a psychobiological effect carrying curative potential. The aim of the study was to examine the influence of the placebo effect on physical fitness test results in normal weight children.

Methods: Twenty-four pre-pubertal normal-weight children aged 6-13 years participated in the study. Subjects underwent anthropometric measurements (weight, height, BMI percentile, and fat percentile), a progressive treadmill exercise test to evaluate fitness, and completed a habitual activity questionnaire. The participants were examined twice, in random order, with each child being compared to him/herself. Different types of information were provided regarding a water drink consumed prior to testing - standard information (water) vs. deliberate positive information (presumed energy drink, placebo).

Results: Following the placebo drink, children demonstrated significantly higher peak pulse (177.9±13.6 vs. 189.8±12.2), higher stage achieved and longer time of exercise to exhaustion (700.1±155.2 vs. 893.3±150.1). Although the exercise duration was longer, stage and heart rate achieved were higher, the reported average, and peak rate of perceived exertion (RPE) were significantly lower for the placebo [11.7 (11.3-12.6) vs 10.4 (9.7-11.0)]. Moreover, although effort was higher while drinking placebo (longer run, higher exercise phase, higher heart rate), recovery time was significantly shorter. The reported differences were not associated with order of tests, age, gender or child activity level.

Conclusion: Our results demonstrate a significant information placebo effect on children's fitness test results. This highlights the possible role of positive information (placebo) in trying to encourage physical activity in children. Whether this effect could be applied to longer term interventions has yet to be tested.

A Multidisciplinary Approach to Olympic Studies

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This presentation discusses the nature of Olympic Studies as a multidisciplinary approach which is able to unravel the complexity of the different phenomena which lie in the Olympic Games and its culture. The modern Olympic Movement has developed on the basis of the late 19th-century Western and European cultural parameters and a Eurocentric view of the world. The contemporary Western thinking and of its cultural derivatives (products, services, institutions, imaginaries) have been constructed in a linear, minimally interconnected and very hierarchical way, with a center and periphery and, on occasions, very little flexibility. The East, however, draws its inspiration from other sources. Its way of thinking is circular; everything is relative, nothing is central or peripheral and everything changes, though the essence remains the same. An Olympic Movement that really wants to be universal should seek out a blend of East and West. Olympic Studies are a universal phenomenon. Two important reasons for that are the role of old and new media, through which the sports phenomenon is universally disseminated and followed, and the focus of the Olympic studies on multiple interconnected dimensions of the Olympic Games and the complexity that they enfold as a cultural and social event.

Parental Occupational Executive Training (POET) – Improving Daily Functioning by Handling Deficient Executive Functions

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Background: Children with Attention Deficit Hyperactivity Disorder (ADHD) cope with numerus daily functional difficulties. About 50% of them may also have Developmental Coordination Disorder (DCD) that summon challenges in their motor functioning. In recent years an increasing number of researchers consider Executive Functions (EFs) as a major mechanism causing ADHD symptoms. EFs include a range of abilities that enable children to have self-control over their behavior, speech, functioning and movement. The Parental Occupational Executive Training (POET) is a new intervention model that was developed in order to improve daily functioning of young children with ADHD while teaching their parents how to cope with children's deficient EFs.

Aim: To present the POET model and its efficacy.

Methods: This study was a comparative, quasi-experimental, crossover and mixed method design. Participants included 72 children aged 3.83–7.08 years (mean age was 5.42, SD =.86) with ADHD symptoms (55 boys), randomized to a study and control group. Parents participated in eight 45-minute weekly individual training sessions, and completed questionnaires to evaluate the intervention efficacy. One of 17 trained occupational therapists evaluated each child, defined two-five personal intervention goals with the parents and implemented the standardized intervention.

Results: There was a significant short-term improvement in children's ADHD symptoms, EFs, goal performance, and management of daily routines. Parents' satisfaction with their child's functioning and perception of their knowledge about EF and skills to support their child's functioning significantly increased. The intervention process will be demonstrated by a case study of a child with symptoms of ADHD and DCD.

Discussion: Study results indicate that the POET is an effective approach to improve children's and their parents' measures, with a focus on providing knowledge and skills to the parents being the central contributing mechanism.

Conclusion: The POET is a novel, effective approach that has early positive effects on daily functioning of young children with ADHD symptoms.

COMT rs4680 Polymorphism and Exercise Motivation among Tennis Players and Swimmers

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Background: Motivation plays a pivotal role in athletic performance. However, the genetic mechanism that underlies motivated performance is unknown. A possible modulator of physical activity (PA) motivation is Catechol-O-methyltransferase (COMT), one of several enzymes that degrade catecholamines (such as dopamine, epinephrine, and norepinephrine). Catecholamines affect a wide range of physical and psychological functions. COMT s4680 (Val158Met) is a single nucleotide polymorphism (SNP) in the COMT gene. The single nucleotide substitution between G-- A results in an amino acid change from valine to methionine at codon 158. The Met allele is associated with the lower enzymatic activity (due to thermos-instability), and with exploratory behavior.

Aim: The aim of the current study was to explore the association between COMT rs4680 Polymorphism and motivation among swimmers and tennis players

Methods: Seventy-six tennis players and 57 swimmers participated in the study. Participants responded to aerobic/anaerobic motivation, mental toughness, and ego-task motivation questionnaires, and their genomic DNA was analyzed.

Results: Tennis players reported higher values of ego-oriented and anaerobic motivation and lower values of aerobic motivation compared to swimmers. Met allele carriers reported higher values of ego-oriented motivation compared to Val allele carriers. Moreover, tennis players, carriers of the Met-Met genotype reported higher values of internal motivation compared to swimmers, carriers of the Met-Met genotype.

Discussion: COMT Met allele is associated with more exploratory, lower COMT enzymatic activity, therefore higher dopamine levels, a lower pain threshold, enhanced vulnerability to stress, yet also more efficiency at processing information under most conditions. Indeed, Met allele carriers reported higher values of ego-oriented motivation. The difference between the reported motivation among Met-Met carriers who are tennis players and swimmers indicates gene-environment interaction.

Conclusion: We conclude that carrying Met allele is associated with higher ego-oriented and internal motivation. especially among tennis players. A direct linkage between COMT rs4680 polymorphism, motivation, and sport was revealed.

Elite Youth Soccer in Germany and Japan: A Cross-Cultural Comparison of Player Cognitions, Training Climates, and Perceived Coach Behaviors

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Background: This study serves as an extension to previous cross-cultural research with German and Japanese youth swimmers (Alfermann, Geisler, & Okade, 2013), which found that competitors in Japan reported a stronger ego orientation, higher scores on combined task and ego emphases, more competition-oriented training climates, and less of an overall connection in coach-athlete interactions.

Aims: The current investigation thus sought to follow up with a team sport focus in the same two countries by examining sport-specific self-efficacy, fear of negative evaluation, goal orientation, perceived motivational climate, and perceived coach behaviors amongst elite-level youth soccer players. The comparison was rooted within the cross-cultural framework of individualism/collectivism, with the German participants regarded as representatives of an individualistic country. The Japanese players were assumed to stem from a less individualistic but more competitive culture in which winning is of paramount importance.

Method: Participants were comprised of 209 male and 115 female players from U15 to U18 teams in both nations. Data were obtained via scales of self-rated soccer abilities as well as subscales of the Task and Ego Orientation in Sport Questionnaire (TEOSQ), Fear of Negative Evaluation (FNE), Perceived Motivational Climate in Sport Questionnaire (PMCSQ), Leadership Scale for Sports (LSS), and the Coach-Athlete Relationship Questionnaire (CART-Q). Multivariate and univariate analyses were conducted on the data, with nation as the independent factor. Regression analysis was also performed to measure associations between player satisfaction and coach variables.

Results: As expected, the Japanese players showed similarities with the previous swimming sample in that they reported higher ego and lower task orientation than the German players as well as more performance-oriented climates and less training and instructional behavior from their coaches. They also reported less closeness in coach-athlete relationships. There were no

significant differences in other coach behaviors, but players in Japan were less satisfied with their coach and training than those in Germany. In addition, the German players' self-rated abilities were higher than the self-ratings of the Japanese, and an interaction effect was found for Gender X Nation in FNE scores.

Discussion and Conclusions: The team sport findings here were similar to the results obtained with individual sport athletes in a previous study. This lends support to the notion that differences between the German and Japanese youth competitors were largely a function of cultural influences—namely, features of individualism/collectivism and the competitive sport ethos within the two nations.

Emotional Intelligence in Coaches' Leadership

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Background: Emotional Intelligence (EI) among coaches refers, among others, to a) the coach's awareness of his/her own emotions and their regulation for the benefit of the athletes, and b) the coach's ability to identify the emotional state of the athletes and intervene in its regulation (Thelwell, Lane, Weston, & Greenlees, 2008). As such, EI has become an important skill in contemporary leadership where self-actualization and peak performance are pursued (Miller, 2003).

Aims: The purpose of this study is to further understand the importance of EI in sport leadership. Moreover, this study aims at exploring the core themes and categories of EI involved in an effective coach-athlete relationship.

Method: A qualitative inquiry was deemed appropriate for data collection as in-depth information was prioritized. To meet this end, elite coaches were interviewed using a semi-structured interview guide. Then, the data were inductively analyzed, using meaningful units, into an hierarchical configuration.

Results: Several themes, categories, and subcategories, regarding the EI concept have emerged with regard to the coaches' interaction with elite level athletes. Some of these categories are more inward-oriented while others are more external-directed. The themes and their underlying categories are presented alongside with representative examples.

Discussion and Conclusions: The implications of these findings are further discussed in the contexts of leadership and performance enhancement. Thus, EI is presented in both coaches' self-management lenses as well as coaching behavior towards athletes.

The Visits of Carl and Liselott Diem at the Wingate Institute, Israel, in the Shadow of the Eichmann Trial (1962–3)

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The summer Olympic Games held in Berlin in 1936 have come to be known in the collective memory of sports history as the Nazi Olympics. Carl Diem was one of the organizers of the 1936 Berlin Olympics, and a central figure in shaping German sports in the twentieth century. Together with Theodor Lewald, he organized the Berlin 1916 Olympics. He was active in the Academy for Sports Studies in Berlin at the time of the Weimar Republic and he made the bid for the 1936 Games in Berlin. The bid was accepted by the IOC in 1931.

After the Nazis came into power in 1933 Diem continued to develop German sports. He convinced the Nazi Propaganda Minister Joseph Goebbels that the Games could be helpful for the Nazi regime at that time.

After the war, during the de-Nazification process that was conducted by the Allied Forces in Germany, Diem was acquitted from any direct membership in the Nazi party, and declared a 'non-Nazi'. The acquittal permitted him to renew his activity in the field of sports in Germany, and he was appointed rector of the Köln German sport University DSHS in West Germany.

In 1958, Mathethiahu Krantz, an Israeli student, turned to Willi Daume, President of the DSB, and to Carl Diem, rector of the DSHS , and asked to be accepted as a student there. Krantz studied in the Köln from 1959 until 1963 While studying he organized the departure of the first delegation from the DSHS to Israel. His offer to Carl Diem to organize a delegation was heartily accepted. Diem, who had visited Israel in 1937, always wished to return there. His request to send the delegation and to head it was easily granted by the German Office for Foreign Affairs.

At that time the Eichmann Trial wad talking place in Israel. Stories of Holocaust survivors were brought to public and to the knowledge of Israeli society for the first time. The issue of German official visits was problematic, and emphasized reluctance concerning German public appearances in Israel. Unfortunately, Carl Diem died in December 1962 but his wife Liselott decided to come with the delegation to Israel.

This article will examine reactions of Israeli decision-makers to the visits of

the organizer of the Nazi Olympics and his wife in Israel. By describing the development of relations between the Wingate Institute and the DHSK and the first visiting German student team at Wingate, I will expose the conflicts and discussions that were made before and during this visit and will discuss the ambivalence between memory vs. present and future.

The Cause of Exercise Intolerance in Patients with Heart Failure and Chronic Obstructive Pulmonary Disease (COPD): A Search for the Best Discriminator

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Cardiopulmonary exercise testing (CPET) is recommended by the AHA for the identification of the key-limiting organ in patients with exercise intolerance or dyspnea. Most CPET diagnostic algorithms are similar: using peak oxygen uptake (VO2p) to define the extent of limitation, and combination of anaerobic threshold (AT) and breathing reserve (BR) for the search of the cause of the specific limitation. A breathing reserve cutoff of 30%, and an AT cutoff of 40% of predicted VO_2p are typically used to separate between pulmonary and cardiac limitations, respectively. However, the specific limitation can be difficult to trace in the presence of coexisting cardiac and respiratory diseases.

This presentation demonstrates the CPET variables with the best ability to discriminate between respiratory and cardiac limitations in patients with COPD, heart failure with reduced ejection fraction (HFrEF) and coexisting state of COPD and HFrEF. Based on current available physiological literature, we will show that:

1. VO_2p tends to be similar between patients with COPD and HFrEF.
2. VO_2 at AT also did not discriminate between patients with COPD and HFrEF.
3. VO_2/WR slope showed poor to moderate discriminant ability of these clinical populations.
4. On the other hand, BR and % of predicted O_2 uptake efficiency slope (OUES) had the greatest ability to discriminate between COPD and HFrEF.

Therefore, we can conclude that OUES and BR are the best discriminators between COPD and HFrEF, and can assist in establishing the key limiting factor of exercise intolerance in these typical patients. In order to enhance this knowledge, case reports of CPET in these common clinical populations will be presented to show the applicability of these two discriminators.

Secrets of a Powerful Tennis Stroke: Physics, and Nothing Else

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Background: The present tennis teaching methodology is based on putting together some 10–15 elements that constitute an efficient tennis stroke. Most students fail to achieve impressive results, and they drop out.

Aims: The target was to understand the physics of an efficient tennis stroke and, on the basis of this, to define the actual elements of a stroke—elements that can easily be passed to students.

Method: Over 100 clips of professional players' strokes—forehand, backhand and serve—were examined to identify the basic elements that create the movement and contribute to the speed of a tennis ball. Two elements were identified in the clips: 1) Initiation of the racket movement in a large body, the player's torso, and transfer of this movement to the racket, and 2) Acceleration of the racket along the stroke by reduction of the radius of rotation.

The two elements were tested on physical models made of household items. This made an in-depth study of the stroke simple using a regular camera and basic software applications. Similarity between these physical models and players was obvious. Clips of professional players' strokes were examined again. This time the purpose was to confirm that an efficient stroke is a result of the two elements mentioned above, and that a lack of either of them leads to a degradation of a stroke.

Based on these two elements of a tennis stroke, it became possible for the first time to explain the outstanding backhand stroke of Rafael Nadal. In a move completely unique to Nadal, this stroke is a result of a momentary reduction in shoulder width that leads to rocket acceleration.

Results: The tests confirmed the assumption that all fast strokes are a result of a proper initiation of a stroke followed by acceleration of the racket.

Discussion and Conclusions: Mastering the tennis stroke based on two elements holds a significant value for players and coaches alike. These two elements are initiation of a tennis stroke in the player's upper torso, and transfer of rotation to the player's wrist holding the tennis racket, and acceleration of rotation by reduction of the radius of rotation along the path. The elements of the stroke can be easily explained to the students. The stroke can be custom tailored for each player according to his or her physique

and build, rather than imitating movements of other players, as is commonly practiced today. These same elements can be identified in other sports as well and lead to better technique and, accordingly, better results.

Student Teachers Planning Skills – Comparing Computer-Assisted Learning with Traditional Face-to-Face Learning

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The aim of the research was to compare the planning skills of student teachers who studied according to the computer-assisted learning approach with those of student teachers who studied according to the traditional face-to-face learning approach.

Participants were second year student teachers. They submitted a unit plan and two lesson plans in one of the following four subjects: volleyball, football, basketball, and gymnastics. Instruments included an evaluation of the unit and the lesson plans.

Ten traditional and seven computerized unit plans, along with 17 traditional and 20 computerized lesson plans, were evaluated by two separate, independent reviewers. Results clearly pointed to an advantage towards the computer-assisted learning approach over the traditional one. We concluded that learning in a computer-assisted learning approach provides wide exposure of teaching materials to the student teachers. In addition, working in a group demands cooperation and makes one's efforts and products public, which enhances motivation for better preparation and therefore produces a higher quality of planning.

Abdominal Training versus Core Conditioning – How Is This Topic Related to Abdominal Hollowing and Abdominal Bracing?

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The ultimate goal of this presentation, which will later be applied in a practical workshop, is to improve common abdominal exercises by making them safer, goal-specific oriented and more effective.

No single ultimate abdominal exercise can suit all four abdominal muscles ,and no one exercise can provide an appropriate response for the variety of objectives generally indicated for Ab exercises. This was emphasized by McGill (2004) in his criticism of the most popular traditional sit-up exercises, and as a basic guideline for abdominal training. 'Exercises like sit-ups, causing substantial loads on the lumbar spine, should be re-evaluated, if the goal is prophylactic, seeking ways to improve athletic performance or functional daily activities while protecting their backs" (McGill 2007).

Changes in programming abdominal exercises depend largely on the perception that they are functionally multi-dimensional and that they co-activate with back muscles, both in an inner and outer unit. The two units are functionally integrated to create a central muscular system, known as the core.

Core conditioning, the focus of this lecture, goes far beyond curl-ups, sit-ups and other conventional abdominal exercises. Core conditioning is an accepted, integrated approach to abdominal and back training. Misconceptions about it abound, leading to unjustified controversies.

To better clarify the **core** concept and its application to practice, the following points will be discussed:The difference between abdominal training and core conditioning Hollowing and Ab. Bracing and how they fit into the above topic Evidence-based principles leading to practical guidelines

False-Performance Feedback Does Not Affect Punching Forces and Pacing of Elite Boxers

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Prior research indicates that providing participants with positive augmented feedback tends to enhance motor learning and performance, whereas the opposite occurs with negative feedback. However, the majority of studies were conducted with untrained participants performing unfamiliar motor tasks, and so it remains unclear if elite athletes completing familiar tasks respond in a similar fashion. Thus, this study investigated the effects of three different versions of false-performance feedback on punching force (N), pacing (force over time) and ratings of perceived exertion (RPE) in 15 elite amateur male boxers. Athletes completed a simulated boxing bout consisting of three rounds with 84 maximal effort punches delivered to a punching integrator on four separate days. Day one was a familiarization session in which no feedback was provided. In the following three days, athletes randomly received false-positive, false-negative and false-neutral feedback on their punching performance between each round. No statistical or meaningful differences were observed in punching forces, pacing or RPE between conditions (P 0.05; ≤ 2%). These null results, which differ from previous literature, could stem from the elite status of the athletes involved, indicating that task proficiency might mitigate against changes in performance and pacing variability when feedback is manipulated.

Resist Aging with Resistance Training

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As people age they tend to reduce their voluntary activity, which may result in a concomitant decline in muscle strength, muscle size and function, a phenomenon known as Sarcopenia. Preserving muscle mass and function is fundamental for maintaining the ability to perform Activities of Daily Living (ADL).

Resistance training is a well-documented means for preserving muscle mass and function in a wide variety of ages in healthy and clinical populations. The specific dose responses for preserving muscle mass and function is still unclear. Moreover, the complexity of the age related health issues emphasize the need to tailor a specific resistance training program.

In the last two decades, there has been a large and growing research about Sarcopenia and ways for its prevention. This research provides some useful information about the doses, tools, and resistance program framework to induce muscle mass and function (movement velocity, type of construction, blood flow restriction, etc.).

In the presentation, the ambiguity surrounding Sarcopenia and resistance training will be clarified, information about different intervention programs will be discussed, and some useful tools will be suggested for professional health care providers.

Training Outstanding Students at the Academic College at Wingate: The Students' Perspective

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Background: The Israeli education system has been undergoing continuous reforms aimed at improving the quality of learning and the achievements of learners. In the past two decades, reports and surveys have shown a steady decline in the level of knowledge and success that pupils demonstrated on various tests. In order to meet the need for quality manpower to push the faltering wagon up the hill, in 1999 the Ministry of Education launched a new program called REGEV – 'a great leader in teaching'. The main goal of the program was to encourage outstanding students to become teachers and serve as educational and managerial leaders (Libman, 2014). The program gradually entered all colleges of education in Israel, and in 2013 opened its first class at the Academic College at Wingate, which trains physical education teachers.

Aims: The present study is aimed at examining the graduates' satisfaction with their studies at this unique framework of the REGEV program, their integration into teaching in the formal education system, and their attitudes towards further academic studies and professional development.

Method: Participants include 36 students who graduated from the REGEV program between 2015 and 2017, and 64 of their colleagues who graduated from the standard program at the same period. A questionnaire was developed using both a Likert scale and open-ended items, and validated by three experts in the field. The questionnaire was administrated to a group of 14 students who are currently having their second year in the REGEV program. Each participant was personally interviewed by phone. As part of this presentation, only the results of the interview phase and its conclusions will be reported.

Results: The findings show a high level of satisfaction among the students regarding their experiences. The respondents mainly evaluated the unique curriculum, the learning in a small, high-quality group, and the personal guidance and care of the academic and administrative staff. Still, a few respondents expressed disappointment with the specific training in sports. However, and most surprising, the economic benefits granted to the students were not placed with high importance when considering the main contribution of the program. Most of the participants declared that they intend to work in the public education system when graduating.

Discussion and Conclusions: The REGEV program at the Academic College

at Wingate is well in line with the vision of its original developers. From the students' perspective, the program is successful in attracting highly talented candidates, providing them with influential training, and contributing to their personal and professional development.

Laboratory Anaerobic Performance in Elite Czech Ice Hockey Players: Normative Data for Players Aged 14 to 35 Years

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Background: From physiological assessments, anaerobic exercise testing is of primary importance in ice hockey players. From various anaerobic tests, the anaerobic all-out Wingate test (WAnT) had been adopted and standardized for ice hockey player testing (Cox et al. 1995). Although the WAnT is frequently used worldwide with ice hockey players, there are no available data on normative values for peak power (PP) and anaerobic capacity (AnC) in regards to the age of the players.

Aim: The aim of this study was to analyze data from 17,598 Wingate tests of Czech ice hockey players (forwards and defensemen) obtained in preseason testing from a 20-year period to create age-related norms for PP and AnC in ice hockey players.

Methods: The data were collected from the 1999 to 2017 seasons. Altogether 17,598 ice hockey players aged 14 to 35 years (members of teams of elite league of cadets and junior and senior players) completed a 30-second WAnT on a cycle ergometer Monark E824 using a breaking force of 6 $W.kg^{-1}$ that equals 0.106 $kg.kg^{-1}$. The main results were 5-s absolute and relative PP [W, $W.kg^{-1}$] and total work or anaerobic capacity AnC [$J.kg^{-1}$]. The dependence of PP and/or AnC on age was calculated using a polynomial function of the third order. Peak values were calculated using second derivation of the function.

Results: Absolute PP [W] = $0.1029x^3 - 10.42x^2 + 332.02x - 2071.9$ (R^2= 0.9915, x= age, years), with peak values 1325.12 W at 25.8 years of age, and relative PP [$W.kg^{-1}$] = $0.0008x^3 - 0.0717x^2 + 2.1046x - 4.7443$ (R^2= 0.9621), with peak values 15.01 $W.kg^{-1}$ at 23.4 years of age. Absolute AnC [kJ] = $0.0024x^3 - 0.2271x^2 + 6.6956x + 38.778$ (R^2= 0.9944, x= age, years), with peak values 30.49 kJ at 25.6 years of age, relative AnC [$J.kg^{-1}$] = $0.013x^3 - 1.1472x^2 + 31.613x + 68.936$ (R^2= 0.9619), with peak values 347.13 $J.kg^{-1}$ at 21.9 years of age. Fatigue index FI [%] = $0.0041x^3 - 0.3509x^2 + 9.7539x - 45.906$ (R^2= 0.9586), with peak values 43.12 % at 24.4 years of age.

Discussion and Conclusions: Anaerobic performance indices in young elite ice hockey players increase with age, and absolute values of PP and AnC are peaking at the age of 25-26 years, whereas relative values are peaking earlier at 22-23 year of age. The normative values could be used by coaches and

trainers to evaluate anaerobic peak power and anaerobic capacity with respect to the chronological age and may serve in players' selection and monitoring training interventions.

Age in the Eyes of the Beholder – Ageism in Gyms

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Our presentation discusses the issue of old-age and ageism in the context of gyms in Israel. It strives to contribute to the approach that questions 'old-age' as having a self-evident existence. Ageism is perceived as contempt, hostility, patronizing and fear towards older people, based on age as determining social image, identity and status. The gym's framework serves as a convenient sphere for examining the phenomenon of ageism because of the physical, bodily characteristics that are prominent in this social surrounding. The analysis suggests that 'old-age' is perceived as threatening but also as challenging. Fitness activity and the persistence involved in it are perceived by the trainers and trainees, of all ages, as signaling the distancing from physical fragility (and end of life) but also as a way of overcoming it.

The paper is based on an anthropological study in two gyms in Tel Aviv and in one gym in a suburban region. It was carried out by participant observations and conversations with male and female trainees and trainers in the studied gyms. Both authors, who are notably different, in terms of gender, age and involvement in sports activity, also base the analysis on personal training experience. The findings revealed that the trainers' and trainees' attitude toward the older trainees shifts from consideration and encouragement to contempt, despise and disregard. However, a 'regular' attitude toward the older trainees, similar to the one toward other trainees, was also noticed. Expressions of reservation, distance and exclusion are neither definite nor inclusive in all the studied gyms. Furthermore, noteworthy differences were found, depending on the contexts and situations, on the sites and times of activity, and the trainers, the trainees, the kind of activity, ownership, etc.

Rio 2016: Between National and Olympic Challenges

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Background: On a large scale, the Olympics are appreciated as a source of positive energy. Yet, questions are raised about the required investments, governance and legacy promises. Against this background a team of Dutch researchers and experts documented the scientific information on the proceedings and societal impact of the 2016 Games, both on Brazilian and Dutch society. This study resulted in a book publication which was placed in the Olympic World Library by the IOC.

Aims: This project intends to bring the scientific literature on the 2016 Games to the fore, help understand what is going on in the field of Olympics and raise the quality of the debate.

Methods: The following methods were applied: study of scientific literature, online data collection (national surveys of the Dutch population), secondary data analysis and semi-structured interviews.

Results: The investments in accommodations and infrastructure are estimated at 14.4 billion euro, financed with 62 per cent public means. The operational costs for the organization of the Games are estimated at 2.7 billion euro, solely privately financed. Rio 2016 disclosed that it was a challenge to use the investments for the Games for broader legacy planning (Barbassa, 2015; Zimbalist, 2015; Boykoff & Mascarenhas, 2016). Millions of Brazilians protested in hundreds of cities against the huge public costs of mega-sport events (Horne & Whannel, 2016). The aim was to use the momentum of the 2016 Games as a stimulus for creating a positive legacy in terms of accommodations, infrastructure, environment, sport participation and social cohesion. Not all of the legacy goals were realized. The Games and the created legacy served in particular the interests of the elite (Klarberg & Olsson, 2014; Segrave et al., 2016).

Discussion: The results disclosed that the 2016 Games appealed to millions of sport enthusiasts in Brazil and abroad and that a substantial sum of tax payers' money was involved which could have been spent on healthcare, education and crime prevention. Both event and legacy planning were highly influenced by economic and political developments in Brazil. The city of Rio de Janeiro won the right to hold the event in what was the best time for Brazil in 50 years having to deliver it in the most complicated time during the past 50 years

(Financial Times, 2016).

Conclusion: The 2016 Games were relatively well organized. Planning and realization of the intended legacy turned out to be challenging to put in practice, especially given the economic and political circumstances. Possible future steps for the IOC are to further change the balance between requirements for the event and desirable investments for the development of the host city and to expand its task as a partner as regards event organization and legacy planning.

Perceptual Changes of the Woman's Body from the 19th to the 20th Century

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Background: When we look at paintings from the 19th and 20th centuries we cannot ignore the evolution of painting, and if we focus on the portrayal of the woman's body the differences and the evolution are prominent. With the birth of photography at the end of the 19th century and its development during the 20th century we can also identify the changes in how the woman's body is portrayed.

Aims: As a professional dancer in the past and a dance and movement teacher for many years, I have always been interested by the woman's body and the body image. The aim of this study is to examine the transformation of the female dancer's body through the exploration of her depiction in art.

Method: In an attempt to address these issues, this exploratory study examined artifacts produced in the 19th and 20th centuries by society, media, and visual arts and their influence on the woman's body image. It further examined the relations between the different techniques of dance and the female dancer's body portrayal. A deeper view into the paintings and photos of the 19th and 20th centuries through the eyes of painters and photographers from different periods in history reveals distinct views of the woman's body.

Discussion and Conclusions: Dance and women dancers, in particular, have always been a subject for painters and photographers. Art, in general, and especially painting and photography have an important role in the perception of the woman's body. At the same time, the evolution and development of new dance techniques in the 20th and 21st centuries have also impacted this perception. As such, the inter-relationship of art and dance has both reflected and at the same time shaped society's view of the woman's body. Many questions remain to be addressed about the evolution of the woman's body in the 21st century and the role of society in this evolution.

Testing the Hypothesis that Exercise Interferes with Drug Actions

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The traditional focus of exercise scientists studying the interaction of drugs and exercise has been on the effects of drugs on exercise performance or functional capacity. In contrast, there is limited information available about the effects of exercise on the efficacy of drugs that have been prescribed and ingested for therapeutic reasons. Those requesting the approval of the manufacture, distribution and sale of new drugs to the public are required to submit evidence of drug effectiveness and safety to drug regulatory bodies. But, there is no associated requirement to include evidence of the interactions of exercise with drugs. However, the physiological adaptations to acute and chronic exercise are such that there is good reason to suspect that exercise has the potential to significantly influence drug absorption and bioavailability, drug distribution within the body, and drug elimination from the body. This presentation will provide the conceptual framework for the hypothesis that acute and chronic physical exertion, such as that experienced by military personnel during operations and training, are associated with physiological adaptations that may interfere with desired drug effects. A proposal for the efficient testing of the hypothesis will be presented.

Left Ventricular Assist Device – A Bridge to Life

Tamir Kamerman

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Heart failure is a common disease, the incidence of which increases with age. Due to the increase in life expectancy, the incidence of heart failure is increasing and is expected to increase over the next few years. Among patients with HF, there is a group of patients who suffer from such a severe degree of heart failure, and whose life expectancy is very short, that the preferred solution for them is a heart transplantation. In the light of the current reality, in which the number of heart donations each year is small, it is clear that this solution does not meet the need. One of the common solutions for patients who deteriorate in terms of heart function while waiting for a transplant is to connect them to an artificial pump that supports the left ventricle of the heart– an LVAD (Left Ventricular Assist Device).

A shortage of donor organs combined with the efficacy of mechanical circulatory support has resulted in the expanding application of LVAD to bridge patients to heart transplantation or to destination therapy. Is physical training, as recommended to heart failure patients, also recommended for this group of patients?

The Effect of a Single Bout of Balance and Coordination Exercise on Learning and Memory of Young Adults

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Background: A single bout of physical activity was found to improve executive functions, attention, cognitive speed and episodic memory. Balance and coordination exercises are known to involve activation of the cerebellum, which influences attention, working memory, and verbal learning and memory.

Aim: To assess the influence of a single bout of balance and coordination exercise on learning and memory of young adults.

Methods: Sixteen physically active young adults (age = 28±2.61 yr) performed six appointments in two conditions: a PA intervention, or control condition (watching a silent film) for 25 min, which was followed by an exam on one of two subjects: dolphins or chocolate. Then they were presented with an informative video about the subject, and examined on it. Twenty-four hours and two weeks later, they performed two more exams about the subject. In the second phase they were presented with and examined on the second informative video in the second condition.

Results: Two weeks following the exposure to the informative video, the participants had a significantly higher total score in the PA phase in comparison to their performance two weeks following exposure to the informative video in the control condition. The interaction time X condition was found to be significant ($F_{3,48}$=7.65; p.01), implying a positive effect of PA on the retention phase.

Discussion: The results of the study show that a single bout of PA comprising 25 minutes of balance and coordination exercises had a clear advantage in the participants' ability to retain information from an instructional video presented after the PA intervention. Importantly, the most robust effect of the PA was on performance at two weeks post-training.

Conclusion: The present findings point to a positive effect of balance and coordination exercises on retaining declarative long-term memory. Based upon this, these findings could be used to encourage the performance of balance and coordination exercises prior to learning new declarative information.

Athletes in Transition: German Immigrants to Mandatory Palestine: Between Integration and Segregation

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The Brit Maccabim Atid sports club was founded by immigrants from Germany who came to Palestine during the 1930s. The circumstances surrounding this organization's establishment differed from those of the sports organizations operating in Palestine until then. We considered sports culture as a tool for analyzing immigrant absorption processes. Our discussion is based on the claim that sports served as a means of social integration for German Jews. In Palestine, sports served as an arena of conflict between the political camps in the Jewish settlement. In response to this political reality, immigrants from Central Europe began organizing to establish separate sports clubs along political and ethnic lines, thus responding to the needs of immigrants identifying with German cultural circles. Brit Maccabim Atid constitutes a test case for the social and cultural changes in the meaning of sports in the move from one country to another. The paper describes two sociological models, each of which examines the impact of involvement in sports on the extent to which immigrants become integrated into society. Our findings indicate that sports participation in an immigrant society can be a unifying and assimilative factor and at the same time a segregating factor.

Physiological Effects of Exercise with Aging

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Background: Exercise is an important factor for optimizing overall health and preventing chronic diseases.

Aim: Our aim was to examine the effects of voluntary exercise on old rats' bone marrow by measuring physiological and molecular variables following exercise stimulation.

Results: We found that voluntary exercise speed and endurance are reduced with aging. The in vitro results displayed an enhanced proliferating and differentiating rate of bone marrow cells.

Discussion and Conclusion: When transplanting the exercise-stimulated marrow of old rats into an ectopic model of Demineralized Bone Matrix, we find newly formed blood vessels within the graft in excess of the sedentary old marrow transplanted to a similar ectopic model. Tissue repair and perfusion are improved when exercise marrow is transplanted to the ischemic limb of donor rats. The number of transplanted cells that survived in the ischemic limb was higher when stimulated by exercise. Bone marrow stimulated by exercise exhibits differential gene expression that is involved in glucose and lipids metabolism, bone formation, angiogenesis, and inflammation. Our data highlight the importance of exercise in aging animals.

Effectiveness of Field-Based Resistance Training Protocols on Hip Muscle Strength among Young Elite Football Players: A Randomized Controlled Trial

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Background: Sport-related groin injury is a frequent clinical condition found in footballers. Current evidence on the effect of training protocols on groin injuries is limited, and further randomized controlled trials are needed.

Aim: To examine the effects of an eight-week progressive resistance training program on hip joint muscle strength measures, using the Copenhagen adduction (CA) and the sliding hip (SH) exercises.

Methods: Forty-two young male football athletes (age 17.5±1.1 years; height 178.3±3.2 cm; body mass 66.1±8.6 kg) participated in the study. A randomized controlled trial design was used. Players were randomized into a group performing two sessions per week of CA, a group performing two sessions per week of SH or a control group. Players performed maximal eccentric strength tests for both the hip adductor (EHAD) and hip abductor (EHAB) muscles.

Results: The CA group had a significant strength increase in the right and left leg (d = 2.11, d = 1.9, respectively). The SH group also had a significant strength increase in the right and left leg (d = 1.68 and d = 1.67, respectively). The CA group presented EHAD/EHAB improvements in the right and left leg (d = 0.84 and d = 1.14, respectively). The SH group also presented EHAD/EHAB improvements in the right and left leg (d = 1.34 and d = 1.44, respectively).

Conclusion: Both the CA and SH protocols were effective in inducing significant improvements on EHAD, EHAB and EHAD/EHAB ratio when compared to the control group. Practitioners should be aware of the training effectiveness of both protocols.

Professionalization in Progress: Police Use of Force Self-Defense Training in Germany

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Background: In order to equip police officers with operational skills, the police use of force (PUOF) training plays a key role. While the situation of PUOF in Germany has hardly been investigated to this day, national (Jaeger et al., 2013) and international (Renden et al., 2015) data indicate problems of transfer between training and the criterion environment. The causes are mainly seen in lack of time resources as well as in questionable contents. In addition, pedagogical aspects of training design have recently been brought into a closer view following the paradigm of nonlinear pedagogy (Körner & Staller, 2017).

Aim: Against this background, the contribution presents first empirical data on the situation of PUOF self-defense training in Germany. The focus is on a) the temporal structure of the training, operationalized as the ratio of physical activity and passivity of the participants (time issue); b) the content of the training (system issue); and c) the role of pedagogy as taken from the view of PUOF coaches (pedagogy issue).

Methods: A total of 30 consecutive hours of PUOF training at the Hessian police (N= 24 participants) was observed over a period of five weeks accompanied by semi-structured interviews with PUOF coaches (N = 8). Data were analyzed using qualitative content analysis (Kuckartz, 2014).

Results: Initial data suggest that (i) POUF self-defense training is less representative (system issue) in terms of the requirements of the criterion environment and (ii) offers untapped potential for increasing participant activity and interaction within the available time frame (time issue); (iii)

Pedagogy is considered by POUF coaches as an important resource, while being structurally and practically neglected within their education (pedagogy issue).

Discussion and Conclusion: Based on the results, the presentation recommends (i) the implementation of the representative learning design model for PUOF training and (ii) highlights the hitherto under-researched importance of high-quality partner interactions within the available time frame. Finally, (iii) the role of pedagogy is being embedded and discussed in a broader context of the professionalization of PUOF self-defense training in Germany.

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The Influence of the Coach's Halftime Talk on Players' Performance

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Understanding the influence of coaches on the feelings, thoughts, and behaviors of the teams they lead may not only help in developing effective ways of encouraging within-team communication, but also in influencing the teams' performance. The current study aimed at examining the influence of the coach's halftime talk on players' performance. The study followed a mixed-methods design. Participants were nine basketball players from the top men's elite league in Israel, the team coach, and two assistant coaches. The qualitative approach included observation sheets on behaviors that occurred during the coach's halftime talk, which was also filmed. In the quantitative part, the coach's halftime talks were analyzed into several categories. Each category was coded according to the number of times it was repeated in the coach's talks. Seventeen films of halftime talks were analyzed and categorized into main themes. ANOVA and t-tests were applied. The results demonstrated specific patterns of coaches' talks that were mainly related to the balance of points achieved by the team until halftime. For example, when the team arrived at halftime with a negative balance, a large number of negative feedbacks in the coach's talk increased the likelihood of losing the game.

School Engagement, Academic Self-Concept, Parental Support, and Academic Readiness in Finnish Adolescent Athletes and Non-Athletes

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Background: In Scandinavian countries adolescent athletes are expected not only to combine education with sports, but also to succeed in school to facilitate future study options. While athletes recognize the importance of education, still most tend to invest greater amounts of energy and time in sport than education. A simultaneous investment in both sports and school, Dual Career (DC), is demanding. (O´Neill, Allen, & Calder, 2013). Previous DC studies have mainly focused on adolescent athletes´ development in the sport context. However, in education research targeting non-athletes, there has been a growing interest in the association between psychoeducational factors, including academic self-concept and motivation for learning, and academic success. Further, school engagement has been found to be a vital factor among non-athletes as it affects academic self-concept and academic success. According to Bronfenbrenner´s Bioecological Theory an individual's school engagement develops in the interplay between environmental and personal factors (Bronfenbrenner, 1975; 1979).

Aims: The existing body of education research hints that academic self-concept, academic preparedness, school engagement and family support are associated with one another and that these relationships could be bidirectional. Therefore, this study aims to determine how academic readiness, academic self-concept and parental support for learning are related to school engagement in athletes and non-athletes.

Methods: This study draws on data collected in connection to a new Finnish national Dual Career project. Athletes (N=311) and non-athletes (N=290) from 15 sports-oriented lower secondary schools answered self-report questionnaires at the beginning of 7th grade. A multigroup structural equation modeling (SEM) was applied to explore measurement invariance within factors and between athletes and non-athletes in academic preparedness, academic self-concept, and family support for learning in school, in relation to school engagement.

Results: The results showed that school engagement was positively associated with academic self-concept, family support for learning and academic readiness

among athletes and non-athletes. Furthermore, academic self-concept partly mediated the effects of academic readiness on school engagement in both groups. Finally, athletes had higher perceived academic readiness and parental support for learning in lower secondary school than non-athletes.

Discussion and Conclusions: According to the results, athletes had higher perceived academic readiness and parental support for learning than non-athletes at the beginning of 7th grade. Similar associations were found between school engagement and academic self-concept as well as family support for learning among athletes and non-athletes. In sum, athletes are as prepared and engaged in school as their non-athlete counterparts. However, declining figures in school engagement during lower secondary school is a well-known phenomenon in the Western world. Therefore, parents of young athletes should be aware of their vital role as motivators for school as the demands of sport and school increase in middle adolescence.

The Winter Olympic Games in Pyeongchang – A Step to National Unification? Korean Hopes and German Experience

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The Olympic Winter Games in Pyeongchang in February 2018 have once again placed the political situation in divided Korea in the center of international attention. In the region, there are extreme tensions. Even the participation of the North Korean athletes was not certain up to the last minute. As a consequence of the Second World War and the systemic dispute between the great powers of the USA and the Soviet Union ('Cold War') there were several countries which took part in the Olympic Games with two competing teams. Germany, which despite the division, from 1956 to 1964 initially still went to the start with a united team, was until 1988 in Seoul also represented by teams of the Federal Republic of Germany (FRG) and the German Democratic Republic (GDR). Various attempts were made to form a unified Korean team or at least to unite both teams at Olympic Games, in order to promote the creation of trust between the two hostile neighbors. The symbolic acts at the Winter Olympic Games in 2018 should not be overestimated. Also the influence of the united German Olympic team on the feeling of togetherness of people in both parts of Germany was relatively slight. It was, above all, economic factors which led the process of reunification to its conclusion – not sport.

Physical Activity and Weight Loss: Quality versus Quantity

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The prevalence of obesity is increasing worldwide, and physical activity is considered a therapeutic tool. BMI and total adiposity are positively correlated with cardiometabolic disease risk at the population level. However, body fat distribution and an impaired adipose tissue function, rather than total fat mass, better predict insulin resistance and related complications at the individual level.

The lecture will discuss the contribution of physical activity to weight loss, and how to maximize fat loss while preserving lean tissue mass and function as a central goal of obesity treatments. Exercise imposes a mechanical load on skeletal muscles, and as such, it is often viewed as a way to reduce losses of FFM with dieting.

In addition, we will discuss various phenotypes of obesity, including excess body fat in obese and normal-weight subjects and the benefits of physical activity in reducing visceral fat, and maintaining lean body mass, and the importance of regular exercise as a strategy for weight loss maintenance.

Male Dominance Under Threat: Machoism Confronts Female Defiance in Israeli Gyms

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This study discusses macho culture in Israeli gyms. It describes male trainees' efforts to preserve their dominance, facing female trainees' threat to undermine it. The article analyzes means, such as military icons, physical battles and vocal expressions, used to convey male dominance at the gym. The research approach of this study is based on Grounded Theory, according to which theoretical arguments are derived from data collected by observations, interviews, and document analysis. Two gyms in the metropolis of Tel Aviv were studied by the male researcher for three years and one suburban gym was studied by the female researcher for a year. Being researchers and trainees from both genders introduced a unique perspective of gender power relations at the gym. The different socio-geographic backgrounds of the studied gyms offered a refreshing understanding of the impact of specific circumstances on gender dominance. The analysis suggests that males' hegemony can be threatened by potential women's dominance, as the ethnography on the Tel Aviv gyms reveals. Although men are struggling forcefully to preserve their dominance over 'male territory' at urban gyms, women's gradual penetration into the perceived masculine space destabilizes it.

Running between the Raindrops: Running Marathons and the Potential to Put Marriage in Jeopardy

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For many amateur long-distance runners, the marathon is not merely an event – it is a demanding activity, both physically and mentally, that obliges them to enter the running social world and undergo a process of identity transformation. This process encompasses immersion into a 'zone' that is often outside the partnership of marriage, and includes absorption into social networks that are unlimited in time and place. An ethnographic research design was utilized, using a combination of participant observation, interviews, and website analysis. The key findings illustrate both the complexity and the fragility regarding the encouragement of the non-running partner towards his/her running partner. It is argued that even if the partner is supportive, embracing a marathon identity might jeopardize the marriage. In other words, a partnership may crumble due to the identity transformation of one of the partners when the other doesn't play an active part in the new social world.

Turn Left at the End of the World: Israeli Periphery in Sport Films

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Sport films are defined as such for their preoccupation with competitions, athletes, fandom or other related sports aspects. However, they largely address other social issues, which are amplified through sports, constituted as one of the most popular expressions of modern culture. The American sport film industry, often addresses topics such as racism, gender, capitalism and so forth, while Israeli sport films usually focus on politics, culture, and the periphery. The research which resulted in this lecture concentrated on the latter – film representations of the Israeli spatial and social periphery. The aim of the research was to analyze the dominant images and themes in sport films. For this purpose, eight films were chosen, of which the plot takes place in an Israeli peripheral town. Because the research dealt with the cinematic narrative and not contemporary reality, the towns presented in the films are either real or fictional. The research included qualitative analysis of the films. The criteria constructed from the analysis lead to three major themes: crime and poverty as a contemporary aspect of the periphery; sport as a 'great equalizer'; ethnicity in the periphery. The findings suggest that towns and the local communities are often displayed negatively, while sport is presented as a means, real or hypothetical, for social change. Likewise, the films repeatedly focus on the human surrounding, people and communities and their attitude toward sport as an integration tool.

How Do Your Muscles and Bones Know You Have Been to the Gym? A Short Introduction to Cellular Mechanotransduction

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The many benefits of physical activity are well known but the cellular mechanism leading to these physiological changes are still being revealed. The idea that mechanical signals can cause changes to the activity of biological tissues was suggested more than a century ago, and technological progress made in the past 20 years enables the testing of this hypothesis.

A growing body of evidence shows that mechanical cues transmitted from the environment to the cell or generated within the cell itself may alter its activity. These changes can be local, with proteins embedded in the plasma membrane, or be global, and affect gene expression.

Gaining understanding on cellular mechanotransduction continues to enhance our understanding of the ways physical activity affects molecular processes at the cell level and will allow adjusting training methods to various conditions such as aging, rehabilitation after injury, and more.

Acute Whole Body Exercise Increases the Availability of Doxorubicin in the Plasma Post-Injection

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Doxorubicin (DOX) is one of the most widely used chemotherapeutic agents prescribed in the treatment of solid tumors and hematological malignancies and its cardiotoxic side effects are well documented. However, the effects of DOX on skeletal muscle are not well understood and recently our laboratory demonstrated that post-injection, skeletal muscle sequesters DOX out of the plasma, decreasing its availability at the tumour. Therefore, the purpose of the present study was to determine whether exercise performed 24 hours following the administration of DOX would result in an increase in the amount of DOX available in the plasma. Male Sprague-Dawley rats (n = 12) were injected intraperitoneally with a 4.5 mg/kg dose of Dox and then randomly assigned to either a control group (n=6, no exercise) or an exercise group (n=6). Twenty-four hours later the exercise group underwent a 60-minute swimming protocol and all animals were subsequently sacrificed and blood samples collected. There was is a significant increase in the plasma concentration of DOX (108±12 nM) post-exercise as compared to control (39±14 nM). In contrast, there were no significant differences between groups (Control = 10±3 nM, Exercise = 12±2 nM) in the plasma concentration of doxorubicinol (the breakdown and excretion product of DOX). These data clearly show that a single bout of whole body exercise results in elevated plasma DOX concentrations and it is postulated that the release of Dox from exercising muscle most likely accounts for this increase. These findings are also of clinical therapeutic importance as exercise may be used to increase the effectiveness of DOX in the chemotherapy treatment regimen.

Motivation and Personality Traits of Students in Kinesiology: Similarities and Differences between Male and Female Students

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Background: The strength of motivation, as well as personality traits, are essential determinants of people's behavior. The level of motivation will only point to the strength of focus in achieving the projected activity. Personality represents those characteristics of the person that account for consistent patterns of behavior. Four factors influence how we respond to any given situation: our genetic make-up, our past experience, the nature of the situation in which we find ourselves and our free will. Eysenck et al (1982) proposed that people high in extroversion and psychoticism tend to have pro-sport attitudes. This is because personality is primarily determined by genetics.

Aim: The research was conducted with the aim of establishing the characteristics of motivation and the personality traits of male and female students of kinesiology and possible differences in the appearance of the same.

Methods: Three tests were conducted: General achievement motivation (Havelka & Lazarević), Sports achievement motivation (Havelka & Lazarevic,) and Eysenck's EPQ. The study included a sample of 64 male students and 86 female students. Data processing, descriptive statistics as well as variance analysis were performed using statistical statistics package Statistica 13 (TIBCO Software Inc., 2017; Statistica, data analysis software system, version 13. http://statistica.io.).

Results: The obtained data present male students (M=12.58; SD=5.5 (M=mean; SD= standard deviation)) scoring significantly higher on the general scale (p .00) than female ones (M=10.37; SD=4.52). Male students (M=13.56; SD=4.68) also appear to be significantly more motivated than female athletes (M=11.56; SD=4.32) when it comes to sports achievement (p .01). Male students were presented as an emotionally more stable sample, projecting statistically significantly more strongly on scales of positive emotional responses to both general and sports achievement. At the same time, male students showed lower projections on scales of negative emotional responses to the motives of general and sports achievement, as well as on the scale of neuroticism at EPQ. Female students (M=16.27; SD=3.36) were presented as statistically significantly stronger projected on the extraversion scale than male students

(M=15.08; SD=3.75) (p .05).

Discussion and Conclusion: The investigated sample points to similar relationships between the male and female population involved in physical activity compared to the research so far carried out. The only specific feature found among women students in the examined sample is a significantly higher-level of extraversion than male students.

Differences in Transfer Factor of the Lung between Rest and after Maximal Exercise in Croatian Junior and Senior Rowers

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Background: Aerobic capacity is of decisive importance for cyclic physical activities lasting longer than three minutes. Rowing is a particularly demanding activity because it is exactly the aerobic lung capacity that is the most important in performing that activity. Aerobic capacity depends on age, sex, genetic factors and, what is of particular importance, professionally guided training. The test of maximal possible reception of oxygen is considered to be the best test giving relatively reliable information about maximal aerobic capacity.

Aim: The aim of this paper is to determine the change of diffusing lung capacity for carbon monoxide (DLco) of Croatian rowers at progressive exercise on a rower's ergometer.

Method: The research included 91 rowers (45 seniors; 46 juniors). Ergometric tests were performed on a rowing ergometer 'Concept II' model C (Morrisville, Vermont, U.S.A.). Diffusing lung capacity for CO (DLco) and unit diffusion (DLco/Va) were measured at rest and after maximal exercise using the multifunctional apparatus 'Master Lab' (Jaeger Company). Diffusing lung capacity was measured by the 'single breath method'. Because of the great influence of the alveolar volume on the measured values of DLco (DLco progressively decreases by the reduction of Va to the level of the functional residual capacity), a correction of diffusing capacity to alveolar volume has been suggested and is termed unit diffusion or Krogh constant (KCO). Values after Cotes have been taken as normal values for diffusing capacity. The results were statistically processed by analysis of variance with the level of significance p.05.

Results: The two samples were statistically significantly different in the three variables: age, body height and body weight as expected. The values of diffusing lung capacity at rest were 21.93±3.23 mmol/min KPa for juniors and 23.56±4.73 mmol/min KPa for seniors (p.05). Unit diffusion at rest was 2.41±0.30 mmol/min KPa L for juniors and 2.27±0.43 mmol/min KPa L for seniors (p.05). At the end of testing, after maximal effort, the values increased significantly by 1.2 times in both rowing patterns. Diffusing lung capacity for juniors was 26.04±3.31 (194.45±27.19% predicted) and for seniors 28.43±5.43 mmol/min

KPa (208.54±39.14% predicted). Seniors have statistically significantly higher diffusing capacity (p.01) as well as predicted value (p .05). However, when the values of diffusion capacity are corrected for alveolar volume, no statistically significant difference between the two samples was found.

Discussion and Conclusion: In top athletes at rest DLco as well as DLco/Va are increased compared to standard norms after Cotes. Differences in diffusion capacity among rowers of different ages can be partially explained by considerably higher body height as well as by the associated larger alveolar surface.

Characteristics of Motor Unit Recruitment in Boys and Men at Maximal and Submaximal Force Levels

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Background: It has been proposed that motor unit recruitment may differ between boys and men. A lower voluntary activation level (VA) has been frequently reported in prepubertal children than in adults during maximal efforts, although it does not seem to be the case at the muscle length maximizing force production, i.e optimal muscle length. Conversely, no study has compared prepubertal children and men at submaximal force levels, where the low musculotendinous stiffness and the potential resulting tendon slack may affect the neural strategies in children. Specifically, VA could be higher in children at low force levels to take up the tendon slack.

Aims: The aim of the present study was to compare VA difference between boys and men at different contraction levels of the knee extensor muscles. We hypothesized that (i) prepubertal boys would display a higher VA than men at low force levels because of their lower musculotendinous stiffness. and (ii) Boys' and mens' VA differences may result in differences of motor unit recruitment.

Methods: Fourteen boys (9-11 years) and 15 men (18-30 years) were tested at the optimal knee angle (i.e. maximal torque development). For both groups, VA was assessed using the twitch interpolation technique during maximal (MVC) and submaximal (20, 30, 50, 70, 80, 90% of MVC) isometric voluntary contractions. VL aponeurosis stiffness was calculated from ultrasonography data. Motor unit (MU) mean firing rate (MFR) and recruitment threshold were estimated using a validated electromyography decomposition algorithm during submaximal trapezoidal contractions (20, 30, 50, 70, 80% of MVC). The MFR vs. RT relationship was computed to characterize neural strategies.

Results: No significant difference between groups was found for VA at every contraction level. Boys displayed a lower VL aponeurosis stiffness than men (46.9 ± 14.8 and 65.4 ± 13.7 $N.mm^{-1}$; p0.01). In addition, no significant difference was found for the MFR vs. RT relationship parameters between groups.

Discussion and Conclusion: Interestingly, no difference between boys and men was found for VA or motor unit recruitment strategies, whatever the contraction level investigated. It is suggested that at the optimal muscle length,

the mechanical properties of the musculotendinous system do not affect the neural recruitment strategies, possibly because the mechanical state of the muscle is optimized. Additional investigations at non-optimal muscle lengths are required to test this assumption.

Performance Simulation Neurofeedback Training for Elite Athletes – A New Concept in Neurofeedback Training

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Background: Neurofeedback training is a well-known tool in sport psychology for improving skill acquisition and performance, but it has also been beset by conceptual and methodological problems. This work examined the use of a new form of electroencephalographic (EEG) based training, dubbed performance simulation neurofeedback training (PSNT), as a means to improve elite-level athletes' (archers) performance.

Methods: We adopted a mixed design with group (PSNT, active control) as a between-subject factor and phase of session (pre-, posttesting) as the within-subject factor. Unlike traditional neurofeedback training, PSNT measures EEG activity across multiple brainwaves and compares it to that of the previously identified desired brain activity in a dedicated performance simulation. A single channel EEG device, NeuroSky Mindwave mobile (San Jose, CA, USA), and the software Hit the Gold (Core Interface; Zagreb, Croatia) were used for this work. Eleven elite-level archers attended on average five sessions, in which a simulated PSNT or a video observation intervention was conducted between 36 pre- and 36 post-intervention measured arrows.

Results: Participants in the PSNT group increased their score from pre- to posttesting while participants' score in the video observation group deteriorated from pre- to posttesting (Two-Way Mixed ANOVA, $p = .046$).

Conclusion: Archers can improve their performance by using a PSNT platform. Further research using more accurate hardware is needed to explore PSNT's effectiveness over time and across other performance domains. Other athletic disciplines may benefit from this method as well.

Italian Serie A – Israeli Premier League Comparative Analysis

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Football leagues around the world differ in style of play and in the level of play. Given an ability to isolate the parameters in which these differences are reflected, doing so in relation to match outcome, professionals in lower-tier leagues can give greater importance to these parameters in their work in order to raise the level of play. In this study, a comparison between the Italian Serie A (top tier) and Israeli Premier League (low tier) was performed, seeking general differences and comparing match outcome driving parameters in both leagues. Finally, an attempt to build an 'On the Ball Metrics' based match outcome prediction model was performed using various machine learning techniques. The data used in order to perform the above mentioned analysis consisted of summarized team data from 760 Serie A matches and 480 Israeli Premier League (IPL) matches. The data was provided by Instat, Ltd. Data for a single match contained values from 455 different parameters. Our findings show significant differences were found in 54 out of 128 predictors, showing the vast differences in quality of performance between the leagues. Differences were detected in parameters related to quality of ball movement, attacking efficiency and action speed. When extracting match outcome driving parameters for each of the leagues, we found vast common ground between the two subsets, inferring that the difference between the two leagues originate first and foremost from the quality of performance and not from emphasizing different aspects of the game. The match outcome drivers found in our analysis can be referred to categories such as ball possession, key actions, quality of performance and ball retrieval.

The Relationships between Two Repeated Activity Tests and Aerobic Fitness of Volleyball Players

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Background: In order to examine the ability of athletes to perform intense intermittent activity, repeated activity tests have usually employed rhythmic exercise such as running or cycling. However, in sports such as volleyball, jumping serves as the leading type of action during the game (Bergeles et al., 2009). It was also suggested that a higher-level of aerobic fitness is required for improved performance during intense intermittent activity (Meckel et al., 2009). The aim of the present study, therefore, was to determine performance indices of the repeated sprint test (RST), and to examine their relationships with performance indices of the repeated jump test (RJT) and with aerobic fitness (VO_2 max) among trained volleyball players.

Methods: Sixteen male volleyball players performed RST (6 X 30m sprints), RJT (6 sets of 6 consecutive jumps), and an aerobic power test (20m Shuttle Run Test). Performance indices for the RST and the RJT were: a) ideal 30-m run time (IS), total run time (TS) of the 6 sprints, and performance decrement (PD) during the test; and b) ideal jump height (IJ), total jump height (TJ) of all the jumps, and performance decrement (PD) during the test, respectively.

Results: No significant correlations were found between performance indices of the RST and RJT. Significant correlations were found between PD, IS, and TS in the RST protocol and predicted VO_2 max (r= -0.60, -0.75, -0.77, respectively). No significant correlations were found between performance indices of the RJT (IJ, TJ and PD) and predicted VO_2 max.

Conclusions: The findings suggest that a selection of repeated activity test protocols should acknowledge the specific technique used in the sport, and that a distinct RJT, rather than the classic RST, is more appropriate for assessing the anaerobic capabilities of volleyball players. The findings also suggest that aerobic fitness plays only a minor role in performance maintenance throughout the characteristic repeated jumping activity of a volleyball game.

Time Wasting in English Premier League

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Fairness is a mainstay for our society to function properly. In this regard football is an important domain of human endeavor as a global multi-billion industry and as one the most watched and discussed activities. It has the potential to project behavior into other domains of life. Consequently, we decided to focus our attention on one particularly notorious behavior, namely, time wasting during critical stages of English Premier League football matches. Analysis of data from all the matches played during the 2014-15 season revealed that the leading team may be as much as twice slower in putting the ball back into play in order to maintain its favorable position until the end of the match. Conditions that facilitate such unethical behavior are discussed.Fresh Conceptualization of Team Flow

Fresh Conceptualization of Team Flow

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Attempts have been made to understand the complex dynamic relationships involved in team sports and explain the nature of successful performance. In sports, these components are particularly relevant because athletes often attribute peak performances and outcomes to psychological states such as team flow. We focused on exploring team flow state as an independent construct whose dimensions need to be identified by research. The purpose of this investigation was to conceptualize team flow state and develop an inventory to measure it.

We used a phenomenological qualitative research design to capture team flow state experiences of athletes, coaches, and sport psychologists. Thematic analysis of the data generated 14 team flow dimensions, seven similar to individual flow and seven new team flow dimensions. Then we developed the Team Flow State Inventory (56-item TFSI) based on the content of the team flow theoretical model. The analysis of the qualitative data for the dimensions generated 102 raw data statements which were divided between 32 first-order themes, creating a pool of items for the TFSI. Confirmation of the structure, content validity and comprehensibility of the 56-item TFSI was provided by five flow experts.

We performed CFA which determined the internal structure and psychometric characteristics, as well as the goodness of fit of the TFSI with the hypothesized theoretical model of team flow. A sample of 358 active athletes in various team sports was recruited to complete the 56-item TFSI. Because this version of the TFSI did not produce a satisfactory fit, item-deleted alphas and standardized residual covariance were used to improve the model fit by omitting one item from each dimension. Results showed all fit indices of the 42-item TFSI were at least acceptable $x2$/sd = 2.31, RMSE = 0.06, TLI = 0.90, and CFI = 0.92. Internal validity was also satisfactory with Cronbach alpha coefficients that ranged from α =.69 to α =.87. These results confirmed the acceptable construct validity of the TFSI. In the next step I examined and established significant discriminant validity between the TFSI and measures of individual flow (Flow State Scale-2; FSS-2), group cohesion (Group Environment Questionnaire; GEQ), and collective efficacy (Collective Efficacy Questionnaire for Sports; CEQS), indicating that team flow is a construct that is independent of individual flow and distinct from team cohesion and collective efficacy.

The contributions of this research lie in offering a new conceptualization of team flow as an independent concept, designing the 42-item TFSI, a valid and reliable inventory for measuring experiences of the team flow state, and suggesting future directions for research and practice for team flow.

The Chronology of Chaos: Organizational Complexity in the Hapoel Tel-Aviv Football Club

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Background: Complexity theory is an interdisciplinary theory that grew out of systems theory. It draws from research in the natural sciences that examines uncertainty and situations out of equilibrium (Cilliers, 2008). The emergence of things is in the focus of the research, while the system cannot be predicted by analyzing each of the components by itself (Goldstein, 2000). At the heart of the complex system simultaneously lie overlapping and conflicting descriptions (Stacey, 2003; Richardson, 2008).

Aim: The current case study examines aspects of organizational complexity in professional football by focusing on the Israeli club of Hapoel Tel Aviv.

Methods: The research is based on qualitative methods, including interpretive analyses of in-depth interviews with key actors in the field of professional football, observations conducted during matches, training sessions and special events as well as interpretive analysis of editorials and interviews published in the Israeli press. The research was conducted over a one and a half year period during which Amir Cabiri was the owner of the club (2015-2016).

Results: The findings reveal various aspects of organizational complexity in Hapoel Tel Aviv, including a multiplicity of conflictual stakeholders, ambiguity in the structure of ownership, managerial instability and existing paradoxes in the organizational culture of the club. Specifically, the study identifies three paradoxes that exemplify the core of organizational culture and complexity in the club: 1) the mixture of passionate emotions of love and hate; 2) the mixed mentality of a top club associated with inferiority; and 3) the stakeholders' decisive attitudes regarding the need for improvement, together with their inclination to preserve the status-quo in order to maintain power and personal influence.

Discussion and Conclusions: The current research adds an empiric layer to the narrow academic literature on organizational complexity theory in professional sports, in general, and in football, in particular. This case study suggests that sport organizations that function in a complex environment and consist of inherent components of disorder, need to create an internal order by acknowledging multicolored and organizational variance, fostering mutual tolerance and encouraging transparency in the organization. The case study of Hapoel Tel Aviv emphasizes the risks that arise when lacking these managerial patterns, as well as the need for a professional and experienced managerial team that might lead the club forward in times of crisis.

Improving Our Sport Psychology Research: What Can Be Done?

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Although criticism of the quality and methods of sport psychology research is not new, a flourishing academic debate has recently evolved regarding its quality. The purpose of this current presentation is to provide a brief and updated literature review of the contemporary debate about sport psychology research. Based on this brief review three possible ways to improve our sport psychology research among professional athletes are suggested. The first way is to move toward a higher differentiation of athletic populations. Despite the initial focus on high-level competitive athletes, many studies have been conducted with convenience samples of non-athletes/college students or with mixed populations of different competitive athletic levels. It is likely that exploring those populations separately will increase our research validity. A second method is to adopt a holistic perspective of athletes' functioning. Currently, the majority of studies among professional athletes are performance related. If we use a holistic perspective of the stress process and human functioning when exploring athletes' stressors in and outside of athletic life, it could enhance our understanding of athletic performance as well as psychological functioning and wellbeing. A third way is to explore intra-individual changes of professional athletes. Shifting the focus from differences between athletes, to differences within athletes offers the possibility to explore individuals in depth rather than superficially exploring large groups. This line of research will advance our understanding of what enables a particular athlete to thrive, in addition to why some athletes thrive more than others. The present review briefly follows the debate about sport psychology research designs and suggests what can be done to improve our research practice.

Stress and Wellbeing among Israeli Female Basketball Premier League Players: Exploring Weekly Fluctuations

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Background: Professional athletes are required to function in a competitive and demanding, and thus often stressful, environment. The harmful effects of stress on athletes' wellbeing has recently become a hot topic in the sport world, with basketball players coming forward and bravely sharing their battles with stress, anxiety and depression. Such stories have placed the exploration of the life stress and general wellbeing of athletes on the front stage of contemporary sport psychology research.

Aim: To investigate wellbeing and stress in the Israeli Female Basketball Premier League.

Methods: Professional basketball players from the Israeli Female Basketball Premier League (N=87), which represents 90% of the league's players, filled out a questionnaire package across three occasions over three consecutive weeks (T1, T2, T3) during the 2017-2018 season. Questionnaires included both general life variables (stress and subjective wellbeing) and sport-specific variables (engagement and performance).

Results: First, in order to estimate the within-person variability across the three time points, an Intra-Class Correlation (ICC) approach was used. Results indicated that the within-person variance ranged between 16% and 62%, indicating that the variables of interest do change across time. Second, to test the research hypotheses, a cross-lagged path model was run, in which each of the four research variables predicted the other three variables in the following week. The cross-lagged paths were tested while controlling for the outcomes from the previous time point, thus strengthening causality. As expected, cross-lagged paths were found between stress and performance such that stress in T1 and T2 negatively predicted performance in T2 and T3, respectively; however, the reverse paths were not significant.

Discussion: The fluctuation of the life stress level between weeks indicates the dynamic and demanding nature of the competitive sport environment in which female basketball players are required to perform. The negative cross-lagged effects found between life stress and athletic performance emphasize the continuous negative impact of life stress from one week to another, as well as the interchange between athletes' mental status and their performance.

Exercise and Childhood Obesity – 15 Years of Clinical Experience

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Israel, as many other countries throughout the world, faces an alarming increase in the number of obese children and adolescents. Long-term follow-up indicates that obese children and adolescents tend to become

obese adults. Moreover, obesity is associated with increased risk of insulin resistance and non-insulin dependent diabetes, hypertension, hyperlipidemia and atherosclerosis, as well as gastrointestinal, endocrine, orthopedic and respiratory morbidity and mortality. In addition, adults who were obese children have increased morbidity and mortality independent of their adult weight. Thus, effective prevention and treatment of obesity must start during childhood.

The Child Health and Sports Center was established at the Meir Medical Center in Kfar-Saba, Israel in 1999, as a clinical and research center that uses exercise for the treatment of pediatric diseases. Clearly, treating childhood obesity was one of the center's initial missions. The center developed and implemented successful childhood obesity prevention and treatment programs. In this presentation, we will share insights from our in-hospital multi-disciplinary intervention (dietary, behavioral and exercise) as well as our community based intervention to prevent and treat childhood obesity.

WHOLE – Wellbeing and Healthy Choices for Older Adults and Their Caregivers – A Presentation of a Project Funded by the European Commission 2015-1-DE02-KA204-002418 Erasmus+

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Active ageing is one of the biggest social challenges of the 21st century for European societies. One of its main objectives is to manage functional decline and frailty through a targeted intervention in physical fitness.

WHOLE's main objective was to promote active and healthy ageing through physical activity and healthy nutrition for frail seniors and older people at home using the personalized home care services provided to them by formal and informal caregivers. At the same time, WHOLE equally emphasized the effects of physical activity and healthy nutrition on the wellbeing and relief of formal, and especially informal, caregivers. WHOLE's specific objective was to develop a basic e-learning platform where interested caregivers, social organizations and social care professionals will have the opportunity to network and be trained on-line. They are trained to implement physical activity as an integral part of the home care services they provide. Additionally, WHOLE aims to aid in the overall prevention of functional decline and frailty among older people.

The project consortium consists of representatives from agencies and universities from Germany, Austria, Greece, Bulgaria, Ireland and Israel, and all materials in the platform are available in the following languages: English, German, Hebrew, Bulgarian and Greek (www.project-whole.com).

The exercise program includes six main modules: Warming-up the Joints, Aerobic Exercises (enhancing the cardiorespiratory system), Upper Body Exercises (enhancing strength and flexibility in the upper body), Lower Body Exercises (enhancing strength and flexibility in the lower body), Balance & Coordination (enhancing static and dynamic postural stability and preventing falls), and Exercising Together (enhancing strength and flexibility while working together). Users are guided to tailor their training classes combining exercises from each of the six modules in each class. Safety guidelines and detailed explanations are also provided.

The exercise program is presented in the e-learning platform in a friendly manner including pictures and videos of the exercises. The platform will be demonstrated and practiced during the lecture, in addition to some scientific background.

Tibial Impact Accelerations in Gait of Primary School Overweight and Obese Children and Normal-Weight Children: The Effect of Speed and Visual Biofeedback

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Tibial stress fractures are associated with increased lower extremity loading at initial foot-ground contact, reflected in high peak positive acceleration (8 g) of the tibia in adults. The use of visual biofeedback has been suggested to reduce mean peak positive acceleration of the tibia. There are no reported data on peak positive acceleration of the tibia in children and obese children during walking and running. The aims of this study were 1) To compare overweight and obese children's mean peak positive acceleration to normal weight children; 2) To determine if the real-time visual feedback effects can reduce mean peak positive acceleration responses in obese children across a range of gait speeds.

A Modified Wingate Anaerobic Test May Be Used for the Evaluation of Growth Hormone Secretion in Children with Short Stature

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Background: The diagnosis of growth hormone (GH) deficiency in children with short stature is complex and commonly done by pharmacologic provocation tests. There is a need for a physiological stimulation test such as exercise. We previously demonstrated that the traditional Wingate anaerobic test (WAnT) cannot be used as a GH provocation test. Therefore, we transformed the WAnT test to include shorter repetitions with recovery periods between them to mimic the usual physical activity performed by children. We hypothesized that the GH response to anaerobic test would be similar to the GH response to the commonly used pharmacologic provocation test.

Methods: Thirteen children (11 males and 2 females, age range 5.0–16.2 years) participated in the study. Each participant performed a modified WAnT including 10 cycles of all-out cycling for 15 seconds against constant resistance followed by 60 seconds of cycling without resistance. Blood samples for GH were collected before and 15, 30, 45, and 60 minutes after the beginning of exercise. In addition, we collected pre- and post-exercise blood lactate and cortisol levels. Children with abnormal GH secretion also performed the standardized pharmacologic test (clonidine or glucagon).

Results: There was normal GH secretion in four out of the 13 children and nine had subnormal GH secretion in the anaerobic test. Seven out of the nine (77.8%) children with subnormal GH secretion also had a low GH secretion in the pharmacological test.

Discussion: The modified WAnT has a good correlation with the standard pharmacological GH provocation test and can be used as physiological test for GH secretion. Performing an exercise test to evaluate GH secretion may prevent the need to perform the commonly unpleasant provocation GH secretion tests in children.

Going Back to Power Lifting: A Case Study of a 30-Year-Old Man after a Myocardial Infarction

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Shiraz, a 30-year old male, started a cardiac rehabilitation program following an inferior myocardial infarction (MI). Before his cardiac event, Shiraz was training for his first power lifting competition. Today, eight months following his MI, Shiraz aspires to go back to being a powerlifter.

In this presentation we will review Shiraz's medical background, the exercise physiology of power lifting, and the existing or non-existing guidelines for professional power lifters. Also, we will review his training program in the cardiac rehabilitation center, and try to answer the crucial question: Will Shiraz be able to go back to professional power lifting? Following this presentation, Shiraz will tell his story from the point of view of a patient, who had to face a new reality at a very young age.

The Effectiveness of Pre-Performance Routines on Elite Swimmers' Performance, Self-Efficacy, Anxiety and Emotions

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Background: A Pre-Performance Routine (PPR) is a repeatable series of motor and mental activities performed prior to undertaking a task (Lidor & Singer, 2003). Considering the structure of a swimming competition, integrating a PPR in the minutes preceding the event could be a relevant procedure for swimmers to enhance their performance.

Aim: The aim of the present study was to test the effectiveness of performing a PPR immediately before swimming a 100-meter simulation race on elite swimmers' speed, motor efficiency, self-efficacy, state anxiety, and emotions.

Method: Forty-six NCAA Division I swimmers (27 males, 19 females) were stratified to either the experimental or control conditions based on their previous use of a PPR. The intervention included four instructional sessions aimed to establish individual motor and mental pre-performance routines.

Results: A mixed RM-ANOVA was performed to test for differences between the baseline and final simulation in speed, biomechanical performance indicators, self-efficacy, and emotions for the two conditions. Following the first competitive simulation, self-efficacy scores for the PPR condition were lower than the control condition, whereas the opposite was revealed after the intervention and the second race simulation. Additionally, state anxiety decreased from the first to second simulated competition in swimmers in both conditions. Swimmers exposed to the PPR intervention reported an increase in positive emotions and a decrease in negative emotions, however most of the findings were non-significant and similarly, no changes in biomechanical indices were noted.

Discussion and Conclusions: A PPR may promote the athlete's swimming self-efficacy and positive emotion, but longer exposure to it may result in performance enhancement.

Sochi 2014 Olympic Legacy: Social and Economic Environment

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The report presents the findings of a study of economic, social and humanitarian aspects of the Sochi 2014 Games' legacy conducted by a joint working group comprising representatives of the RIOU and the Sochi city administration. It looks at the international dimension of the Olympic legacy, measured indicators, changes in the host city's educational landscape resulting from the Games, grassroots sport development, creation of the post-Games social infrastructure, improvements in public health and social policy, expanded communications system, awareness-raising programs, and volunteering. Special attention is given to such economic aspects as raising the host city's investment attractiveness and – trends in basic economic indicators, including the Games effect, budgetary impact and creation of new financial tools. The full text of the study is published in Russia in the form of a monograph.

Comprehensive legacy monitoring, permanently performed by the RIOU includes:

- Environmental indicators (public water supply, quality of water and air, transport networks, traffic congestion, the greenhouse effect, outdoor public recreation areas, operation of Olympic and Paralympic venues);
- Social and cultural indicators (physical activity and sport at schools, regulatory work, sports media, elite athletes, sports facilities, inequality, discrimination, racism, violence in sport, political involvement in the Games' organization, spectators, volunteers, host city's media image, accessibility of venues and community services);
- Economic indicators (employment by type of economic activity, company size, public transport, wages, organization of international events, consumer price index, hotel price index, real estate market, direct foreign investment, employment opportunities for people with disabilities, entertainment industry).
- The socio-economic study conducted by RIOU led to the following conclusions:
- Sochi ensured Russia's integration into the international sports movement (Sochi 2014 Games, Formula 1 Russian Grand Prix,

Confederations Cup, FIFA 2018 World Cup);

- Sochi has been transformed from a regional summer resort into a multi-purpose all-season world-class center for sport, business, culture and tourism;
- Sochi benefits the updated infrastructure: not only the Olympic sports venues but also rail and road networks, an international airport, modernized engineering infrastructure, gas pipelines, sewage treatment facilities, state-of-the-art hotels, improved coastline;
- Sochi community network was modernized in terms of the humanitarian aspects – educational, cultural and sporting facilities;
- Sochi shows the best practice in changing attitudes towards people with disabilities;
- Sochi is a key driver of the volunteer movement in Russia;
- Both Sochi and the Krasnodar Region increased investment attractiveness (2017 investment forum – 7.6 billion roubles – total sum of signed contracts);
- Sochi shows an increase of 2.4 times new jobs for the period of 2007-2017.

There is no doubt that these areas of the 2014 Games legacy require further fundamental and applied research, which means there is an acute need for highly-qualified specialists and research centers, such as RIOU, to implement these studies.

The Optimal Kinematic Modeling of the Stalder Backward to Handstand on the Uneven Bars Technique – A Case Study

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Background: A successful routine for competitors in artistic gymnastics consists of the most complex coordination elements and their successful execution. Biomechanical analysis of the movement is well suited to describe, develop and improve technique. Although many variables influence success, biomechanical considerations as reflected in correct or incorrect technique are crucial. The kinematic analysis of a certain kind of movement in artistic gymnastics is necessary for the rational and economical process of analyzed movement.

Aims: To define the optimal kinematic parameters of the selected exercise Stalder backward to handstand on the uneven bars, which was performed at the 39th World Cup in Artistic Gymnastics in Maribor (SLO). The kinematic model of the performance of the Stalder backward exercise is a case study with an optimal definition of kinematic parameters.

Methods: Kinematic parameters were determined by the APAS 3-D video system, using 16 anthropometric reference points and four body segments. The research sample consisted of eight female gymnasts who participated in the Finals and performed 10 Stalder backward exercises. The sample of measuring instruments that we used consisted of a set of kinematic parameters which were calculated on the basis of the anthropometric model (foot, center of gravity, shoulder joint and head). The center of gravity of the body was calculated based on the model presented by Winer.

Results: The results of the research defined the kinematic exercise model, which requires four phases: 1) Upswing from a handstand position to balance the resistance front; 2) Downswing to upswing with clear support; 3) Lower vertical passing; 4) Swing to a handstand position.

Discussion: Phase I begins from a handstand position and ends at the moment in the upfront position, in the 8th position when shoulder deviation reaches the maximum forward position. Most competitors end this phase in the 4th to 8th position. Phase II starts with the movement of the shoulder point from the reverse to the back, and lasts until the lower vertical line passes. Competitors at this phase end between the 36th and 47th positions. Phase III begins when the shoulder points pass through the lower vertical, and lasts until the moment

of the start of the flow. This phase ends between the 52nd and 60th position. The IV phase begins with the overleap of the bar and continues with the further extension of the arm, the shoulder joint and the adduction in the wrist to reach the handstand position.

Conclusion: Optimizing the technique of successful performance is important for detecting different technique styles that used by female gymnasts. Results of this case study could optimize the performance of other young gymnasts at all levels of performance.

The IOC Olympic Studies Centre and the Academic Community of Olympic Studies

Nuria Puig

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The IOC Olympic Studies Centre (OSC) is the world source of reference for Olympic knowledge. Our mission is to share this knowledge with professionals and researchers by providing information, giving access to our unique collections, enabling research and stimulating intellectual exchange.

As part of the IOC, we are uniquely placed to collect and share the most up-to-date and accurate information on Olympism. Our collections include the IOC's historical archives; the official publications of the IOC, the Organizing Committees for the Olympic Games, the candidate cities and other Olympic Movement stakeholders; as well as books, articles and journals. Our resources cover all the key themes related to the Olympic Games and the Olympic Movement, and their place within society. To give easy access to our unique resources, we have created the Olympic World Library, which is simultaneously a library catalogue, an information portal and a search engine wholly dedicated to Olympic knowledge. This platform offers access to our entire digital and printed collections, and connects you directly to other important publication platforms which publish Olympic content.

One of our key roles is to facilitate communication and cooperation between the IOC and the international academic community. This worldwide community consists mainly of over 40 Olympic Studies Centers and hundreds of individual scholars and university students with different academic and cultural backgrounds working on academic projects related to Olympism.

Thanks to this regular exchange and the work conducted by the academics, we enrich the world's Olympic knowledge; share new analyses on key topics related to the Olympic Movement; and provide guidance to universities wishing to launch Olympic studies initiatives.

With our two research grant programs, we strengthen the exchanges between the academic community and the IOC. Through the PhD Students and Early Career Academics Research Grant Program, we support young researchers engaged in scholarly Olympic-related research, and foster the development of future professors in the various fields of Olympic studies. Thanks to the Advanced Olympic Research Grant Program, we encourage established researchers to conduct projects in IOC priority fields of research and facilitate collaboration between them and the IOC.

Whether we are sharing our resources, awarding a research grant or collaborating with academics on a project, we are creating bridges between the academic community and the Olympic Movement. We firmly believe that this collaboration can contribute to the goal of Olympism, which is to place sport at the service of the harmonious development of humankind.

To learn more about the Olympic Studies Centre, visit olympic.org/studies or contact us at studies.centre@olympic.org.

Welcoming Girls in Physical Education, as Long as Their Bodies Are Fit

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Background: Physical Education (PE) in Israel, as in many countries, is formally associated with health promotion and cultivation of self-esteem and wellbeing (Azzarito & Solomon, 2005; Galily, Lidor, & Ben-Porat, 2009; Penney & Evans, 2002). It is a formal pedagogy that claims to be a space of equality, i.e. an inclusive space for all sexes, races, socio-economic statuses and body shapes. However, research shows that while PE classes significantly contribute to the self-esteem and wellbeing of some girls, for many others they are a source of exclusion and distress (Adams & Bettis, 2003; Clark, 2012; Robyne, 2010).

Aim: This study is the first to address PE in Israel from a feminist perspective. It asks the following questions: How does PE in Israel allow a variety of girls to enjoy the positive values associated with the field? And when does it fail to do so?

Method: This study employed a qualitative research design in two public junior high schools in Israel. It included 12 observations in PE classes, 15 focus groups with 60 female students, interviews with 26 physical educators and a critical review of the PE curriculum.

Results: The study shows that girls who are characterized as thin and fit are more likely to benefit from PE's positive values, feel included and experience themselves as 'good in PE', while others – overweight girls or those who subjectively experience themselves as unfit, are more likely to face shame and embarrassment, and in some cases to be excluded. The study shows that the PE's focus on physical aspects of education – mainly fitness and weight – diminishes its potential to contribute to students' emotional health and wellbeing. Thus, the study exposes PE as a space that poses barriers and may become offensive for certain girls because of their body shape and level of fitness. In addition, this study shows that while most physical educators are aware of body shape diversity and the educational value of inclusion, many nonetheless continue to play a role in reproducing barriers and maintaining exclusionary practices. Thus, they undermine the emotional health and wellbeing of some of their female students.

Conclusion: The presentation suggests that physical educators' training programs should be revised in order to include knowledge related to girls and their bodies as well as practices of inclusion. It also suggests that the discussion about PE's objective to promote health needs to expand at the institutional and pedagogical levels. Specifically, the commitment of PE to students' emotional health and wellbeing should be elaborated and clarified.

Anatomy of the Abdominal Wall

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The abdominal wall encompasses the trunk, encircled superiorly by the thoracic cage and inferiorly by the pelvic girdle, and although continuous, it is subdivided into the anterior, posterior and lateral walls. Kinematic and kinetic understanding of the trunk as to the spine, abdominal and back muscles, diaphragm and pelvic floor complex is imperative for an adequate application of core conditioning and trunk stabilization training. This presentation will review the anatomy of the abdominal wall, back muscles and the pelvic floor complex, and will elaborate further on the relationship between the intrinsic and global muscle systems contributing to the stabilization of the trunk.

Turn 'Couch Potato' Into Roadrunner: Using Web4gym Screens to Combat Screen-Time

Ilana Reches

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Background: Health experts have declared digital addiction as the next big health problem. Research has shown the relationship between screen addiction and sedentary behavior, rising obesity and attention problems (Beurkens, 2017). Psychologists warn of an increase in family communication problems and domestic abuse behaviors. Educators have trouble with smart-phones in class.

Harris, (2018) in his report and Alter (2017) in his book, Irresistible: The rise of addictive technology and the business of keeping us hooked, reveal deliberate decisions by the most powerful technology companies to increase addictive technologies with their negative effects. However, a UNICEF report (Dec. 2017) found the impact of screens to be inconclusive.

A survey of the web4gym program showed that 78.6% of the parents (N=300) discouraged their children from using screens because the 'Screens create Zombies, prevent physical activity and do not contribute to creative thinking'.

Aim: Use screens to combat screen-time, incorporating digital activity as a part of a healthy daily routine, balancing solitary play with an addition of motor-social, joyful, creative interaction aimed to enhance self-confidence and leadership skills, while omitting low-rate imitations and/or competitions against screen robot Gym apps.

Method: web4gym uses screens to combat screen-time.

- The web4gym screen's design creates an intrinsic active movement-based environment for kids to achieve wholesome development and creative expression on real live apparatus, external to the screen.
- Implement the National Association for Sports and Physical Education resolution: Health-enhancing body activities and Movement Education concepts. Web4gym activity is set-up for small groups (2-5 kids): A screen-inspiration turns into real-live activity, in a formal educational setting, or within the private setting. In the formal educational setting the whole class goes through one jolly round of the main elements which are represented on the screen (shoot real balls in the basketball hoop; paddle wheels; crawl under a bench, etc.). Then, a small group plays, independently, at the designated screen-and-apparatus area.

Each member gets a turn as a Group Leader. The Group Leader chooses the apparatus from the screen sand box, and decides which apparatus each member goes to. However, each member creates his/her own idea at the apparatus.

- Provide scholarly high order thinking processes, (Bloom's taxonomy) from 'information' to 'problem solving'. Film the kids to assess themselves: verbally, creatively, using free expression.

Results and Conclusions: The **web4gym** program (Reches & Rutin, 2001; 2014) is an innovation for a balanced screen-time daily routine. It is applied in 20 kindergartens. Seven hundred kindergarten children and their involved parents are enjoying playful activity on a real-live apparatus. Physical participation and social cooperation are close to 100%. All children use High Order language as they instruct each other by the end of the activity.

The Effect of a Single Bout of Aerobic Training at Different Intensities on Learning and Long-Term Memory Processes in Young Adults with ADHD

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Background: Several researchers have examined the effect of physical activity (PA) on cognitive functions among participants with attention deficit hyperactivity disorder (ADHD), with only a few directly assessing its effects on learning or on long-term memory. The intensity of PA as a factor in changing cognitive function was recently addressed by participants without ADHD.

Aim: To examine the effects of a single bout of low intensity vs. medium-high intensity aerobic exercise on the learning process of declarative memory for facts in young adults with ADHD.

Methods: Twenty-eight physically active young adults with ADHD (age = 25±2.3 yr) performed nine appointments in three conditions: a single bout of low-intensity aerobic exercise, a single bout of medium-high intensity aerobic exercise, or a control condition (watching a silent film) for 25 min, which was followed by an exam about one of three subjects: dolphins, the Chinese zodiac, or chocolate. Then they were presented with an informative video about the subject, and were examined on it. Twenty-four hours and two weeks later, they performed two more exams about the subject. In the second and third phases they were presented and examined about the second and third informative videos in the second and third conditions. The assignment of the order of conditions and the video for learning in each of the phases was random.

Results: In general, in all three conditions, there was a significant decrease in the total score between the test performed immediately following the exposure to the video and the tests that took place 24 hours and two weeks later ($F_{2,54}=47.36$, p.01). However, participants had a significantly higher score 24 hours following exposure to the video in both the low intensity and the medium-high intensity condition phases in comparison to their performance 24 hours following exposure to the informative video in the control condition phase ($F_{2,54}=6.14$, p.01). In addition, two weeks following exposure to the video, participants had a significantly higher score in the medium-high intensity condition phase in comparison to the control condition phase ($F_{2,54}=3.1$, p.05).

Discussion: The results of the study show that a single bout of PA comprising 25 minutes of low or medium–high aerobic exercises had a clear advantage in the ability of participants with ADHD to retain information from an instructional video presented after the PA intervention. Importantly, the most robust effect of the PA was on performance at 24 hours and at two weeks post-training.

Conclusion: The present findings point to a positive effect of low to high aerobic exercises on retaining declarative long-term memory for young adults with ADHD. Based upon this, these findings could be used to encourage young adults with ADHD to perform aerobic exercises prior to learning new declarative information.

Exercise Ventilatory Limitation in Cystic Fibrosis Patients with Normal Breathing Reserve

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Aim: Exercise ventilatory limitation (EVL) is conventionally defined by a reduced breathing reserve (BR). We hypothesized that EVL may be present despite a normal BR in cystic fibrosis (CF).

Methods: Fifteen adults (f=8, age 34y, 18-43y) CF patients with a wide range of pulmonary obstruction performed a symptom-limited exercise test on a cycle ergometer. We measured exercise inspiratory capacity (IC) and analyzed exercise flow-volume loops.

Results: BR was reduced in the six patients with FEV_1 50%pred. The remaining nine patients had mild to moderate obstructive defects on spirometry (median FEV_1 61% predicted, range 50-86%), and a normal BR (21 L/min, 12-44 L/min). In spite of a normal BR, the patients had clear evidence of a ventilatory limitation during exercise. In this subgroup, dynamic hyperinflation was seen (IC decreased during exercise by 250 ml (100-860 ml); and an expiratory flow limitation was present over 78% (41-90%) of expiratory volume.

Conclusions: EVL was present in all CF patients studied. In six of 14 with FEV150%pred., BR was reduced.

"When the Wearable Says 'Time to Move' I Move…" – A Basic View of the Self-Tracking Phenomenon

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Background: Self-tracking with wearables (heart rate monitors, fitness apps etc.) has becomes more important in sports but also everyday life (Gugutzer, 2016). Research so far has addressed this especially from a physiological or psychological perspective. However, little is known about the phenomenon in general. Thus, the present study approaches self-tracking from a socio-scientific view and with a very open, explorative research question. The aim is to generate a more general description which can form a basis for further research. It is asked: How can the self-tracking phenomenon be described?

Method: Along with the open research question the study uses Grounded Theory for data analysis and theory generation (Strauss, 1994). Thus, the research process alternated between four phases of data collection (including N=12 narrative interviews: 7 women, 4 men; aged 20 to 62 years) and four open coding phases. Within the coding phases the data were investigated for core categories/subcategories and memos were produced and refined. The memos served to identify substantive codes and organize them within a theoretical framework. This led to a theoretical description of the self-tracking phenomenon.

Results: Four core categories were derived. First, various motives for using trackers were found, e. g. 'weight loss', 'training guidance', 'self-awareness' or 'objectify feelings'. Second, it can be seen that users are very differently informed about the wearables (function, data security and further use, aim setting, etc.). Third, using self-trackers seems to have very different effects, e.g., a more conscious moving behavior or improved motivation. This is connected to the fourth category: it seems that fitness trackers have the potential to literally determine the behavior of some people while others just acknowledge the tracking data or reinterpret them.

Discussion and Conclusion: The results allow a basic description of the fitness-tracking phenomenon even though probably not all aspects were identified. Some of the results already seem very familiar. Especially motives like "weight loss" or "training guidance" are relatively well researched and the questions of data security and further use is reflected in many public discussions. However, the study also included some aspects that were

neglected so far. The interviews give an idea that an initially voluntarily chosen instrument for self-optimization can become a dominant tool that affects behavior (not necessarily always in a good way). Not all users seemed to still act completely self-determined. The results also question if users of self-trackers are always well informed (e.g. about the meaning of the tracking data). For instance, people relied on the suggestions of the self-trackers to walk 10,000 steps a day even though they were not able to actually judge this. Thus, while positive effects can be found it is suggested that further studies also include a more skeptical view of self-tracking.

Emotion-Based Professional Development Training and First Year Teachers' Attitudes to Students

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Background: Teachers' practice involves facing challenges with personal emotions – excitement, anxiety, love, anger, disappointment, etc., in addition to cognitive coping and dealing with pedagogical content (Hoekstra & Korthagen2011; Oplatka ,2017). More and more researchers from the field of education and psychology call for bringing back the component of emotion such as caring and empathy to teaching in the classroom. Their main assumption is that it is not possible to separate cognition from emotion. Therefore, in recent years more attention has been addressed to research on emotions in teacher education (Rosenblum, 2015; Zach, 2010).

Aim: The aim of the current research is to study the contribution of an emotion based professional program 'Lovecircles' for first year teachers.

Methods: The emotion based program is a three-staged program: from the personal to group dimension including experiential, verbal and arts activities, as well as role-playing and simulations which were photographed and recorded. These experimental activities enable participants to attend to their personal emotion and develop attention to others. The activities enabled participants to face issues from personal narratives (such as the impact of inspirational people, memories of diverse experiences and their meanings) and from a professional narrative (documentation of challenging events through an integration of elements such as metaphors and emotions, and styles of communication, such as opening or inhibiting). Photographs and video were analyzed by two researchers in order to identify the impact of the course on the development of the perceived emotion-based teaching approach.

Results: Results indicate that participants developed awareness, perception and appreciation of the role of emotions on their practice and acquired abilities to regulate emotions and act upon them. Participants perceived a new developmental approach to teaching based on attention, dialogue, empathy and regulation of emotion. These results highlight the impact of 'Lovecircles', the emotion-based professional development program, on physical and sport educators' interactions and performance, due to their participation in the program. Consequently, the contribution of this study might be significant in the integration of emotional aspects of physical education teachers'

personal dimension during their professional development process. Decision-makers will then be able to deliberate the integration of emotions in personal development within the sport education professional development program.

Assessment of Functional Fitness and Physical Activity Levels of Older Adults

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Background: Although fitness is perceived as something related to young people, it is vital for the elderly for social, psychological and physiological health. Functional fitness performance provides the physiological capacity to perform normal everyday activities safely and independently without undue fatigue (Rikli & Jones, 1999a). As people get older, their physical ability level is restricted due to medical, social and economic changes.

Aim: The objectives of this study were, first, to identify the relationship between functional fitness levels and physical activity levels of older adults and secondly, to evaluate the effects of social-economic and health statutes on functional fitness**.**

Methods: One hundred and one elderly participants (62 females and 38 males, age between 60-85 years, body mass: 68,49±12,22; height: 161,78±7,94) took part in this study. Participants were asked to answer the functional fitness test (FFT) and a short form of the International Physical Activity Questionnaire (IPAQ). respectively. The FFT provides a simple, easy-to-use battery of test items assessing the functional fitness of older adults. The FFT comprises six tests that measure the basic activities of daily living. These are: 1) Chair Stand; 2) Arm Curl; 3) Two-Minute Step Test or Six-Minute Walk; 4) Chair Sit and Reach; 5) Up and Go; and 6) Back Scratch Test.

Result: The main finding of the study was that there is no relation between physical activity level (PAL) and FFT score. There was also no statistically significant difference between the FFT score and PAL according to gender. In addition, there was no significant difference between the PAL and FFT score according to smoking and alcohol use variables. However, it was found that participants with cardiac disease or diabetes mellitus had a lower physical activity level and FFT score.

Discussion: The literature shows that as the elderly become more dependent at home, their physical activity decreases, and environmental factors, like alcohol, don't have a positive or negative effect on this condition. Yet, the literature shows that previous health problems have a negative effect on physical activity.

Conclusion: It is believed that regardless of smoking and alcohol use, heart disease and diabetes mellitus are related to low levels of physical activity and FFT score. As a result, improving the level of physical activity may help prevent heart disease and diabetes mellitus.

The Effect of Exercise (Stability and Coordination) Training Programs on Risk of Falls in Older Adults with Cardiovascular Disease

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Background: Cardiovascular diseases (CVD) are considered to be a main reason for mortality, commonly because of cardiovascular complications and secondary morbidity. Falls are one of the possible causes for additional ailment alongside cardiovascular complications, as older adults with CVD are at higher risk of fall in comparison to age-matched healthy populations.

Aim: To investigate the effect of stability and coordination exercise within a cardiac rehabilitation program on measures of fall risk in elderly people with CVD enrolled in cardiac rehabilitation.

Methods: Twenty-eight patients with CVD participated in the study and were randomly assigned to an experiment or control group. The intervention continued 12 weeks, twice a week, within 75 minutes of the cardiac rehabilitation program. The experiment group received 20 minutes of stability and coordination exercise within the 75 minutes, while the control group performed the routine cardiac rehabilitation program (mainly based on aerobic and resistance exercises). Clinical balance measures included the Time Up and Go Test (TUG), the Functional Reach Test (FR) and Balance Error Scale System (BESS). The Five Time Sit to Stand Test (FTSST) was used as a measure for lower extremity muscle strength. The Fall Risk Assessment Tool (FRAT) was used to measure fall risk.

Results: The experiment group showed significant improvement post-intervention in the following parameters TUG (p0.01), BESS (p0.02) and FTSST (p0.01). In addition, a significant group X time interaction was found for the TUG and the BESS ($F_{2,48}$=13.5, p.01; $F_{2,48}$=4.29, p.05, respectively) implying a significant advantage for the experiment group post-intervention. No significant group X time interaction were found on the FR (p=0.2) and FTSST (p=0.12).

Discussion: The results of the current study confirm that stability and coordination training alongside cardiac rehabilitation improve static and dynamic balance, and muscle strength parameters that are considered major components in postural control. Improved postural control may reduce the risk of falls among people with CVD who are subject to higher risk of fall.

Conclusion: Trainers who work in cardiac rehabilitation centers should consider including stability and coordination training alongside the routine cardiac rehabilitation program.

Nothing but an Illusion? The Perception of Extreme Facial Expressions

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Background: The distinction between positive and negative facial expressions is assumed to be clear and robust. Nevertheless, recent research with intense real-life faces of winners and losers has shown that viewers are often unable to reliably differentiate the positivity or negativity (valence) of such expressions without the body context.

Aim: What do viewers believe they rely on while rating the valence of intense ambiguous expressions? Is it the face or the body? Does the allocation of our attentional resources reflect this belief?

Method: We designed an experiment in which after rating the valence (how positive or negative the emotional reaction is) of an intense image (non-diagnostic winning faces presented with the bodies), participants ranked their reliance on different facial and body features. Half of the participants completed the ratings from their memory, while the other half were presented again with the image.

In a consequent study, we analyzed the attentional eye scanning patterns during valence ratings of contextualized intense winning and losing facial expressions.

Results: Participants reported relying more on facial than on body cues, even though the facial expression was objectively non-diagnostic (as determined by independent rating studies). We refer to this phenomenon as Illusory Facial Affect: the perceptual attribution of clear positive or negative affect to an inherently ambiguous face while disregarding the objective diagnostic source of the affect in the body. Importantly, this illusion was not merely an artifact of memory, as the effect still held with images which were ranked while still presented on the screen.

Using eye tracking, we further showed that viewers allocated their attentional resources according to this belief, they fixated more on the face than on the body, while rating the valence of the image. Interestingly, when the face was diagnostic (loser), it received fewer fixations than when it was not diagnostic (winner).

Discussion and Conclusion: Viewers tend to overestimate the importance of facial expressions in emotion perception, while underestimating the importance of the body context. They also allocate more attentional resources to the non-diagnostic face than the body, even though they extract information from the body.

The Effectiveness of Legal Requirements in the Organization of Sports Events: The Case of Outdoor Sports

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From local sports events to international competitions held under the aegis of various types of organizations, millions of events take place throughout the world each year. But the setting-up of an outdoor sport event presents a whole host of legal challenges. Organizers are faced with many obligations they must fulfil. The difficulty lies in the multiplicity of their sources, and non-compliance may result in liability. Since the socio-economic issues associated with these events conditions the good health of a region, it's reasonable to question the effectiveness of organizer requirements in terms of risk management.

The subject has been only lightly touched upon in the literature. The aim here is to go beyond the enumeration of legal requirements through an applied perspective. While sports events hold great touristic appeal, organizing them proves complex in view of the related rules, to such a point that some on-the-spot rule adaptation may occur and compromise the imposed safety objectives. Do gaps therefore exist in the regulations or do they have perverse effects? Are they faced with resistance?

A dual methodology has been used consisting of an analysis of the legislative and regulatory texts in force, of several files filed with related case law, and sociological analysis of interviews conducted with the various parties involved, as well as reported and unreported participant observations at national and international events.

Organizers mainly comply with their obligations before filing their file, which conditions the organization of their event. If it lacks precision, a spirit of conciliation predominates and they are requested to enhance their security and/or safety measures. Accidents do occur, however, even when organizers have gone above and beyond the prescriptions of legal and regulatory requirements. Deviations from the rule are observed, as a result of management decisions, organizational dynamics and the representations collaborators may have of their tasks. Legal and regulatory requirements are hampered by practices on the ground (Gasparini, 2003; Carbonnier, 2004).

Several factors may place organizers in a difficult situation while they are hosting their event. With the logic of a preventive approach, prior identification

of any potential stumbling blocks linked to the organization of such events is important so as to avoid any accidents occurring, as well as any subsequent seeking of liability. It's also necessary to go further by taking account the relationship between the types of sporting events and volunteering.

Postural Stability and Academic Achievements among 5th Graders: An Experimental Field Study

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Background: Postural stability has been previously associated with academic achievements among kindergarten and primary school children (Planinsec, 2002; Rizzuto & Knight, 1993; Frick & Möhring, 2015). However, only little is known on how cognitive-motor processes underlie academic achievements.

Aims: The purpose of this research was twofold. First, it was aimed at investigating children's postural stability using continuous, rather than temporal or qualitative, assessment. Second, it was aimed at investigating cognitive-motor performance (e.g., single vs. dual task gait) and its correlates with achievements in math and language arts.

Method: Eighty-six 5th graders performed several dynamic and static balance tasks (e.g., walking on a beam, standing blindfolded on one foot), while their mediolateral trunk sway was assessed using a Kinect 3D sensor. Achievements in math and language arts were assessed using standardized tests.

Results: Dynamic balance tasks were the primary predictors of math and language achievements, such that better dynamic stability accompanied higher academic grades. However, employing stability performance ratios (e.g., blindfolded divided by eyes open) revealed that the ability to maintain static balance in the absence of visual information was the primary predictor of language arts.

Discussion and Conclusions: This study stresses the importance of examining children in their natural environment and of employing performance ratio scores in order to better understand the cognitive-motor processes underlying academic performance.

Small-Sided Games in Soccer – Physiological Response and Time Motion Analysis

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Soccer is one of the most played team sport games in the world and thereby of substantial interest by the scientific community. Small-Sided Games (SSGs) represent a training format in which the number of players and pitch area are reduced and different variables and rule modifications are applied. In the past, these games were mainly used to train and augment technical and tactical soccer competencies. Nonetheless, over the last decade SSGs have drawn larger interest by fitness coaches and are employed in training regimes. The aim of this thesis is first, to review SSGs efficiency for inducing adequate internal (HR, RPE, BL) and external (distance covered, high-intensity running and sprinting) physical stimuli; second, enhancing physical fitness; and finally, to examine the influence of specific variables that might alter players' responses. A search in electronic databases was done and a total of 70 studies were reviewed. The results from the literature confirm that SSGs produce an adequate internal and external stimulus and therefore, may be used as a fitness-based training which imitates the physiological stimulus of real game or generic fitness exercise methods, with a combination of technico-tactical and motion specific actions. In addition, it is suggested that small format games (2 a side and 3 a side) without goalkeepers and with coach feedback produce higher responses. Other variables (i.e., playing area and format such as rest ratio and rule changes) can also be applied to increase or decrease particular locomotion and an internal load response. Nevertheless, the quantification of exercise intensity by external load components might still be an issue since there is a lack of data regarding the most powerful actions (COD, ACC, DEC). SSGs are a very important tool in soccer training that can be addressed to achieve different goals at the same time. This might be of interest in modern soccer training, in which methodology, time and load quantification have an imperative role.

Using Midterm Student Evaluations of Teaching to Provide Actionable Results

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Student evaluations of teaching (SETs) are an important tool for assessing the quality of college instruction. Moreover, midterm SETs have repeatedly been shown to be beneficial as a tool for eliciting useful student feedback. In contrast to conducting evaluations at the end of the semester, administering midterm evaluations allows instructors an opportunity to manage the course expectations of the students, with the potential of increasing student satisfaction. Nevertheless, compared with the copious research on end-of-term ratings based on SETs, very little evidence-based research has examined methods for conducting midterm evaluations and comparing them across different courses, teachers, departments, and institutions. A qualitative method, the Bare Bones Questioning approach (Snooks, Neeley, & Williamson, 2004), was used to receive developmental feedback from 70 physical education students in three different courses. Comments were organized into categories representing the characteristics that make up high-quality teaching, such as organization, scholarly coverage, rapport with students, and enthusiasm. Future research should emphasize only those comments that can lead to improvement, in order to make student evaluations easier to perform and more beneficial. It is recommended that if the faculty administers SETs in class, they should do so at the start of the session because this conveys to the students that the SETs are a priority and worthy of class time.

Closing the Ethnical Gap: A Case Study from the Physical Education Realm

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Background: Multiculturalism is most commonly defined as the recognition of different cultural groups in an attempt to provide each group with opportunities to maintain and even strengthen its group identity (Alibhai-Brown, 2000; Berry, 1998; Bodi, 1996). In most academic institutions students come from different ethnic and cultural groups, and there they experience an intercultural meeting. However, the meeting between different cultural groups does not in itself create a significant multicultural reality. In Israel the vast majority of Jewish and Arab students on college campuses have never had any prior social interaction with the other group, since Jews and Arabs learn in separate school systems until the end of high school. A physical education college that includes both academic and physical activity courses has the potential to bring these groups closer together and to develop cultural sensitivity among its students.

Aims: To evaluate the effectiveness of a single physical education (PE) activity intervention to increase general cultural competence of third-year PE students.

Methods: A quasi-experimental study that used a convenience sample with an experimental group and a control group and pre- and double posttesting. The sample comprised of 99 third-year PE students divided into an intervention group (N = 30) and a control group (N = 69). Students in the intervention group prepared and delivered a four-hour sport activity event at two different Arab high schools in Israel.

Results: Students who participated in the PE intervention group scored significantly lower in the two posttests than the pretest and the control group in mistrust, anger, fear and feelings of disrespect towards the 'other.' Also 59.2% of the experiment group thought that it is important to have a similar activity in the future and that they would like to know more about the other culture.

Discussion: Research shows that frequent contact between different ethnic groups in the positive environment of an academic institution has the potential to bring these groups closer together and develop cultural sensitivity among the students. This is under the condition that the college takes multiculturalism into account and demonstrates cultural sensitivity in its educational content of programs.

Conclusion: In order to create a multicultural experience, the physical education college should consider offering more programs and activities to bridge between Jews and Arab ethnic groups and respectively affect the atmosphere on campus in general.

Motivational and Demographic Aspects of International Sporting Event Volunteers: An Israeli Perspective

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Due to the importance of volunteers within the sporting realm, and the fact that they undeniably play a fundamental role in the success of many sport organizations and events, there have been increased efforts to enlighten the factors that influence the motivation behind such deeds of volunteerism. The current study aims to make a distinctive contribution to this field by exploring the Israeli perspective of the motivation of volunteers who chose to take part in two large international sporting events, and by identifying factors related to distinct demographic variables. Consistent with some preceding studies, the volunteers in the present analysis primarily reported self-determined motivation. Our study found that while there are no gender differences in the motivation of volunteers, age is an important demographic variable. Extrinsic rewards and career orientation were highly valued in volunteers under the age of 25. At the same time, the community involvement factor was especially high in people over the age of 65. A promising direction for future research might involve looking at the cultural differences of volunteers, as researchers and practitioners continue to struggle in deciding how best to recruit, train, and maintain volunteers in the sporting context.

Metabolic Power May Be a Useful Tool for Monitoring Locomotor Load in Team Sports Involving Repetitive, Intermittent, Intensive Running Sprints

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Background: Global positioning systems (GPS) are regularly used by team sports where distance in a high speed zone (e.g. 5.5 m/s) and acceleration zone count (e.g. 3 m/s/s) are common metrics of locomotion workload. Many team sports consist of repetitive, short, intermittent, intensive sprints, which severely limits the ability of the above metrics to accurately measure running workload. To overcome these limitations, some sports GPS include the high metabolic workload distance (HMLD) metric, despite studies claiming its mechanistic unsuitability for this task. HMLD is the distance covered where power output estimated from velocity and acceleration/deceleration measures, exceeds a specific power output (e.g. ≥25 watts/kg).

Aim: We sought to explore the relationship between HMLD measured by a ViperPod GPS (STATSports Technology Ltd, Courtney Hill, NI) and the time to complete various intermittent repeated sprinting tasks common to game activities and testing protocols in a rugby union.

Methods: Elite rugby union players and physically fit university students participated in different types of maximal intermittent rugby-specific out-and-back shuttle run tests, ranging from 60 to 1440 meters. The shuttle run time and HMLD for each participant were plotted to determine the Pearson's correlation coefficient (r) between the two variables for each shuttle run. The shuttle runs (SR) were 60m (10-20m shuttle run), SR180m (15-30-45m), SR240m (20-40-60m), SR600m (10-20m x 10, each 10-20m starting on 60 sec repeats), SR900m (15-30-45m x 5 on 2 minute repeats) and SR1440m (20-40-60m x 6 on 2 minute repeats).

Results: Results for the shuttle runs were: SR60m, r = 0.85, sample size (N) = 170; SR180m, r = 0.87, N = 65; SR240m, r = 0.87, N = 144; SR600m, r = 0.88, N = 17; SR900m, r = 0.92, N = 13; SR1440m, r = 0.96, N = 24.

Discussion and Conclusion: The criterion measure of performance for a running task is time to complete that task. As such, one would expect any

measure that correlates strongly with participants' finish time in an intensive running task to be an effective predictor of running performance. HMLD has a strong relationship with time to complete intensive shuttle runs and distance commonly found in matches and fitness tests in rugby union. The longer the distance covered for the shuttle runs the better the correlation, with a very strong relationship (r 0.95) between time and HMLD for 1440m. From these results one could surmise that HMLD has the capacity to accurately monitor intensive running workload in rugby union where average match distances covered for the various player positions range from 4.5–7 km. It is also possible that HMLD may be an effective running workload monitoring tool in other sports where intensive intermittent running activities abound.

Your Partner Makes You Better: The Partner Interaction Paradigm in Conflict Training

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The preparation for physical and non-physical conflict in educational settings is part of many professions like the police, (Rajakaruna, et al., 2017), the military (Jensen, 2014) or emergency medical service providers (Gormley et al., 2016). Recent studies investigating conflict management programs, like police use of force training (Cushion, 2018; Renden, Savelsbergh, & Oudejans, 2016), suggest, that training has yet to be optimized to ensure transferability of skills from the learning to the criterion environment. Current research (Körner & Staller, 2017; Staller et al., 2017; Staller, Zaiser, & Körner, 2017) indicates, that representative learning design in conflict training is key with regard to that issue.

The current presentation argues to emphasize the interaction between training partners in physical conflict training (e.g. self-defence training) and to systematically develop the competencies of the training partners to practice in a representative way without comprising (a) health and safety issues and (b) motivation. We propose the Partner Interaction Paradigm (PIP) as a paradigm to develop, design and evaluate partner interaction in conflict training. Further directions of the PIP in various contexts of conflict training will be discussed.

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Participation in a Mamanet Mothers' Cachiball League to Promote Health and Social Capital

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Background: Much of the Israeli population does not exercise regularly and this lack of regular physical activity constitutes a risk factor for obesity and chronic illness (diabetes, heart and vascular diseases, cancer and more). Rates of women who engage in regular physical activity are especially low. Identifying ways to increase physical activity and healthy nutrition, as well as promote social norms of healthy lifestyles, are central to improving the long-term health of the Israeli population in general and of women in particular.

In recent decades, researchers have linked high levels of social capital with more desirable health outcomes, as well as with economic, social, and emotional benefits. It has been theorized that these associations are mediated by healthier behavioral patterns among communities and individuals with higher social capital.

The Mamanet Cachiball League is a competitive sports framework for mothers of school-aged children, and currently boasts around 16,000 participants across Israel from a range of socio-demographic backgrounds. The current study explores the effects of Mamanet participation on participants' health behaviors and on those of their families, with a specific focus on social capital.

Aims: To examine measures of social capital, quality of life, and health behaviors among league participants as compared with the control group; to investigate changes in these measures among the participants' families (versus control families); and to determine whether the length of time of participation in the league is a significant factor in these changes.

Methods: Data were collected from 1,000 Mamanet participants, and from 300 controls (mothers aged 30-50 who do not participate in Mamanet or in any other competitive sport). Family questionnaires were distributed to 70 families of Mamanet participants and to 84 families of controls.

Results: In the current cross-sectional survey, a strong association was found between participation in Mamanet and in desirable measures of social capital, quality of life, and health behaviors. Longer participation in the league was associated with more positive measures across all three indices.

Discussion and Conclusions: This study has identified high levels of social capital among participants and their families. Additional prospective research is needed to examine the long-term effects of participation in the Mamanet league, as well as to establish causality between Mamanet participation and higher levels of social capital, quality of life, and healthy behaviors. Our ongoing study which includes matched repeated measures will enable us to make a better estimation of the causality of these associations.

Urban Forest Health Intervention Program (UFHIP) to Promote Physical Activity and Reducing Risk Behaviors among Adolescents at Risk

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Background: Recent years have shown increasing use of the term 'adolescents at risk', describing adolescents who are or might be in situations of physical, mental, or spiritual danger. Inactivity and risk behaviors among adolescents have been gradually increasing in recent years, in Israel and elsewhere. The Urban Forest Health Intervention Program (UFHIP) aims to use physical activities to strengthen personal and social defensive factors and reduce risk factors among adolescents.

Methods: The UFHIP was implemented at the Hila Youth Advancement Center in northern Israel. Pre- and post-intervention questionnaires were administered at the center. Adolescents studying at the Hila Center who did not participate in the program served as a control group and completed the questionnaires concurrently. In total, there were 76 participants, 53 in the research group and 23 in the control group.

Results: The findings indicate that the UFHIP met most of its aims. A statistically significant positive change was found in the behavior of adolescents in the intervention group with regard to physical activity habits in a forest environment, reduced risk behavior patterns involving abuse of psychoactive substances, diminished reports of psychosomatic symptoms, and higher quality of life. No similar change was observed in the control group.

Conclusion: In light of the research findings, the UFHIP is an efficient program. It is recommended that the program be continued and expanded to other centers for the advancement of youth at risk throughout Israel, while increasing the variety and number of activities provided.

Energy Depletion by 24-hr Fast Leads to Compensatory Appetite Responses Compared to Matched Energy Depletion by Exercise in Healthy Young Males

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Background: There is a currently growing interest regarding the distinct effects of similar (iso-energetic) energy deficits induced by dietary restriction versus physical exercise on energy balance. According to the available evidence, food restriction will favor increased appetite feelings and energy intake whereas similar exercise-induced energy depletion will not lead to such energy compensations among both lean and obese individuals. Although intermittent fasting, as a newly popular weight loss strategy that consists of total daily energy depletion induced through food restriction, has been shown to favor increased appetite and energy intake on the following days, it remains unknown whether a similar severe daily deficit induced by exercise leads to such nutritional compensatory responses.

Aims: To compare appetite, energy intake and food reward responses to an energy depletion induced either by 24-h food restriction or an equivalent deficit with exercise in healthy males.

Methods: Twelve healthy lean males (21.5±0.5 years-old; BMI: 22.5±1.7kg/m²) participated. Body composition, aerobic capacity, food preferences and energy intake were assessed. They randomly realized three conditions: 1) no depletion (CON); 2) full 24-h energy restrictions (Def-EI); 3) exercise condition (Def-EX). Ad libitum energy intake and food reward were assessed at the end of each session. Appetite feelings were assessed regularly.

Results: Ad libitum energy intake was higher on Def-EI (1752±711kcal) compared to CON (1267±288kcal) (p0.05), with no difference between CON and Def-EX(1491±416kcal). There was no difference in the percent energy ingested from macronutrients. Hunger was lower on CON and Def-EX compared to Def-EI(p0.001). Satiety was higher on CON and Def-EI versus

Def-EX (P0.001). Taste Bias for Implicit Wanting, Food Choice, Explicit Wanting and Explicit Liking was lower after the test meals in each condition (p0.001). There was a significant interaction condition x time between CON and Def-EI for Food Choice Fat Bias (p0.05) and between Def-EI and CON (p0.01) and Def-EI and Def-EX (p0.05) for Explicit Wanting Taste Bias.

Discussion and Conclusion: While 24-hr fasting leads to increased energy intake in the following meal, increased hunger profile and decreased post-meal food choice fat bias, such nutritional responses are not observed after a similar deficit induced by exercise.

Sedentary Lifestyle and Childhood: An Ecological Approach

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Background: Nowadays reports about health problems due to inactivity have spread around the world (Botey et al., 2015; Patterson et al., 2018), however, a sedentary lifestyle has increased in every age, even among young children (Finn, 2002; De Onis et al., 2010; Cunningham et al., 2014). Studies have been conducted, but, the majority of them just look at correlations between variables without taking into account the complexity of the problem (Gabbart & Krebs, 2012).

Aims: The goal of this study was to unveil some aspects that need to be considered to face public health policy to increase Physical Activity (PA) for young children.

Methods: This study was based in the ecological design proposed by Bronfenbrenner (2005), that has been used in studies of child growth and development (Krebs, 2009) and investigated the Microsystem, Mesosystem, Exosystem and the Macrosystem. Data were collected through questionnaires with 197 teachers and 241 parents, in a randomized sample from five cities of the State of Tocantins, Brazil. Reports were also prepared from the National Survey of Health (2013), Population Census (2010), and Cities (IBGE, National Institute of Geography and Statistic, 2015).

Results: In the Microsystem it could be seen that both teachers and parents perceive that physical activity is important but they provided low frequencies of PA practice to their children. Mesosystem analysis showed a contradiction between frequency of PA in the school and home environment and a discrepancy between the opinion of the parents and the teachers related to the PA that was offered to the children. Exosystem revealed association among PA habits of parents and teachers and children's practice of PA. In the Macrosystem we identified that poor quality of early childhood education, lack of PA in the general population, unevenness of professional training programs and beliefs of adults have led to difficulties in offering PA to young children.

Discussion: The context analysis showed that PA for young children has not been valorized in practical actions although teachers and parents recognize its values for education and child development. This has limited the opportunities of choice and hampered the realization to strategies which reverse the low

levels of PA among preschoolers, and it may risk the development of children.

Conclusion: In order to face the risk of sedentary lifestyle we need to rethink the value of PA in society and it is necessary to foster an interest in PA in the daily life of children.

Effects of Low Laser Irradiation on Peak Power Muscle Performance and Recovery

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Background: Low level laser therapy (LLLT) was shown to improve tissue repair and regeneration, increase angiogenesis, reduce pain and inflammation, and stimulate the formation of new muscle fibers. The mechanism by which LLLT exerts its effect includes activation of mitochondrial enzymes results in an increased intracellular energy. The effects of LLLT on skeletal muscles was evaluated in humans and found to improve graded exercise test performance, decrease exercise induced pain, and improve muscle performance and recovery after acute exercise.

Aims: To evaluate the influence of LLLT, using B-Cure laser on: 1) maximal performance; and 2) recovery after fatigued exercise.

Methods: Sixty healthy physical education students, aged 20-35, were recruited to this double-blind cross over study. The study included two experiments. Each group of 30 participants performed two interventions with real or sham treatment: 1) measured muscle peak power and peak torque in 5 repetitions in knee flexion; and 2) measured muscle recovery after the induction of fatigue by evaluating peak power and peak torque in 5 repetitions of knee flexion.

Results: There were no differences between the conditions (real or sham treatment) regarding the total work ($F(1,28)=1.09$, $p=.31$), or peak torque ($F(1,29)=.056$, $p=.814$). Also, there was no effect of LLLT on muscle recovery as measured by total work ($F(1,27)=.16$, $p=.69$) and peak torque ($F(1,29)=.056$, $p=.814$).

Conclusions: LLLT applied for 10 min did not improve muscle function or muscle recovery after fatigue.

Immersive Physical Theatre: The Future of Dance Experience

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In the global age, when technology is inseparable from our daily life, and the way we interact and experience the world, the idea of being passive consumers of culture, as we sit passively in the theatre, seems dated. The current audience is overflowed with information and stimulations, requiring us to constantly devise our attention, and rapidly adapt to new ideas. It is only natural that theatre will develop in the direction of interactive dialogue with its audience, that is demanding an experience that matches its attention capacity. Immersive experiences are the forefront of the newly developed dance performances. These include pieces that not only present the audience with images and information that is consumed passively, but require the spectator to constantly make decisions and guide its own experience actively. Ygal Tsur is a dance artist and performer, who has worked with some of the top choreographers in the world. He has worked closely with the British immersive theatre company 'Punchdrunk' (Sleep No More, NYC and Shanghai) in London, taking part in creating their production of 'The Drowned Man' while portraying the main male character in the piece. In his lecture Tsur uses his extensive knowledge and experience working worldwide in the field of dance, to demonstrate through exclusive footage and video material, the unique world created by Punchdrunk, and other immersive dance companies. The lecture gives a sneak peek into the developing technologies and dance language of immersive physical theatre, and presents to the audience exclusive knowledge of the ideas behind it, the ways of devising materials for it, and the physical working process of the piece

Physical Therapy Treatment Once a Month versus Once a Week for Posture Improvement in Children and Adolescents who Suffer from Posture Problems or LBP

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Background: Lifetime prevalence of Low Back Pain (LBP) among children and adolescents ranges from 32% to 66%. LBP prevalence increases with age and among 17-year-olds it becomes equal to the prevalence among adults (Hill & Keating, 2010). Previous episodes of LBP predict future LBP attacks. Therefore, it is important to intervene at a young age, even prior to the first attack. Poor posture is one of the risk factors for LBP in children. Interventions focused on knowledge have not been effective in changing posture behavior, hence it is preferable to focus on physical practice in order to improve and prevent LBP (Calvo-Munoz & Gomez-Conesa, 2012).

Aim: To compare between physical therapy treatments once a week versus once a month, on postural behavior, thorax curve angle and LBP in children and adolescents with poor posture and LBP.

Methods: In this intervention trial 50 children and adolescents aged 10-18 years suffering from poor back posture, with or without LBP, were divided into two groups. Both groups received once a month personal meetings in which a daily program of home exercise was tailored. The treatment group received an additional group meeting once a week. The intervention program included physical awareness and practice for good posture, with additional flexibility, strength and muscle endurance exercises. We measured thorax curve angle using an Inclinometer smartphone application. Postural observation was conducted for measuring postural habits. Back pain and Posture Evaluation Instrument (BackPEI) assessed postural knowledge and behavioral habits. Parents completed a self-reported questionnaire assessing knowledge and ideas.

Results: Thorax curve angle improved in the intervention group from 39.18°±9.27° to 28.24°±6.81°p

Discussion and Conclusions: Physical Therapy treatment using practice in exercise and postural awareness improves thorax curve angle, LBP and postural behavior. Comparing once a month face-to-face training versus once a month and an additional once a week meeting, the latter achieved larger and quicker improvement of postural behavior.

Sensory Language (SDM) to Foster Empathy in Social Work Students

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Assessment and management of emotional situations are generally discussed in academic studies in the field of social work through verbal interventions, while the art of developing awareness to nonverbal feelings has yet to see widespread use. Sensory experience based on nonverbal communication and body language can highlight complex feelings and problems that the social worker confronts. The aim of this study was to examine the effect of an intervention of sensory body language using a modified Sherborne Developmental Movement (SDM) model, in a course for social work students. The course's multidimensional process involved cognitive and affective components of understanding and identifying thoughts, feelings, and emotional states of others. The intervention combined art activity and focusing to foster empathy among social work students in the group setting. Twenty social work students attending college in the north of Israel participated in the course, writing reflective diaries throughout the course, which were collected and analyzed. The findings suggest that sensory language and movement through the group experience enhanced social work students' empathy and their awareness of its importance for practice. Learning to be empathic through non-verbal communication also challenged perceived barriers to empathy such as cultural and language differences. The modified SDM model enhanced social work students' awareness of the importance of empathy using non-verbal communication as was recommended in Yogev's 'Development of Empathy in Group Analysis' model. The results of this study suggest that experiencing movement activity using the SDM in a group context enables the fostering of empathy among social work students.

The field of teacher education in sports education involves social aspects and therefore it is possible to learn from other areas of training that relate to social aspects, such as social work. Therefore, in the current study social work students may shed light on the contribution of Sherborne's physical activity to the development of empathy in professional development in academia.

Intervention to Promote and Affect Fundamental Movement Skills, Physical Activity and Cognitive Skills in Kindergarten Children

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Background: Fundamental Movement Skills (FMS) are developed during early childhood and build the prerequisite to learn more complex and sport specific movement patterns (Stodden et al., 2008) for lifelong engagement in physical activity (PA) which is essential for maintaining physical health and cognitive and social development (Haapala, 2013). Not only through natural maturation and physical development are FMS acquired, but more importantly through an external stimulus and constant interaction with the social and physical environment (Gabbard, 2009). A systematic review with meta-analyses (Wick et al., 2017) on programs to improve FMS involving 6126 kindergarten children showed significant positive effects among groups in favor of the intervention group. Unfortunately, the effectiveness of interventions needs to be interpreted with care as they are based on low-quality evidence and immediate post-intervention effects without long-term follow-up.

Aims: The aim of this study is to develop a complete and long-term FMS intervention program with high methodological quality. Intervention contents will focus on muscular strength integrating strength and skill-building activities. In addition, elements from children's gymnastics will complement the intervention. Primary outcomes are development of FMS proficiency and objectively measured physical activity. Evaluation of cognitive skills (concentration and attention) will be a secondary outcome. For descriptive analyses, anthropometric data (height, seat height, weight, and BMI) and socio-economic status of the parents will be assessed.

Methods: From the beginning of May until the beginning of July 2018 a 6-week pilot randomized controlled trial will be carried out comparing a strength and skill-building (children's gymnastics) program with an increase of time spent in physical activity (PA) to usual care (control group). Structured lessons of the intervention will be implemented three times a week for 30 minutes. Further unstructured PA will be offered daily (five times a week) for at least 30 minutes. Six kindergartens with children aged between 4-6 years are chosen based on similarities in resources, equipment and the socioeconomic regions from which they draw their children. FMS will be assessed by using four result-

oriented items. PA will be measured by using Actiheart accelerometers, and concentration and attention will be evaluated by using the Konzentrations-Handlungsverfahren für Vorschulkinder (KHV-VK). A questionnaire for parents will be used to assess the socio-economic status.

Results and Discussion: Significant and positive effects of the intervention program on FMS proficiency, time spent in PA and cognitive skills are expected. This study attempts to meet the requirements of a high quality study design in relation to results of the systematic review and meta-analyses by Wick and colleagues (Wick et al., 2017).

Inter-Relationships between Static and Dynamic Indicators of Knee Recovery versus Maintenance of Sports Participation 5-10 Years after ACL Reconstruction

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Background: A torn Anterior Cruciate Ligament (ACL) is the most common knee injury among athletes. In the United States alone there are 250,000 injuries a year which lead to high financial expenses and the inability of athletes to continue physical/athletic activity. In most cases, and especially in populations interested in resuming physical/athletic activity, treatment of the injury demands surgical intervention while even following reconstructive surgery of the ligament, a great risk of recurring injury exists.

Most injuries do not occur as a result of external physical contact (for example, with a rival player) but from dysfunctional movement patterns, lower limb asymmetry and insufficient technique while performing skills, such as landing after jumping, changes in directions and rotational movements. These causes create an uneven division of weight on the joints of the lower limbs, thus increasing the risk of injury.

Aims: Most of the studies on the topic examined one of the factors influencing limb function within a six-month to one-year time range from the reconstruction of the ligament. The study aims are to examine several factors influencing lower limb functioning after a period of five to ten years from reconstruction by analyzing kinetic variables, kinematic and strength measurements.

Methods: Thirty men after isolated autologous hamstring ACL reconstruction at the age of 18-35 years with a five-to-ten-year follow-up who didn't sustain re-injuries underwent dynamic knee evaluation. This included a knee extensors/flexors isokinetic test, time-to-stabilization, lower limb moments during the vertical drop test and the single-legged hop jump distance. Variables were tested by a three-dimensional motion analysis system (Vicon) combined with force plates and isokinetic dynamometer. A comparison was made between the operated limbs and the healthy limb results.

Results: In this work there were no significant differences between the limbs in the ability to perform functional tasks such as rapid stabilization, landings and bounces. There were significant differences in the benefit of the healthy limbs in all variables 60 degrees/second in the Isokinetic test.

Discussion and Conclusions: The injured limbs are characterized by a weakness in extensor and flexor muscle groups as opposed to the healthy limbs. In addition, it seems that the motion pattern of the injured limbs is different from that of the healthy limbs. In the injured limbs one can see a dominance of the hip joint in performance of tests as opposed to a dominance of the knee joint in the healthy limbs.

Lesson Planning Production and Assessment in Physical Education – Child's Play?

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Background: According to the literature, many teachers do not plan their lessons systematically. Yet teachers who do plan and regularly assess them are four times more likely to produce quality lessons in which learning takes place. Lesson planning is an issue in all school subjects, yet for physical education (PE) significant differences arise. It may seem 'easy' for PE teachers to improvise activities from various sports but with no structured process, such activities cannot be assessed to ensure that learning took place.

Training PE students to be teachers is more complex than teacher education in other subjects because of PE's multi-disciplinary nature, which requires mastery of many fields. Essentially, most PE students are exposed to only a few of the subjects during their teacher education process and lack the necessary content knowledge in the other subjects necessary for planning.

Aim: To create a systematic model for teaching lesson planning and assessment in order to assist PE students in planning lessons that are more effective and qualitative. The model should also serve them later on as teachers.

Model: A model using the Problem Based Learning (PBL) approach is produced as a final project. This serves as a scaffold that will facilitate independent lesson planning in the future. The project includes planning an annual curriculum and developing one full teaching unit. This project coalesces the cumulative knowledge amassed about planning during the teacher education process.

The final project entails a variety of sub-tasks according to the Learning toward Mastering principle. It must be completed before the pedagogical adviser gives final approval.

The project stages are as follows:

1. A prerequisite – writing a professional credo in Physical Education which must be illustrated during the project.
2. Gathering needed data and information about the learners and the conditions required for planning.
3. Using the official curriculum and compulsory sources – to select the objectives.
4. Based on stages (a) and (b), submitting a broad program including a

rationale, and an expanded teaching unit of 24 lessons including means for assessment.

5. Defending the plan in front of a team of peers for feedback, using a personal poster that includes the main points of the project.
6. Discussion and summary of the insights and recommendations in a class discussion.

In summary, the stages presented here include independent work and feedback from peers and the pedagogical adviser, until mastery of the project is attained.

Identifying Indicators in Pregnancy, Infancy and Childhood for Development of Probable Developmental Coordination Disorder

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Background: Developmental coordination disorder (DCD) (APA, 2013) refers to a chronic neuro-developmental condition characterized by a marked impairment in the performance of motor skills and activities of daily living, a deficit in physical activity, poor fitness and obesity. The prevalence of DCD ranges from 5 % to 6 % in all children. Little attention has been devoted to exploring the markers in pregnancy, infancy and childhood for the development of DCD.

Aim: To detect perinatal, neonatal and childhood variables which are significantly associated with probable DCD.

Methods: Parents who suspected that their child has DCD or that he/she has already been diagnosed with DCD, had normal-range IQs and showed no evidence of physical or neurological disorder nor a chronic illness, completed two questionnaires distributed in Israeli social networks: The Developmental Coordination Disorder Questionnaire (DCDQ) (Wilson et al., 2009) and a closed retrospective questionnaire including questions regarding perinatal, neonatal, infancy, childhood and background information . The 67 subjects, 31 boys (45%) and 36 girls (55%), from the age of five to 15 years old (M=9.0; S.D.= 2.67), were those whom their parents consented to their child's participation in the study, signed and returned the consent form and the questionnaires.

Statistical Analysis: The overall score for coordination was calculated for each child, and this grade was converted according to the age of the child to a dichotomous variable (with or without probable DCD). Of the 67 children, 23 (34.3%) were classified as having probable DCD (11 boys and 12 girls) and 44 (65.7%) were classified as typically developed children without probable DCD) (20 boys and 24 girls). An independent t-test was used to find differences between children with and without probable DCD for continuous variables and a chi square test was used for categorical variables.

Results: The results indicated that children with probable DCD had significantly lower scores in all the items of the DCDQ questionnaire compared to the scores of children without probable DCD. Also, the following indicators were found to be significantly associated with later development of probable DCD: Perinatal and postnatal history complications during pregnancy, eventful

delivery and Apgar score; in infancy – delay in the age of creeping; in childhood – falling and bumping into others or objects, difficulties in fine and gross motor skills and being physically inactive during leisure time.

Discussion and Conclusions: The indicators for the development of probable DCD detected in this study have clinical and practical implications for clinicians, parents and physical educators in facilitating intervention as early as possible for lessening the severity of DCD symptoms and for preventing the development of negative accompanying psycho-social experiences.

Performance Level of Ball Skills and Its Relation to Behavioral Socio-Emotional Adjustment and Academic Achievement

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Background: Proficiency in the performance of fundamental motor skills during childhood is significantly important for the social, physical, and psychological state and for wellbeing. The significance of the mastery of ball skills (e.g. throwing, catching) in childhood is specifically emphasized in research studies, since these skills are an integral component of many moderate and vigorous physical activities, playground games and sports.

Aims: 1) to examine the frequency of Israeli elementary school children who exhibit proficiency in the performance of ball skills in relation to those who exhibit borderline or definite impairment in the performance of ball skills; 2) to explore the frequency of children having a definite problem in behavior, socio-emotional adjustment and academic achievement in the group of children having a definite impairment in the performance of ball skills and to examine gender difference.

Method: Participants were 733 children, 359 boys (49%) and 374 girls (51%), aged 6.04 to 13.72 years (M = 8.82; S.D = 1.54), attending general education classes (1st–5th grade) from two public schools in Israel.

Statistical Analysis: The children were divided into three groups according to their level in performance of ball skills (without, borderline, definite impairment). They were also divided into two groups for each of the behaviors, socio-emotional adjustment and academic achievement variables, where the lowest 85% were defined as not having a problem and the top 15% were defined as having a definite problem. In order to determine if there were significant differences between the frequencies of socio-emotional and academic problems within the three different groups of ball skills, chi-square tests were performed.

Results: The results showed that 23.9% of the children had no ball problems, 61.5% were defined as borderline, and 14.6% were defined as having a definite impairment in ball skills. There was a significant difference between genders. Among girls, the frequency of ball impairment was found to be higher than among boys. Significantly higher frequencies of children with the best achievements in social skills, extroverted behavior, and hyperactive behavior were among children without ball problems compared to the other ball skills

groups. Only among boys, in the group of definite ball problems we found significantly (p0.05) higher frequencies of introverted behavior and loneliness.

Discussion and Conclusions: Many children in elementary school, especially girls, show a lack of control of ball skills. Boys in that group were found to be more introverted and lonelier. Among children who are proficient in ball skills, we may expect more energetic children who possess good social skills. Hence, it is significantly important to apply an early detection program for identifying children with difficulties in ball skills and to allocate time for adapted ball skill practice.

Clinical and Functional Comparison between Adolescent Dancers with and without Patellofemoral Pain

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Background: Patellofemoral pain (PFP) is common among young dancers. Currently, there is no clear indication as to which measures are most important in discriminating between young dancers with and without PFP.

Aim: To examine dancers with and without PFP for differences in anthropometric parameters, dance background and intensity, knee clinical assessment, dynamic balance, proprioceptive ability and lower extremity strength.

Methods: One hundred and thirty-two young dancers (mean age 13.4±0.9) from 7th grade (39 dancers), 8th grade (37 dancers), and 9th grade (56 dancers) were interviewed for dance background and intensity and were assessed for PFP. Anthropometric measurements (e.g. height and weight), physical examination (e.g. grinding test), dynamic balance (with the YBT-kit), proprioception ability (with the AMEDA-device) and lower extremity strength (with a hand-held dynamometer) examinations were performed.

Results: In total, 27 dancers (20.5%) were identified with unilateral PFP, 56 dancers (42.4%) were identified with bilateral PFP, and 49 dancers (37.1%) had no PFP. In 7th grade, dancers with PFP had significantly weaker hip abductors and weaker ankle dorsiflexors compared with dancers without PFP (p.05). The dancers with PFP in 7th grade had higher prevalence of positive grinding test and higher prevalence of positive patellar inhibition compared with healthy dancers (p= .038 and .007, respectively). In 8th grade no significant differences were found between dancers with and without PFP. In 9th grade, PFP dancers had longer leg length, they reported more h/week of dance practice in the previous year, and had worse proprioception ability and worse dynamic postural balance compared with healthy 9th grade dancers.

Conclusions: As PFP in young dancers may be influenced by morphologic parameters, dance intensity, strength deficits and lower postural balance and

proprioception ability, screening the young dancer for factors related to PFP is important in order to assist health care professionals in establishing effective intervention programs and preventative strategies, and hopefully reducing the risk for PFP.

A Statistical Review Based on the Research Dealing with Patellofemoral Pain in Young Dancers: A One-Year Follow-Up

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Background: Patellofemoral pain (PFP) is one of the most frequent injuries in young dancers. A previous study by Steinberg et al. (2017) tried to evaluate the prevalence and incidence of PFP in young dancers in a special dance program at school, and to characterize body morphology and anatomical alignment of those dancers who suffered from PFP. They screened 7th grade children and monitored them the following year (8th grade). In the second year, 89.6% of the dancers who participated in the research in the first year continued participation. Those seven participants who did not participate the second year left the program.

Aims: The aim of this study is to present the statistical advantages and the weaknesses of this research.

Results: In the first year (7th grade) the prevalence of PFP was 62.7% (50.0%-74.2%) while in the next year the prevalence was 85.0% (73.4%-92.9%). Yet, this cannot indicate anything about incidence because we cannot detect the number of new cases of PFP, or recovery rate from PFP of the dancers. The advantages of the follow up is the possibility to answer the following questions: 1) What is the rate of new cases What is the rate of recovery?

The number of new cases of PFP (an estimate of incidence) from which none recovered was 36.7% (25.3%-49.3%).

Major Statistical Issues: A known problem that arises when dealing with leg injuries is how to display the injuries? By foot or by dancer? In the literature researchers often present injuries per leg (in our research it means120 legs versus 60 dancers). Also, how do we account for pain? Is the pain specifically connected to the injured leg? In this case, the proper answer is to deal with each leg, but the legs are not independent, so how do we address this problem?

Conclusion: Statistics do not always have the answers to the questions raised by the researchers, but knowing and understanding what researchers are looking for makes it much easier to find the right statistical procedures.

Olympism and Nationalism – A Feasible Model of Conflict Types and Intensity: The Case of Israel

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Numerous studies in the field of international relations have been conducted with regards to exploiting international sports events for the purpose of states to promote political interests in the international arena. This study focused on another aspect of international sports events, which is their influence on defining the transnational identity of participating countries, using Israel as a case study. Often this influence is congruent with their national identities, and at other times, this influence conflicts with their national identities, and the ways in which these countries cope with this influence. The research addressed the Olympic Movement and its activities, as it is a movement with a philosophy based on the belief that it can educate people in its values through sports. Thus, the research aimed to examine the role of international sports events in defining transnational identity.

The research adopted a qualitative research approach (with a small quantitative section) and a case study. It was conducted in the years 2013–2014, in Israel and Lausanne, and collected evidence from official documents, and 26 participants associated with national and international sports events and politics. Content analysis was conducted to make sense of the data collected.

The data analysis yielded the SDTI (Sport Defining Transnational Identity) model that was developed in this research. The model points to an interaction that exists between an international organization that takes an active role in the international relations system of national organizations that are its members, and the society and government in which this organization operates. This interaction brings together and sometimes leads to conflict between the international organization's transnational values and the national values of its member organizations. The model points to a fluent and dynamic process in which each side influences and is influenced. The Feasible Model of Conflict Types and Intensity constructed in this research may enable identifying, in advance, the areas of conflict and their intensity by understanding the bottom line of each of the players and consequently define the playing field in which conflict can be conducted without breaking the rules. Contribution to knowledge was made by the SDTI model in the area of international relations from the point of view of defining transnational identity within the context of international sports events.

What Do Elementary School Children Say About Dance in School?

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Background: In recent years there has been an increase in the number of schools in Alberta offering dance as a distinct subject matter separate from physical education (Alberta Education, 2009; Robinson, 2008). Taught as a subject matter in its own right, dance education fosters an appreciation of dance as an artistic and cultural endeavor (Sansom, 2009).

Methods: This qualitative interpretivist study explored the experiences of 23 Western Canadian elementary school children between the ages six and 12 who participated in school-based dance education. Data collection involved two group interviews, children's art work, dance class observation, and researcher field notes. Data analysis followed interpretive thematic analysis procedures. The conceptual framework of place and space facilitated data interpretation.

Results: Data analysis resulted in five themes: 1) creative space; 2) a place where I can clear my mind; 3) a place for international and cultural expression; 4) practice makes perfect; and 5) collaborative space.

Discussion and Conclusion: Dance within an elementary school context provided these children a space within which they felt free to explore and discover creative means for self-expression and relieve stress. Within this space, children learned to accept the diversity of cultures and abilities in their classrooms and to collaborate with one another.

Enhanced or Diminished Expectancies in Golf Putting – Which Actually Affects Performance?

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Background: Motor skill learning can be improved when learners' performance expectancies are enhanced (Wulf & Lewthwaite, 2016). One theory that can explain the benefits of enhanced expectancies through psychological suggestion is the response expectancy theory (Kirsch, 1997). Response expectancies refer to 'the anticipation of one's automatic reactions to various situations and behaviors' (Kirsch, 1997, p. 69). For example, if a person expects to be successful, his/her behavior can change in a way that will indeed lead to success. However, it has also been shown that diminished expectancies can hinder performance (Chiviacowsky, Wulf, & Lewthwaite, 2012).

Aims: To examine whether performance expectancies enhance or diminish the learning of a putting task in golf. Our aim was not only to replicate a previous study (Palmer, Chiviacowsky, & Wulf, 2016), but also to add a control group with no circle around the target in order to assess whether a large circle around the target enhances putting performance or whether a small circle diminishes it.

Method: A laboratory experimental design with three groups: 1) a large-circle group (LCG); 2) a small-circle group (SCG); and 3) a control group (no circle around the target; CG). Based on group affiliation, the participants were asked to perform a putting task, hitting the golf ball to a target surrounded by a large circle (14 cm in diameter), to a target surrounded by a small circle (7 cm in diameter), or to a target with no surrounding circle. The participants completed a pretest of five putting trials, followed by five blocks of 10 putting trials each. Two days later, they performed retention and transfer tests consisting of 12 putting trials each.

Results: Absolute error was significantly smaller in the LCG than in the SCG and CG for the transfer task.

Discussion: Two complementary explanations can be put forward to explain how enhanced expectancies of success can improve performance: the effect of feedback and the effect of psychological suggestion on performance.

Conclusion: Putting performance was found to be facilitated by enhanced expectancies.

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Plyometric Exercise Improves Skeletal Muscle Contractile Properties and Jumping Performance in the Aging Population

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Background: There is a large body of evidence to suggest that aging, alongside muscle disuse negatively affects neuromuscular system functioning in humans (Aagaard et al., 2010). Different resistance training (RT) strategies are commonly prescribed as a viable tool to counter the above-mentioned age-related degenerative changes in muscle function. The underlying, widely accepted assumption is that the classical RT would lead to a greater muscle power output and consequently lower the risk of frailty in elderly. However, there has been a growing debate in the literature regarding the insufficient intensity of classical RT in efficiently preventing age-related atrophy and muscle fiber loss. Recently, Zubac and Šimunič (2017) showed that eight-week plyometric training (PT) in the adult population increased lower-limb explosive power for 12.2%, decreased tensiomyography (TMG) derived skeletal muscle contraction time in four (out of five) lower-limb muscles, 8.2% decrease in vastus lateralis MHC-1.

Aim: We tested the hypothesis whether PT can be used as a means to enhance muscle power output and contractile velocity (contraction time) in the elderly.

Methods: All data were collected before and after an eight-week PT (3 weekly sessions), with one-week rest after the fourth week of training. Using noninvasive TMG we assessed contraction time (Tc) and the maximal amplitude of radial displacement (Dm) in 23 participants (66.7±5.2 years), randomly allocated in the PLYO group (N=11) or control group (N=12). TMG was measured in five lower-limb muscles of the dominant leg: vastus lateralis (VL), biceps femoris (BF), tibialis anterior (TA), gastrocnemius medialis (GM) and lateralis (GL). The electro-mechanical efficiency (EME) of the GM was evaluated and calculated as a ratio between Dm and peak-to-peak M-wave amplitude (Paravlic et al., 2017). In addition, we measured muscle power output improvement via counter movement jump (C_{MJ}) and take-off velocity (V_V) on a ground force plate.

Results: C_{MJ} height and V_V increased by 14.2% and 8.2% only in the PLYO group (p=0.01). Tc decreased in the BF (-5.9%; p=0.028), GM (-9.6%; p=0.075). In the GL a non-significant decrease in Tc was observed (-28.9%, p=0.858), and there were no changes in Tc of the VL (p=0.233) and TA (p=0.360), and estimated VL MHC-1 proportion after PT (p=0.579). Dm decreased only in BF (-20.8%; p=0.031), while the EME index of the GM muscle improved by 23% (p=0.095).

Discussion and Conclusions: The present study supports the benefits of high-velocity PT training for improving explosive effort in the aged population. Lower limb explosive power, muscle contractility mechanics and EME efficiency and markedly improved in response to PT. This bears strong implications in terms of quality of life improvements throughout aging. The present findings may aid to develop countermeasures to attenuate the effects of aging on muscle function by designing novel exercise interventions for the elderly.

Poster Presentations

(Authors are in order of last name of the presenting author)

Matching Sports Field According to Personality

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Background: Matching for the several types of sports relies basically on children with extraordinary physiological and genetic characteristics, while the amount of attention that is devoted for the psychological characteristics of the individual is negligible (Abbott & Collins, 2004). Previous studies showed inconsistent findings in matching between personalities and suitable sports (Dolphin, O'Brien, Cahill & Cullen, 1980), and therefore this line of research was abandoned for years (Allen & Labrode, 2014). Recently, the Social Defense Theory (SDT) has extended the attachment theory by illustrating that each of the attachment styles – secure, avoidant and anxious – holds adaptive advantages and disadvantages which are expressed in different domains (Ein-Dor, Mikulincer, Doron, & Shaver, 2010). In a sport context, a longitudinal study that followed the official ranking of tennis players showed that players characterized with an avoidance attachment personality were more likely to achieve higher ranking since the demands of the game of tennis corresponds with their coping skills (Ein-Dor, Reizer, Shaver, & Dotan, 2012).

Aims: Study 1 examined the matching of the different types of attachment style towards an individual (tennis and judo) or team sports (soccer and water-polo). Study 2 examined whether an intervention to succeed in sport improves the matching to a specific sport, even given a lesser correlation between personal style and sport.

Methods: The study included two waves of research over one year. The young athletes completed a series of self-report questionnaires measuring attachment style (ECR; Experiences in Close Relationships; Brennan et al., 1998), extraversion–introversion dimension (BFI; Big Five Inventory; John et al., 1991), mental skills (OMSAT; The Ottawa Mental Skills Assessment Tool; Durand-Bush, et al., 2001), persistence (Duckworth et al., 2007), and enjoyment of the sports activity (PACES; Physical Activity Enjoyment Scale; Motl et al., 2001). The coaches reported the retirement rates and ranked the commitment, effort, and the discipline of their athletes.

Results: In study 1, according to the research hypothesis, those who scored higher on avoidance attachment personality showed a better matching towards individual sport and less success in team sports. In contrast, the anxious and the secure attachment personalities showed a long-term success

in team sports together with a deterioration over time in individual sports. However, as opposed to the hypothesis, study 2 showed that the participation in the intervention program was beneficial only for those with avoidance and anxious attachment personalities, but not for those with a secure attachment personality.

Discussion: The present study provides a significant layer of the overall picture of matching between people and sports and shows that the human personality determines a lot of success and commitment to the sport, to such an extent of creating an opposite effect in different kinds of sports.

Physical Activities of Teachers from Preschool and Their Provision of Physical Activities to Their Students

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Background: Early education has been considered one of the tools to reach optimal child development, and the number of children in preschools has increased in recent years. However, studies have shown that children have few opportunities to do physical activities (PA) in their schools (Olesen et al., 2013; Henderson et al., 2015; Botey et al., 2015). The low level of physical activity PA has brought negative projections about obesity, sedentary behavior, and motor deficits in children until the age of five (Trost, 2003; Dawson-Hahn et al., 2015). PA of children has been related to the physical practice of their parents (Loprinzi & Trost, 2010; O'Dwyer et al., 2012; Remmers et al., 2014), but such a relationship between teachers and their students is not yet known.

Aims: To verify the association between PA of teachers from preschool and their provision of physical activities to the students.

Methods: This is a survey research, with random sampling (N=197), from five cities of the State of Tocantins, Brazil. Data were collected from preschool teachers in classes with four-to five-year-old children. Questions were about sex, age, family income, subjects, personal physical activities and physical activities provided for the children. Statistical analysis was conducted. The Spearman test was used to check the correlation among the variables.

Results: A majority of participants were women (96%), with pedagogy degrees (76%), and similar income (US$221 to 1330/monthly) (70%) and were 39.9 ±8.4 years of age. Fifty-five percent of the teachers were PA practitioners, and 68% practiced for at least two years. Only 11% of teachers offered daily some type of PA for preschoolers. A statistical correlation was found between the practice of PA of the teachers and the offer of such activities to the children.

Discussion: The correlations found indicate the influence of teachers' habits in relation to physical activities offered to children. Teachers who practice PA also offer more practice opportunities for children. The low level of daily physical activities of teachers and children is contrary to World Health Organization minimum recommendations and may compromise child development.

Conclusion: The association between the frequency of PA of the teachers and

the PA that they offered to the preschoolers, both with a low rate, indicate that both of them can be at risk of a sedentary lifestyle and associated pathologies if remain unchanged. There is a need to encourage teachers to practice PA as well as offer it to children.

Integrative Swimming Instruction: Swimming through Understanding

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Background: In the past three decades we have witnessed a linear decline in children's motor skills, coordination and aquatic adaptation. Literature suggests that this is due to insufficient exposure to movement experience in the early developmental stages of life and insufficient exposure to aquatic environments. A brief literature review shows a growing use of integrative approaches in motor skills learning and in school teaching. Thus, it is hypothesized that similar approaches (i.e. Integrative) in swimming instruction (ISI) should be more effective than traditional swimming instruction (TSI) approaches that no longer relate to students' emerging needs.

Aims: To examine whether implementing an integrative approach to swimming instruction improves students' swimming level at the end of the learning period and affect their persistence in swimming classes after that period. The ISI approach is constructed as an evolving spiral process with inconspicuous transition between the cycles separated by goals and teaching methods.

Method: 148 swimming students in the age range of 4–8 participated in ISI classes over a period of two years. The control group included 164 same aged swimming students who participated in TSI two years earlier. All students were classified in the beginning and each month thereafter until the end of the learning period.

Results: It was found that 90% of kindergarten ISI students (age 4–6) managed to swim 50 meters (25 freestyle and 25 backstroke) in deep water compared to only 10% of the control group. Ninety percent of the control group swam 12½ meters freestyle and 12½ backstroke in shallow water. Further findings showed that elementary school ISI students (age 6–8) managed to swim 50 meters (25 freestyle and 25 backstroke) in deep waters compared to 60% of the control group. Forty percent of the control group swam 12½ meters freestyle and 12½ backstroke in shallow water. Finally, it was found that 90% of kindergarten ISI students and 60% of elementary school ISI students stayed for at least 1 year in advanced swimming classes compared to 40% of kindergarten TSI students and 30% of elementary school TSI students.

Discussion and Conclusions: In a changing world we need to seek out new and innovative ways to teach our children. We showed that new swimming instruction approaches can be beneficial in the short and long term. However, further investigation is needed to see ISI's contribution to swimmers' durability in swimming classes over longer periods of time and in their ability to excel compared to TSI swimmers.

Validation of an Assistant System for Motion Analysis in Equipment-Based Exercise Therapy

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Background: Due to demographic changes, an increasing number of orthopedic diseases is expected. This complicates the care situation in rehabilitation. Therefore, movement execution cannot be adequately controlled by the therapist (Lösch et al., 2018). In exercise therapy, strength exercises are an important component. For example, exercises on the cable pulley make it possible to train activities of daily living, but because of the degrees of freedom, they have a high potential for incorrect movement execution. Sensor-based assistance systems may support therapists and patients, but for an effective use in exercise therapy (Vergbrugghe et al., 2018), an assistance system must reliably detect movement execution.

Aim: The aim of this study was to compare the fault detection of a developed assistance system with a traditional visual fault detection of an exercise therapy expert, to check the usability in exercise therapy.

Method: Fourteen older adults (69.4±4.4 years) completed the exercise hip abduction on a cable pulley. During the exercise execution, the movement was recorded by a marker and contactless sensor system and movement quality was analyzed. This was done by a red blue-green sensor (RGB; Kinect 1.0), which was rule-based trained on the following error patterns: bent knee – BK, tilting upper body – UB, wrong plane – WP, hip rotated outwards – HO. The following rules have been set for the error detection: BK: measured knee angle165°; UB: angle between shoulder-center and left ankle, with pivot hip-center160°; WP: distance of the right ankle to the correct movement plane380mm; HO: realized by the foot position. Then, the movement was visually assessed by an expert. For the comparison between the assistant system and the expert, a four-fold table was used. In this process, the evaluation of the error patterns within the repetitions was based on this. Cohens k was used for analyzing degree of agreement occurring by chance.

Results: Sensitivity was defined as the degree of the matching error detection between the expert and the assistant system. For BK the sensitivity was 61.4% (Cohens k=0.213; p=0.001), for UB 76.2% (Cohens k=0.451; p0.001), for WP 75.7% (Cohens k=0.022; p=0.395), for HO 25.4% (Cohens k=-0.007; p=0.422).

Discussion and Conclusion: The present data indicate that there is insufficient agreement between the expert and the assistant system. Furthermore, the error detection works well for BK and UP, but not as well for WP and HO. Possible reasons can be the currently unimplemented filtering of detected error patterns within a repetition, the manual rule creation and faulty localized joint angles. This is due to the measuring principle of the RGB-sensor.

Acute and Chronic Effect of a Carbohydrate/ Branched Chain Aminoacids/Alanine Sports Supplement (Friliver® Performance) Intake on Perceived Exertion during High Intensity Interval Training Sessions

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Background: Branched Chain Aminoacids (BCAA), representing 35% of the essential aminoacids in the muscle, increase tissue proteins' synthesis during and after exercise and speed up the metabolism increasing cellular proliferation. Recent studies demonstrate that BCAA administration before endurance exercise improve psychological aspects connected to fatigue, especially in the recovery phase, with less perceived exertion.

Aims: The purpose of this randomized double-blind placebo-controlled study was to determine whether the intake of a branched-chain aminoacid/alanine (Friliver® Performance) affects the rating of perceived exertion (RPE) during high intensity interval training (HIIT) sessions.

Methods: Thirty-two healthy subjects (male = 20, female = 12, age: 21 ± 1.5 years) performed 36 indoor cycling training sessions over a nine-week period. Before (pre) and after (post) this training protocol, subjects were asked to perform a high-intensity endurance cycling test consisting of ten 90-second sprints ("SPR" steps) at 90% of individual maximal power (Pmax), separated by three-minute recovery intervals ("REC" steps) at 55% Pmax. One hour before the tests of each training session, the subjects of the experimental group (TR) ingested a single dose of Friliver® Performance while the subjects of the control group (PL) ingested a noncaloric placebo identical in taste and appearance. RPE (CR-10) was assessed during the HIIT test, ten seconds before the end of each step. Percent variations of RPE between TR and PL were then analyzed during pre-training SPR and REC steps and post-training SPR and REC steps. The Delta mean RPE (%) and Delta max RPE (%) were calculated.

Results: In the pre-training test, the Delta Mean RPE % (TR vs PL) was 1% during SPR HIIT and 9% during REC HIIT, with a Delta Max RPE of 5% and 15%, respectively. In the post-training test, after the nine-week physical training, the Delta Mean RPE % (TR vs PL) was 13% during SPR HIIT and 21% during REC HIIT, with the Delta Max RPE of 16% and 26%, respectively. Both single and long-term administration of Friliver® Performance significantly reduced RPE compared to placebo, with a 58% reduction in the REC phase between pre- and post-training.

Discussion: As compared to PL, Friliver® Performance significantly decreases RPE in the recovery phase as well as in the sprint phase of a HIIT training program, indicating a reduction in the recovery time and an improvement in potency.

Conclusion: Treatment with Friliver® Performance over a nine-week physical training significantly reduces mean perceived exertion of 13% (max 16%) during SPR steps and of 21% (max 26%) during REC steps. The results of our study suggest that a nine-week training program with Friliver® Performance intake may help athletes to sustain training and optimize their performance.

Avoidance, De-Escalation and Attacking: An Expert Coach Consensus in Self-Defense Practice

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Background: The overarching objective of self-defense training is to equip trainees with a set of skills that can be effectively deployed across a range of conflict scenarios. Self-defense training is a regular part of both police and military training; however, globally there appears little consensus or empirically informed practical guidance about the content of such training programs (Cushion, 2018; Jensen, 2014).

Aim: For self-defense coaches to reach consensus on 1) the characteristics of expert performance; 2) the potential scenarios and situational parameters trainees should be prepared for; and 3) the important elements of self-defense training.

Methods: Expert coaches in the domain of self-defense (N = 45) volunteered to participate in a Delphi Poll, which focused on the three objectives of the study. Criteria for the selection as an expert coach were applied as recommended by Nash and colleagues (2012). Sixteen coaches finished a total of three rounds of the poll.

Results: The members of the expert panel agreed: 1) expert performance in self-defense heavily relies on avoidance and de-escalatory behavior; 2) at the point of confrontation, perceptual-cognitive skills play a defining role; 3) training to defend punches, kicks and knife attacks from varying starting positions is crucial, independent of self-defense domain or gender; and 4) situational awareness, communication/de-escalation, decision-making and attack techniques are the most important elements of self-defense training.

Discussion and Conclusion: The study is a first important step towards helping self-defense and personal protection coaches identify expert performance in self-defense and to understand the broad range of skills needed to avoid, manage and resolute potential physical encounters. This will help in the development of an evidence-based view on curriculum development. The current study adds from the perspective of self-defense expert coaches, that

(a) the variability is the norm rather than the exception in conflict settings and (b) that learning to defend oneself encompasses a broad variety of skills (i.e., communication, de-escalation, situational awareness, aggression, etc.) that are seemingly more important than specific techniques against specific attacks.

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Using a Social Ecological Model to Understand Physical Activity among Jewish and Arab Adolescents in Israel: Findings from the Health Behavior in School-Aged Children Study

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Background: While Israeli youth typically take part in less physical activity (PA) than other countries, Bronfenbrenner's social-ecological model of family, school, and peer group influences on PA can have important implications for improving PA. However, there has not been research into how PA levels as well as the influence of Bronfenbrenner's model on PA may vary by sector (Jewish or Arab) and gender for Israeli youth, which has important implications. This study's objective was to assess differences in PA measures among Jewish and Arab adolescents in Israel by gender and analyze the relationship of Bronfenbrenner's social-ecological model and PA measures by sector and gender among Israeli youth.

Methods: This study analyzed the 2014-15 HBSC-WHO cross-national survey conducted in Israel among 16,145 pupils in 708 classrooms. Descriptive and multivariate analyses were performed to determine the association of family, peers, and school on three PA measures for two sectors (Jewish or Arab) by gender.

Results: Arab pupils were typically less active than Jewish pupils and girls less active than boys, but with differences by measure. Further, family, peer and school influences were associated with PA but there were variations by sector and gender.

Conclusions: Differences in PA levels exist by sector and gender among Israeli youth, which can lead to health inequalities. An understanding of the varying influences of the socio-ecological model can help tailor interventions to improve PA among different groups and potentially reduce inequalities.

Including Rhythmic and Expressive Activities in the Routine of Preschool in Piracicaba, São Paulo, Brazil

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Nowadays children are being brought early to school in order to reach better development. Studies have demonstrated an association between motor development and cognitive or social development, but studies have shown there are few opportunities for children to engage in physical activities in nurseries and preschool which can risk the global development of the children. Therefore physical activities in early education levels need to improve. The aim of this study was to implement physical activities in the routine of a daycare institution. It was done in a public daycare center at Piracicaba, SP, Brazil. The institution's coordinator, four teachers, 22 children between four months to five years old and their parents, took part in this study. Rhythmic and expressive activities were offered. The program's planning, implementation, and assessment were conducted with the teachers and the coordinator through weekly classes and meetings twice a week with the kids. Classes and meetings were recorded in a diary. There was no systematic motor activity before the beginning of the program and not even dedicated space for it. The results indicated that children had opportunities to perform basic motor skills, and to explore different aspects of musical rhythm. The children's parents reported being satisfied with the implemented changes in their routine and the children started doing these activities at home. Teachers reported that important relationships were established among the children. Exchanges between the Physical Education and Pedagogy knowledge provided an optimized environment to improve physical activities in such preschools. The implemented changes on the routine with the implementation of motor activities built a rich interdisciplinary experience which fosters in children perseverance for motor activities.

Body Awareness of Preschool Teachers and Their Work with Disabled Children

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The number of disabled children in regular preschools has increased but still many children do not receive appropriate care, and this may be associated with the teacher´s vision of the body. The aim of this study was to unveil the body awareness of nursery school children and how it relates to their work with disabled children. This is a case study carried out in a nursery school, in one city of the State of São Paulo, Brazil, with 26 teachers that had disabled children in their regular classes. Teachers were invited to speak about body awareness issues and their work with disabled children. The interviews were done with the analytical method of French discourse analysis. We found that there was a utilitarian body concept coupled with the functionality of the body as a machine, fit for work. For example, teachers reported, 'Our body is always good for something', 'I need to take care of my body more so that it has more durability, flexibility, quality and everything', or 'I understand the body like a machine that has to be working right so that we can do all our activities '. The body is thought to be productive and deficiencies disturb the state of affairs, although the teachers tried to give good opportunities for the disabled children to take part in the classes and to be 'accepted'. In their job with the disabled children we identified difficulties to deal with the difference, attempts to adapt as well as to hide the handicap condition. The possibilities of action and reflection based on differences and the role of the school as an agent of transformation in the sense of social equity are ignored. In conclusion, body awareness of teachers influenced their work with disabled children. Teachers tried to protect those children from discrimination by avoiding some kinds of activities instead of using the differences to create new possibilities and enrich the experience among the children. However, differences reflect beyond the characteristics of the children, their subjectivity and place in the world. Therefore, more body actions are needed with the teachers to re-think the possibilities of a disabled body.

Physical Activity Level and Profile of Patients with Cancer

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Background: Each year cancer rates increase all around the world. Data of the International Agency for Research on Cancer (IARC), estimated for 2030 a growth of 21.7 million new cases and around 13 million deaths (Globocan, 2012). It is known that lifestyle behaviors such as poor nutrition, smoking and physical inactivity can contribute significantly to developing certain types of cancer (Khan, Afaq; Mukhtar, 2010). It has been suggested that physical activity can act as a nonpharmacologic therapy to improve cardiovascular fitness, quality of life (Quist et al., 2012), strength and decreased fatigue (Cantarero-Villaneuva et al., 2013). However, physical activity levels of patients tend to decline after the diagnoses (Husebo et al., 2017), and in many cities the hospitals do not include such practice.

Aims: To evaluate the physical activity (PA) level of patients with cancer.

Methods: It is a cross-sectional and descriptive research, with simple random sampling (N=153) from outpatient cancer clinics in two hospitals at Piracicaba SP, Brazil. The inclusion criteria for this study was previous or ongoing treatment for cancer. Data were collected during patients waiting time to receive medical care. Questions included demographic characteristics and level of physical activities evaluated through the International Physical Activity Questionnaire (IPAQ).

Results: A total of 127 patients met the inclusion criteria established in this study, with an average age of 59.34±13.41 years, 75 (59.1%) females and 52 (40.9%) males. Seventy-one (55.9%) of the patients were included in the study during post-treatment care, 30 (23.6%) were undergoing chemotherapy, eighteen (14.2%) were undergoing radiotherapy and eight (6.3%) came to an appointment. The cancer types were breast cancer (26.8%); prostate (14.2%); gastrointestinal cancer (12; 9.4%); leukemia (11; 8.7%); head and neck (11; 8.7%); lymphoma (10; 7.9%); others types (24.4%). The mean score obtained by the IPAQ were 1280.2 Met's-minute/week, with a high standard deviation of 3849.78 Met's-minute/week. The majority of patients had a low level of PA (70%) and 22.86% did not report any PA. Among the types of cancers included in the current survey, the highest levels of PA were performed by breast cancer patients (15%), prostate (6%) and lymphoma (10%). The lowest levels of PA were performed by head and neck cancers (91%) and gastrointestinal (83%).

Discussion: According to the present results, the patients with cancer in

general had low levels of PA, which may vary between the types of cancers.

Conclusion: More studies are needed to check why the patients have not taken part in PA or in programs that benefit and encourage patients to increase their PA levels. Public policies are needed to provide places that can offer such activities with all the care that is needed.

Play Games in the Waiting Room of Cancer Units: A Preliminary Study

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Background: There are many kinds of cancer treatment but to receive any of them the patient must stay in a waiting room in the hospital ambulatories. Although medical caregivers need to offer a pleasant environment to the patients, the waiting room remains a place that can make the treatment even more difficult. One pleasant way to use the time is to play games, but the use of games in ambulatories for cancer treatment has not yet been reported.

Aims: The aim of this study was to check the acceptance of games in waiting rooms for cancer treatment. It was an observational, cross-sectional analytical study, with a randomized sample from two hospitals in two different cities in the state of São Paulo, Brazil.

Method: Patients were invited to fulfil a form with demographic data (sex, age, cancer type) and to take part in one of the following games: Checkers, Dominoes, Memory game, Tic-tac-toe, or Uno (American card game). Patients were asked about their feelings before and after the games.

Results: The group included 192 patients from 34 to 86.7 years old; 56% women. Skin cancer was the most common cancer type (47%), followed by breast cancer (21%) and prostate cancer (12%); 34% patients (N=65) accepted playing a game during the waiting time for medical procedures.

Discussion and Conclusions: Among those who decided to play there were patients from 40-87 years old, from both sexes, and with different cancer types. Although most of the patients refused to play, the results showed that playing while waiting for medical procedures is a way to improve the environment in hospital waiting rooms and can be practiced at any age and by both sexes, for different cancer types. The emotion most reported was joy, but fear and anger and surprise were also described. Only a few patients changed their emotion after the game, but in such a case, feelings of fear or anger were changed to happiness. Many patients refused to take part in the study, so it is not possible to say how they felt, and it might be they refused it because they

did not feel well. To play just once may not be enough to change the feeling inside of the waiting room. More studies are needed to understand why there is a resistance to play in the hospital, or to take part in research and studies should also observe the association between playing in the waiting room and the adherence to treatment.

Anaerobic Performance in Elite Czech Junior Ice Hockey Players: A Longitudinal Comparison over the Period of 2001 to 2017

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Background: Longitudinal studies in professional ice hockey players revealed substantial changes in anthropometric and physiological variable changes comparing recent data with those found in elite players in the 1980's and 1990's. For example, body height, body mass and aerobic and anaerobic performance indices show a gradual increase over the last decades in professional ice hockey players (Montgomery, 2006,; Quinney et al., 2008).

Aims: The aim of the present study was to compare anthropometric and anaerobic performance data in elite Czech junior ice hockey players over the period between 2001 and 2017 to reveal the possible tendencies in elite junior players, members of the top ice hockey league of juniors.

Method: Altogether 6132 junior ice hockey players aged 18 years participated in the study (at about 400 junior players every year). The testing always took place in the pre-season period and included anthropometry and a 30-s anaerobic Wingate test on a cycle ergometer Monark E824 using a breaking force of 6 $W.kg^{-1}$ that equals 0.106 $kg.kg^{-1}$. The main results were 5-s peak power [W, $W.kg^{-1}$], total work or anaerobic capacity [kJ, $J.kg^{-1}$], and fatigue index (FI). The development trend of the indices over the period 2001-2017 was calculated using a linear regression.

Results: The mean body mass and fat-free mass of the elite junior ice hockey players increased over the 17-year period from 77.71 to 80.18 kg (i.e. + 3.2 %, R^2= 0.73) and 70.16 to 71.88 kg (i.e. + 2.5 %, R^2= 0.32), respectively. Body height and body fat, however, did not change and corresponded to 180.7 cm and 9.8 % respectively. Absolute values of peak power and anaerobic capacity increased from 1117.4 to 1146.8 W (i.e. + 2.6 %, R^2= 0.36) and 26.17 to 27.16 kJ (i.e. + 1.7 %, R^2= 0.30), respectively. The relative values of peak power, however, did not change (14.3 $W.kg^{-1}$, R^2= 0.02) and relative values of anaerobic capacity slightly decreased from 344.0 to 339.4 $J.kg^{-1}$ (i.e. - 1.3 %, R^2= 0.46). Mean values of fatigue index increased from 39.97 to 40.97 % (i.e. + 2.5 %, R^2= 0.36).

Discussion and Conclusions: The results of the study indicate that body height, body fat and indices of anaerobic performance relative to kg of body mass in elite Czech junior ice hockey players did not substantially change over a 17-year period. On the other hand, body mass, fat-free mass and absolute

values of peak power and anaerobic capacity increased during the period between 2001 and 2017, similarly to the findings in adult professional ice hockey players.

Symposia

(Authors are in order of appearance in the scientific program.)

Symposium A

Mental Considerations in Athletes, Coaches, and Referees: An International Perspective

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In this symposium we present several aspects pertaining to mental preparation, mental skills, and underlying factors associated with performance of athletes, coaches, and referees. Specifically, Dr. Roy Samuel will initially present a study which examined self-control strength in 16 Israeli soccer referees. Referees completed measures of self-control trait and then over 2-4 matches each completed measures of daily hassles and self-control state (prior to and following the match). Results indicated high levels of self-control trait and state. A noticeable decrease (10% or more) in state self-control strength was evident in almost half of the matches. Experience of daily hassles and travel time to the match were related to lower pre-match self-control. Ego depletion was associated with self-reported match difficulty and was negatively related to self-rated match performance. These findings have practical implications for practitioners and Referee Unions for supporting referees' pre-match routines. Second, Dr. Itay Basevitch will present a study on imagery use and anticipation skills in 65 Croatian judo coaches of three professional levels. The coaches completed measures of imagery use and ability as well as their subjective coaching and anticipation ability. Actual anticipation ability was measured using the occlusion paradigm in which coaches watched clips of matches in judo stopped just before an attacking action by a judoka. Results indicated that high-level coaches rated their ability to anticipate and provide instructions higher than low-level coaches. They reported more control of the image when using imagery and used an internal perspective when viewing the videos of the judo matches compared to medium-level coaches. These findings showed that similar to athletes, higher-level coaches have higher imagery and anticipation abilities compared to lower-level coaches and have higher levels of confidence in their coaching ability in general. Third, Dr. Claire Rossato will present her applied work as a sport psychology practitioner with youth track and field athletes in the U.K. More specifically, she will discuss the use of mental skills training (e.g. pre-performance routines, imagery, and self-talk), and how these can be implemented with track and field athletes coaching sessions. Finally, Dr.

Roy Samuel will present a new model of the decision-making process for skilled soccer referees as well as initial data of a new type of simulator, designed to train soccer referees in sequential decision-making. He will conclude by providing practical considerations for effectively training decision-making in soccer referees, including the issue of technological aids.

Self-Control, Ego-Depletion, and Performance in Soccer Referees

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Soccer referees are challenged by physiological, professional, and mental demands which require them to exercise self-control for optimal performance. We applied the strength model of self-control (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998) to examine the relationship between self-control strength and performance. Sixteen Israeli soccer referees (M age = 30.06 yrs, SD = 7.38) representing several professional levels and experience completed a trait self-control scale. Then, over 2-4 matches each, they completed measures of daily hassles prior to the match and state self-control prior to and after the match. Personal, situational and performance indices were also collected. Data were analyzed using several statistical procedures, including hierarchical linear modeling. The referees exhibited higher levels of trait self-control compared with professional soccer players and the general population. Their state self-control scores were also high. A noticeable decrease (10% or more) in state self-control strength was evident in almost half of the matches. Experience of daily hassles and travel time to the match were related to lower pre-match self-control. Ego depletion was associated with self-reported match difficulty and was negatively related to self-rated match performance. These findings are in line with previous studies and the strength model of self-control. Practitioners should support referees in planning match day routines to maintain self-control strength, considering aspects pertaining to sleep, nutrition, and stress. Practitioners should also teach referees self-control skills. Referee Unions can assist referees in decreasing daily hassles prior to challenging matches, by announcing match allocation much earlier, so that referees can plan their work schedule, and by providing car services and even accommodation to referees who need to travel over a long distance.

Anticipation and Imagery Skill Level Differences of Judo Coaches

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The ability to anticipate what will happen next has been studied extensively with athletes (Mann et al., 2007). Studies have generally found that higher-level athletes are able to anticipate earlier and more accurately than lower-level athletes, which provides them with an advantage in the decision making process and subsequently in choosing the best decision. Furthermore, the use of imagery among athletes has been studied extensively (e.g., Bhasavanija et al., 2011). Findings pertaining to differences among skill level indicate that higher-level athletes have better imagery ability skills than lower-level athletes (Williams & Cumming, 2011). Limited research has been conducted on anticipation ability and imagery use among coaches. This is surprising since coaches have reported imagery use across sports such as basketball and gymnastics (Short et al., 2005). Furthermore, in many sports coaches need to provide instructions to players by understanding what happened and predicting what will happen next, i.e., anticipation (Ford et al., 2009; Grundel et al., 2013). Thus, the purpose of the current study was to examine imagery ability (e.g., vividness, duration, perspective) and anticipation abilities among low, moderate and high skilled judo coaches. Sixty-five judo coaches from a European country who have been coaching from 1-39 years (M = 11.74, SD = 10.27) and have competed for 1-45 years (M = 13.57, SD = 7.73) participated in the study. Coaches reported imagery use and ability during coaching on a 7-item imagery questionnaire (Razon et al., 2010). In addition, coaches reported their subjective coaching and anticipation ability. Actual anticipation ability was measured using the occlusion paradigm in which coaches watched clips of matches in judo stopped just before an attacking action by a judoka. Results indicated that high-level coaches rated their ability to anticipate and provide instructions higher than low-level coaches. Furthermore, higher-level coaches reported more control of the image when using imagery, and used an internal perspective when viewing the videos of the judo matches compared to

medium-level coaches. Findings showed that similar to athletes, higher-level coaches have higher imagery and anticipation abilities compared to lower-level coaches and have higher levels of confidence in their coaching ability in general. Future studies should examine the relationship between objective coaching abilities and imagery use.

Mental Skills Training with Track and Field Athletes

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Often, youth athletes have limited funding for sport science support, such as a sport psychologist (Schinke et al, 2012). Therefore, it may be important to equip coaches with some basic psychological skills so that they can work on these with their athletes. As a psychology practitioner working with many track and field youth athletes, a common concern of stress and how this impacts performance before competition is often raised (Raglin & Turner, 1993). It is shown in the literature that pre-performance routines can help aid performance (Jackson, 2003; Cotterill, 2011). Therefore, to help athletes deal with stress before competition, psychology practitioners could help develop pre-performance routines with athletes and coaches so that they can be applied within coaching sessions. The following presentation will discuss the literature surrounding the use of mental skills training, e.g. pre-performance routines (Cohn, 1990), imagery (Holmes & Collins, 2001) and self-talk (Hardy et al, 2004), examining how these can be implemented within track and field coaching sessions with athletes.

Decision-Making in Soccer Refereeing: Conceptual and Practical Considerations

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Decision-making is a critical aspect of soccer referees' performance (e.g., Helsen and Bultynck, 2004; MacMahon, Helsen, Starkes, & Weston, 2007). Referees must continuously locate themselves in a position, which enables a quick and correct capture of multiple static and dynamic cues (e.g., ball, players, lines) in a sometimes unexpected arrangement; all for generating reliable and trustful decisions (Lex, Pizzera, Kurtes, & Schack, 2014). At the elite level, referees interact, process, and make decisions under considerable stress (Samuel, 2015, Page & Page, 2010). Research on soccer referees' decision-making has emphasized the significance of contextual factors, such as the home advantage as manifested by crowd noise (Lovell, Newell, & Parker, 2014), a team's aggressive reputation (Jones, Paull, & Erskine, 2002), and the match's playing time (Unkelbach & Memmert, 2008). Furthermore, training of soccer referees' decision-making is typically conducted using a stationary video clip format (Schweizer, Plessner, Kahlert, & Brand, 2011) or an on-field simulation. Both types of training present shortcomings for training sequential decision-making in a form which simulates real refereeing performance. Therefore, in this presentation we first present a new model of the decision-making process for skilled soccer referees, based on Tenenbaum's (2003) sequential decision-making framework and the literature pertaining to soccer referees' decision-making (e.g., Mallo, Gonzalez Frutos, Juàrez, & Navarro, 2012; Mascarenhas, Collins, & Mortimer, 2002; Samuel, 2015; Unkelbach & Memmert, 2008). Then, we present initial data on a new type of simulator, designed to train soccer referees in sequential decision-making. Finally, we provide practical considerations for effectively training decision-making in soccer referees, including the issue of technological aids.

Symposium B:

High-Technologies for Sport Performance Enhancement

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Three presentations which explore the applications of high technologies in sport comprise this symposium. The first presentation is devoted to the use of video technologies aimed at enhancing the perceptual-cognitive skills (PCS) which precede response-selection and action execution. An overview of approaches designed for developing meaningful video methods to track and train players' PCS is presented. In the second and third presentations the authors introduce technologies which enhance visual attention and situational awareness, such as stroboscopic visual technology, eye-tracking glasses, 3-dimensional mobile object-tracking simulation (NeuroTracker) technology in a 3-dimensional environment, along with Dynavision attention enhancement technologies for performance enhancement practices. Some technologies allow measuring eye-gaze movements, and quiet-eye and post-quiet eye behaviors in situ. These are later contrasted with performance to determine the individual zone of optimal functioning. New prospects are explored to increase the usefulness and trustfulness of these technologies in emulating real-life situations. Together, the three presentations shed light on the recent technologies used in sport and safety domains for research and training purposes.

Using Video-Based Technology to Enhance Perceptual-Cognitive Skills across Sports

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There has been extant research examining Perceptual-Cognitive Skills (PCS) using video-based technology (Mann et al, 2007). Most of the research has focused on exploring skill level differences in the ability to anticipate, generate options and make a decision during scenarios of developing plays (Ward et al., 2008). Furthermore, studies have also investigated the underlying mechanisms (e.g., gaze behavior, memory/knowledge base) that provide experts the ability to perform consistently and successfully (Davids, Renshaw & Glazier, 2005). However, the transfer of knowledge gained from the research domain to the applied domain has been limited. Thus, there is a need to develop reliable and valid perceptual-cognitive measurement tools and training methods. We will provide an overview of approaches for developing meaningful ways to use video-based technology to track and train players' PCS. The approach is based on a longitudinal two-stage series of projects in which video based measurement and training methods are assessed across a series of sports (e.g., cricket, football, soccer, judo). In the first stage various measurement methods (e.g., varying the video content – spatial and temporal occlusion, and the response method – pen and paper, full body movement) will be explored in the aim of identifying the most reliable and valid tool. The second stage will be based on findings from the first stage. The measurement tool that will be the most reliable and valid will be used to track improvement over time and to identify the best PCS training method (e.g., implicit and explicit). Additionally, the use of: a) a real-world performance task, b) coaches' evaluation of development, and d) self-evaluation of development, will be explored. The overall aim is to develop video-based technology to improve PCS, and subsequently performance.

Integrating Technology and Psychological Skills Training in Athletes

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Technology enables measuring and training skills deemed imperative for sport performance enhancement (Williams & Ford, 2008). We introduce several technologies utilized in the Sport and Exercise Psychology Laboratory at The Florida State University, and outline their scientific foundation. In our presentation we emphasize enhancing the perceptual-cognitive components (Tenenbaum & Bar-Eli, 1993) and self-awareness/self-regulation model (Blumenstein, Bar-Eli, & Tenenbaum, 1997). Specifically, five technologies are presented and discussed: (1) Eye-tracking (SMI ETG-2), technology which allows for the evaluation and enhancement of gaze behaviors, (2) Dynavision (DynavisionD2) technology which matches a motor task with a cognitive task in order to enhance specific visual-attention and reaction time, (3) 3-dimensional mobile object-tracking simulation (NeuroTracker) technology designed to enhance visual perception and attention allocation in a 3-dimensional environment, (4) Physiological awareness and training by means of biofeedback (Thought Technology ProComp Infinity), which allows athletes to train and control physiological responses (e.g., GSR, HRV, EMG, etc.) using a self-regulation procedure, and (5) Stroboscopic glasses (Nike Vapor Strobe), visual-perceptual-technology to enhance athletes' anticipation and decision-making. Recommendations and restraints for the utilization of these technologies are discussed. Applications incorporating additional technologies, such as motion analysis and virtual reality for consulting, are also introduced.

Advanced Technologies for Performance Enhancement in Sport Psychology

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Perceptual-cognitive skills training provides a potentially valuable method for training athletes on fundamental skills, such as visual search, targets discrimination, anticipation, and decision-making (Ward et al., 2008). Several advanced technologies were found to target the assessment and the training of these skills in the sport arena. We introduce the utilization of four technologies deemed imperative for mental preparation: (1) Virtual Reality (VR) consisting of first-person perspective scenarios in which the athlete makes decisions while watching clear or occluded videos of their sport. The VR simulates actual game scenarios and has the potential to improve coincident decision-making in team sports (Gray, Cooke, McNeese, & McNabb, 2017), (2) Eye-Tracking technology which allows monitoring and training of visual cues, resulting in more efficient gaze behaviors in sports contexts (Feldman, et al., 2008), (3) Dynavision and the Fit-light technologies which engage the athlete in visual-motor tasks under time pressure. These enable training reaction time and peripheral awareness (Appelbaum & Erickson, 2016), and (4) Strobe glasses which present occluded visual input, resulting in increased ocular sensitization and improved visual skills under normal conditions (Appelbaum & Erickson, 2016). Overall, these technologies have the potential to facilitate decision-making processes and enhance performance. We present technologies which share scientific vigor and evidence along with domain-specific requirements.

Illustrations: Adapted Physical Activity Initiatives

(Abstracts are presented in order of last name of presenting author.)

Unique Initiatives in Adapted Physical Education for Students Diagnosed with Autism Spectrum Disorders (ASD)

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Gil is a special school for 100 students who are diagnosed with ASD, aged 12 to 21. They learn in classes according to their age and their function level: low, medium and high function. Students with ASD have noticeably abnormal or impaired development in social interaction and communication and a restricted repertoire of activity and interests. Abnormalities in the development of cognitive skills, sensory modulation, posture and body movements may be present. Helping students to achieve their highest potential in physical education requires both an understanding of ASD and its characteristics, and the elements of successful program planning required to address them.

The main objectives of physical education-specific initiatives are to enable students to be physically active as much as possible in order to increase their strength, flexibility, balance and co-ordination, and to improve their motor skills. In addition the activities are built in a way for developing social collaboration when working in pairs or in groups in order to enhance social ties.

In the workshop, the following initiatives will be displayed by applying a sample of the activities with the audience and by showing a movie of the programs.

Unique Movement Courses: The movement course is a closed skill with a definite mark for beginning and finishing the routine. In the course we combine auxiliary devices such as box jumps, rope hoops, benches and ladders which enable the students to climb up and over obstacles and thus improve the development of flexibility, power, balance, coordination and motor skills with success while they are concentrating on the activity without getting lost on the room.

Adapted Fitness Room: To ensure security a safe environment during exercises for the students with ASD, adapted devices have been developed such as tying ropes around their body and the treadmill, hiding operating buttons and speed that interfere with students staying on task. Also, we accompany each student activity on a device. For elevating the students' motivation we play music.

'**Snuzelen' Stimulus in the Gym**: Applying creative lessons by combining lights in a dark room and exercise in the dark. Activities in a darkroom with colorful

lights is a helpful way that focuses the students, makes them curious, and raises their enthusiasm so that they can sustain the activity.

Swimming Pool in the Playground: The pool is built by using a parachute, benches and water. An improvised pool in the playground has many of the benefits of a regular pool. The students splash around in the water during the hot summer days, and in that way the school also saves money.

Unique Initiatives in Adapted Physical Education with Students Diagnosed with Intellectual Disabilities

Liliya Lechtman

Galim Special Education School, Hadera, Israel

The Galim School philosophy is based on the belief that individuals with disabilities have the right to receive the maximum benefit from physical education. The adapted physical education program is dedicated to providing positive movement experiences and opportunities for individuals with disabilities to acquire and enhance motor, cognitive, and affective behaviors. Over the years, unique initiatives have been developed and applied in the Galim adapted physical education program to enable equal access to a healthy lifestyle and active leisure pursuits for the school students.

In the workshop, the following initiatives will be displayed by implying a sample of the activities with the audience and by showing a movie of the program:

Adapted speed stacking: Speed stacking, is an individual, couples and team sport that involves stacking nine or 12 specially designed cups in pre-determined sequences as fast as you can. The cups are specially designed to allow for faster times. Participants of sport stacking stack cups in specific sequences, by aligning the inside left lateral adjunct of each cup with that of the next. Sequences are usually pyramids of three, six, or 10 cups. Players compete against the clock or another player. Other than having pleasure and a unique leisure activity with peers from special and regular schools, by speed stacking the students learn cooperation, and develop reaction and movement time, ambidexterity, arm fitness, eye-hand coordination and enhance their attention.

Adapted Mayumana: Mayumana is an Israeli dance troupe that combines dance, song and percussion. The Mayumana show is performed by using instruments, voices and bodies to create a visual smorgasbord of dance, movement and theater. The rhythmic dance is performed by the dancers also with drumming on boxes, buckets and floors with their hands and feet. In the adapted dance we also use fit balls with drumsticks, drumming on cans and so on. By applying Mayumana the students improve memory, coordination, rhythm, hand-eye coordination, imagination and drumming techniques.

Adapted Dance Corps: We find in every child the potential and capabilities which are inherent in him/her. Students have the opportunity to not only enjoy the assembly, but to learn valuable lessons about cultural competence.

The more the students are aware of the following themes, the more they will be able to enjoy—and learn from—the dance performance: cooperation; communication; personal expression/creativity; interdependence. We adapt the dancing by using different accessories and by dancing in different styles. By dancing, the students improve coordination, imitation, short-and long-term memory, creativity, self-confidence and body awareness and their movement ability. In classes we prepare dance performances and display them in school and in the community.

'The Olympics' at the Agam School for Special Education

Ofir Schonwetter-Lazar

Agam School, Ra'anana, Israel

The Agam School for special education is under the supervision of the Ministry of Education, and was a recipient of the National Education Award in 2015. The school won a regional education award this year and is a candidate for the National Prize. The school is attended by 95 students aged six to 21 years, with a range of disabilities, including physical disabilities, autism and other rare syndromes.

The Agam School is recognized by the Ministry of Education as a permanent school in the field of health promotion, which is the highest designation. The school staff believes in promoting health from a global, social and ecological perspective. Physical education and physical activity are an important part of the school's educational and therapeutic worldview. Students with complex disabilities are challenged with physical activity that is adapted to their skill and grade levels, whether as a group or individual participant.

National physical education week is held once a year and holds a peak day for the Olympics, culminating in an educational program called World Experience, where students learn about different countries. Each class will embark on an educational trip at the beginning of the year. Preparations for peak day and the Olympics include a work program for physical education teachers in which they train students in a variety of sports. For each of the 12 classes of the school, a sport is chosen for the country they are studying. In the main ceremony, students are required to present what they have learned according to their functional capacity.

In order to give the show a competitive dimension, guest judges from the community are invited. The judges are former and present Paralympic athletes and representatives from the sports world, for example, Ester Roth Shachamarov, Moran Samuel, and others from the Academy of Physical Education and Special Education.

Judging is done according to pre-defined criteria. At the end of the competition, the referee gives the trophy to the winning class.

This year, in celebration of the 70th anniversary of the State of Israel, the school chose to hold a salute to the World Maccabi movement and to hold the Maccabiah Games in the place of the Olympics. The winners of the gold medals are Itzik Meistbalov and the Vice-President of the World Maccabi Movement, Roy Hessing.

In the presentation you can see matches in sports. Assistive devices utilized to help students include a bocce ball rolling device activated by pressing a switch, the use of a flashlight for the visually impaired, and a wheelchair connected basketball system, among others. Also students from standard education are invited, and make it a significant learning experience.

Workshops

(Abstracts are presented in order of last name of presenting author.)

Making a Long Story Short: A Practical Workshop for Using Anecdotal Stories to Facilitate Mental Skills among Athletes

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Stories have been a form of communication since ancient times. Even the holy Bible, one of the oldest books in history, is based on oral stories that were passed from generation to generation. The usage of narratives as an educational tool was recognized by the Argentinean psychotherapist Jorge Bucay, who has published several books on this matter (e.g., Déjame que te cuente, 2002). Therefore, the purpose of this workshop is to introduce the concept of using short and anecdotal stories as a valuable and unique tool that sport psychology consultants can utilize when presenting, exemplifying, and discussing mental skills and aspects with athletes. The workshop will be comprised of two active stages. At the first stage, groups will be formed and stories will be distributed. Each group will then discuss amongst themselves means to facilitate mental skills in athletes by incorporating ideas from their specific story. During the second stage, groups will exchange stories as well as views pertaining to how these stories can serve to enhance their work with athletes. Furthermore, workshop attendees will be encouraged to share additional stories through which mental skills can be demonstrated or facilitated in individual or team sessions.

Workshop: Prenatal and Postnatal Pilates – Theory and Practice

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Pilates City, Tel Aviv, Israel

Research has attempted to describe intra-abdominal pressures (IAP) generated during Pilates Mat and Reformer activities, to determine whether these activities generate IAP above a sit-to-stand threshold. Findings support recommending a series of introductory Pilates exercises including five Mat exercises and six Reformer exercises to women desiring a low IAP exercise routine (Coleman, et al., 2015).

Based on these research findings, IAP exercise routines can be adapted for pregnant women. In the workshop participants will learn about and practice the following:

- Integration of prenatal women into Pilates group lessons and private sessions
- Adjustments of the exercises according the trimesters of pregnancy
- Breaking myths – what is permitted and what is forbidden during pregnancy and whether there is such a thing
- Adapting exercises to the physical and mental state of the pregnant woman
- Using Pilates accessories and adaptations for the pregnant woman
- Post-natal, what are the correct exercises for rehabilitation after birth
- The important issue of diastasis recti abdominis (DRA)

Workshop: Abdominal Muscles – Role, Function and Conditioning from an Integrative Perspective

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When our clients develop a more optimal and efficient posture and movement strategy and develop core strength on top of this strategy, they have the keys to successfully and safely relieve chronic tightness, discomfort, and to progress towards achieving their health and fitness goals. There are really no secrets. Just follow the basic principles:

- Teach your client **how to breathe** with the diaphragm and stabilize their thoraco-pelvic canister.
- Teach them how to control a neutral spine and achieve a long spine.
- Progress them through the fundamental movement patterns.
- The most important system except the nervous system is the respiratory system due to its control over the intrinsic pressure system between the chest cavity and the abdominal cavity. This pressure maintains the stability and the control of the core muscles, especially the transverse abdominis, the pelvic floor, the diaphragm and the multifidus. The scalenie and the sternocleidomastoid which control the alignment of the neck are also related to breathing, so we use breathing as part of the practice of the abdominal muscles.
- We are not just strengthening muscle endurance, but we are also activating it, working on the coordination of the neuromuscular system. We address the abdominal muscles not as a separate group, but as a part of the core muscles around the torso.
- There is no one ultimate abdominal exercise!!!
- Train the abdominals in the manner in which they are designed to function in their role: in developing intra-abdominal pressure and TPC stabilization; in stabilizing the thorax over the pelvis; and the pelvis under the thorax.

We must remember that if we don't first change wrong breathing and movement patterns, even the 'best' abdominal exercises won't achieve their goals but will only strengthen those wrong habits. As long as the torso will act in the right timing and load, our functional control of the limbs will be more

effective and less overloading. Once we prove to clients and patients that performing only crunches and similar exercises can actually de-stabilize their spine, they wonder what they can do to 'strengthen' their abs. This workshop will show you that there are other more efficient ways to get a strong, shaped and healthy core!

'Core strength' refers to being able to brace the body's center against external forces, as well as engage this region to produce forces. At the root of every exercise is the activation of one's core. Core activation is also important in functional training, as it is used in almost every full-body movement. In additional to the basic principles and ideas of functional training, session participants will learn core strengthening exercises that can be implemented in every strengthening program.

A Workshop Presenting a Physical Activity Internet Site for Frail Elderly and Their Caregivers

Mor Weinstein, Esther Argov, Yael Netz

The Academic College at Wingate, Netanya, Israel

The site is a part of a project funded by the European Commission. The site is available in Hebrew, English, German, Bulgarian and Greek.

The aim of the workshop is to present this e-learning platform. Interested caregivers, social organizations and social care professionals will have the opportunity to be trained on-line. The idea is that caregivers working with frail elderly will implement physical activity as an integral part of home care services. The WHOLE project aims to aid in the overall prevention of functional decline and frailty among older people.

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