ICSSPE

International Council of Sport Science and Physical Education
Conseil International pour l'Education Physique et la Science du Sport
Weltrat für Sportwissenschaft und Leibes-/Körpererziehung
Consejo Internacional para la Ciencia del Deporte y la Educación Física

Bulletin

Journal of Sport Science and Physical Education

No 69, October 2015

Feature: Research Methodology

ICSSPE/CIEPSS Hanns-Braun-Straße, Friesenhaus II 14053 Berlin, Germany, Tel.: +49 30 311 0232 15, Fax: +49 30 311 0232 29

Table of Contents

PUBLISHER'S STATEMENT

No. 69, October 2015, ISSN 1728-5909-69

The Journal of the International Council of Sport Science and Physical Education (ICSSPE) is published twice a year. Its goal is to provide a forum for ICSSPE members and other contributors to share news and experiences, raise issues for discussion, develop international and external links and promote events. The featured articles and other contents are monitored by the ICSSPE Executive Office and the Editorial Board, with the aim of allowing for free and balanced dissemination of information consistent with ICSSPE's aims and objectives. The views expressed within this publication are not necessarily those held by ICSSPE unless otherwise stated.

The Journal is published by
International Council of Sport Science and Physical Education (ICSSPE)
Hanns-Braun-Straße, Friesenhaus II, 14053 Berlin, Germany
Phone: +49 30 311 02 32 10, Fax: +49 30 311 02 32 29
icsspe@icsspe.org
http://www.icsspe.org

Editor: Katrin Koenen
Text-Editor: Dr Richard Bailey
Design: Astrid Lange

The Executive Office is supported by the *Senatsverwaltung für Inneres und Sport*, Berlin and by the *Bundesministerium des Innern*, Germany, based on a decision of the *Deutsche Bundestag*.

FOREWORD

Editorial

Katrin Koenen

Welcome to issue No. 69 of the ICSSPE Bulletin, which provides a Special Feature on "Research Methodology". The feature contains a selection of articles, looking at the topic from different ankles and offering also an overview on the most important literature. On behalf of ICSSPE I would like to thank Herbert Haag as editor of the special feature for his commitment and dedication throughout the editing process. Herbert Haag is Professor emeritus at the Christian-Albrechts-University of Kiel and a longstanding member and advisor of the ICSSPE Editorial Board. I also want to give thanks to all authors that have provided articles and make it thereby so diverse.

In our current issues section you will find a sequel article to Richard Bailey's article: "Learning to Move, Moving to Learn? What is the relationship between physical activity and educational success?", which was published within the last edition. The new episode is called "Healthy Body and a Sound Mind? Does physical fitness improve cognition?", and I hope you enjoy reading. In addition, you will find as usual a compilation of recent ICSSPE news.

What else have we done: ICSSPE just held a bilateral German-Israeli Symposium in Berlin, during which Israeli Minister of Sport Miri Regev, and German Parliamentary State Secretary Ole Schröder have agreed to intensify their long-standing relationship in Sport. Government members and participants of this symposium, held on the 8th October 2015, looked back at 50 years of diplomatic relations between the countries and devoted the second part to a number of current issues in sport politics, such as the usage of sport for development programmes, necessary steps to advance participation opportunities for all, the need to support sport with nationwide programmes, as well as the protection against corruption, illegal betting and match-fixing.

Preparations continue for our Sport in Post-Disaster Intervention seminar which will be held in Rheinsberg, Germany, in November. We expect an international mixture of participants and are pleased that many people from developing countries have registered. Speakers and participants come from a range of different disciplines including disaster management, medicine, physiotherapy, physical education and occupational therapy.

At the same time a bilateral German-Chinese Symposium will be held in Shenzhen. Organised by ICSSPE, the General Administration of Sport of China and the Federal Ministry of the Interior, Germany, will meet with official delegations - composed of sport scientists, practitioners and politicians - during the China Cup, to discuss current issue in sailing, fencing and equestrian.

Preparations for ICSEMIS 2016 – the International Convention on Science, Education and Medicine in Sport - are developing very well, and all important information can be found on the website http://www.icsemis2016.org/ or of course on the ICSSPE website.

And last but not least, we are happy to announce our new publication in the Perspectives series: 'Elite Sport and Sport-for-All', edited by late Margaret Talbot and Richard Bailey. The publication addresses a central dichotomy in sport policy and provides informative insight for students, researchers, policy makers and administrators working in sport development and policy. ICSSPE members will be able to order the book with a reduction of 20 percent!

Finally, I would like to remind you that contributions for the Bulletin are always welcome, whether you would like to submit an article, a review, or report on a meeting or conference, introduce a new research project or university programme. Feedback on the format, or any aspect of the Bulletin, is always appreciated.

Please email me at kkoenen@icsspe.org.

Enjoy reading!

Katrin Koenen
Director Scientific Affairs

President's Message

Uri Schaefer

Hello everybody,

I am delighted to inform you that ICSSPE meetings in Brazil, at the Federal University of Juis de Fora, which were held between 12th – 14th September, were very meaningful and successful. The two days of deliberations were very intensive but equally deep, comprehensive and educational for all of ICSSPE organs, namely the President's Committee, the International Committee for Sport Pedagogy (ICSP), the Editorial Board, Executive Board, and Associations Board and, for the first time, the International Scientific Network of Sport for Development. After the successful meetings, ICSSPE members joined the Latin American Association for Sport Science, Physical Education and Dance (ALCIDED) Conference, which was interesting and shed light on specific topics of concern in South America and at the same time discussed the world's shared concerns in regard to children's and youth's insufficient physical activity.

We were hosted wonderfully and we received a real taste of Brazilian Culture. We cannot thank the hosts enough for welcoming us with open arms and leaving us wanting more.

During our 3rd day we visited Rio and its exquisite landmarks, such as the world famous Stadium, the Maracanã (the stadium which will host the opening ceremony of the Rio Olympics in 2016 and was one of the host stadiums in the 2014 Mondial), Copacabana and other breathtaking beaches where futsal and volleyball pitches are very common, Christ the Redeemer statue and many more. It was, and still is, our pleasure to deepen and strengthen our ties with people in South America in general, and Brazil in particular, who have helped us with preparations for the upcoming ICSEMIS 2016 event, which will be held at the University of San Paolo, in Santos Brazil. The event is traditionally organized by the IPC, ICSSPE and FIMS, in co-operation with the host University and aims to share new initiatives and disseminate scientific and professional up-dated information in the fields of Sport Science, Sport Medicine, Physical Education, and related fields.

ICSEMIS will take place between the Olympic and Paralympic games from 31st August to 5th September 2016. The opening lecture and the keynote addresses will have simultaneous translation in English and in Spanish. We anticipate 2,000 participants from South America and around the world, and are currently intensively advancing preparations, which are spearheaded by ICSSPE Executive Director Detlef Dumon and ICSSPE Director of Scientific Affairs Katrin Koenen. More information will be soon available on our website

It is important to note that prior to ICSEMIS , between 29th - 30th August 2016 ICSSPE will hold its Board meetings and General Assembly, during which elections will take place. More information such as vacancies in each of ICSSPE's Boards will be provided in due course to all ICSSPE members, according to ICSSPE statutes.

Apropos of elections, I would like to welcome Prof. Dr. Filip Mess as our new member in the Editorial Board. Prof. Dr. Mess replaces Dr. Richard Bailey who ended his term in the Editorial Board. I would like to express

our thanks and appreciation to Richard for his valuable contribution to the Editorial Board as well as for his important work now at our headquarters in Berlin.

A few months ago ICSSPE published a new book titled: "Elite Sport and Sport-for all, bridging the two Cultures?" Edited by Richard Bailey and the late Margaret Talbot. This publication is part of the multi-disciplinary series of Physical Education and Sport Science and presents different and up to date approaches of the relationship between the two domains.

On a different note, the German-Israeli symposium on Opportunities and Challenges in Sport was held in Berlin between the 7th and 8th of October, as part of the Bilateral Agreement between The Ministry of the Interiors, Germany and the Ministry for Culture and Sport, Israel and to mark the 50th anniversary of the German Israeli Diplomatic relations. The selection of the Symposium topics included the values of sport, sport policy emphasizing gender and equality in sport, access to sport as a fundamental right for all – a worldwide challenge, sustainability in sport development, sport infrastructure. ICSSPE's role in organising the event was significant valuable and was appreciated by all participants.

Prior to the opening ceremony, the Israeli Delegation visited both the Jewish Museum in Berlin and the Gleis 17 Memorial train station. Needless to say, the visits were emotional and touching.

All in all, the symposium was a success. ICSSPE is looking forward to continue co-operating with both Ministries in the near future in order to begin planning the next symposium.

While writing this we are a week away from the 5th Bilateral German-Chinese Symposium of the Federal Ministry of the Interior, Germany, and the General Administration of Sport of China, organized in co-operation with ICSSPE. It will take place from 30th October to 3rd November 2015 in Shenzhen, China. This year the emphasis will be on knowledge exchange in the areas of sailing, fencing and equestrian. I hope, and know, the deliberations will be fruitful and successful for both parties.

Towards the end of 2015 I would like to use this opportunity and wish each and every one of you, ICSSPE members, a healthy successful and prosper 2016. May this coming year be a peaceful year and we all will go from strength to strength.

Yours in friendship

Dr Uri Schaefer

Welcome New Members

ICSSPE welcomes the following new members:

A045-3
Physical Education Institute of South Africa (PEISA)
South Africa

B146-1
International Association of Kung Fu Toa 21
Finland

C063-3
Queremos Mexicanos Activos A.C.
Mexico

C121-15
National Council of Sports for Educational Institutions
India

C157-8
Professional Golfers Association of Germany e.V.
Germany

D156-19
Sheffield Hallam University
United Kingdom

D156-20
University of Reading - Institute of Education
United Kingdom

FEATURE

Research Methodology for Sport Science

Introduction

Herbert Haag

The introduction is presented in ten points which are organised in a logical sequence in order to make clear why ICSSPE has decided to devote one Bulletin to the topic of "Research Methodology for Sport Science". This topic is of utmost importance in order to secure a high quality development in regard to the scientific standard of sport science as related to studying and researching.

1. Science in general and sport science specifically is characterised by a constant process of differentiation and specialisation (Haag, 2014, pp. 27-28). If this development is not accompanied by holistic thinking and perceiving, the scientific development will be very one-sided. In order to secure a balance between differentiation and specialisation, as well as holistic approaches, ICSSPE as the international umbrella organisation for sport needs to offer this challenge.
2. Therefore, it is important to give attention to the aspects mentioned above in regard to research methodology for sport science. Since sport science is a so-called cross-disciplinary science (like for example health science, environment science, work science, recreation science etc.), the research approach has to be holistic in order to serve the following four clusters of sport science: natural science-medicine, social-behavioural science, political-economical scientific aspects, and philosophical, historical, cultural dimensions.
3. In regard to research methodology it has to be clearly indicated that this aspect is of importance to every scientific field (academic discipline and its sub-disciplines). It is necessary that from time to time the status of research methodology has to be surveyed by every academic discipline (and its sub-disciplines) if the development of the respective research methodologies are moving in a good direction. For this it is especially important to recognise the recent and new aspects of the academic area dealing with research methodology in general. Every scientific field - also sport science - has to recognise this.
4. If one tries to consider the place of issues related to research methodology in study curricula, it is quite obvious that research methodology in its holistic character has to have an important place. Due to the information over-flow, the content of an academic discipline only can be covered today in exemplary ways. It is however important that aspects of a structural and holistic nature are central points in the study curricula. Besides research-methodology other aspects of this kind are: Philosophy of Sport Science; Ethics of Sport Science; Information Networks in sport science; Body of Knowledge of Sport

Science; Sport Science Transfer; Researching in Sport Science; Inter-disciplinarity related to Sport Science; Globalisation/ Internationalisation in sport science (Mess & Haag, 2011).

5. Research Methodology is essential for study and research. Since a qualified study requires a critical and solid analysis of research literature, it is in a first place necessary to have knowledge about research methodology in order to understand the scientific literature. When it is required of a student to write the first research paper up to a Bachelors, Masters or PhD thesis, then it becomes even more apparent that competence in research methodology is an essential condition.

6. If one looks at study curricula of sport science more closely very often no systematically structured core units are offered in research methodology. In this case it is often assumed that research methodology is covered in the various courses. This, however, often does not happen and represents a completely accidental approach.

   It is far better if, for example, four courses are designed in a logic sequence with a qualified grade in the previous course before the next one can be taken. An example for a course sequence in scientific theory in general and research methodology in specific is:

   Introduction to sport science (basic issues).

   Foundation for the understanding of sport science literature and research (hermeneutics and statistics) (data for research are either categorical or numerical).

   Main concepts of research methodology.

   Conceptualisation of a sport science thesis.

   Each course is supposed to count two credits (2 semester hours). After the successful finishing of the four courses the student will be able to write a thesis.

7. Today more and more inter-disciplinary study and research is required especially in order to deal with complex issues. This is anyway the central approach for study and research in sport science which is called a cross-, multi-, trans- or inter-disciplinary academic field. Therefore, holistic thinking and concepts are essential for sport science. This again also relates to the field of research methodology in order to serve the four clusters of sport science sub-disciplines as described under (2).

8. These four clusters can be further explained by considering an often used system in order to logically describe the content of sport science in two sections (Haag & Mess, 2010):

   Theory Fields (listed according to the German alphabet):

   Sport Medicine/ Sport Biomechanics/ Motor Science/ Coaching Science/ Sport Informatics/ Sport Psychology/ Sport Pedagogy/ Sport Sociology/ Sport Politics/ Sport Law/ Sport Economy/ Sport History/ Sport Philosophy

   Theme Fields:

   Sport for Seniors/ Sport for the Disabled/ Doping in Sport/ Learning in Sport/ Sport and Recreation/ Guidance in Sport/ Sport and Health/ Children and Youth Sport/ High Performance Sport/ Music and Movement/ Olympism/ Psychomotor/ School Sport/ Play (and Sport)/ Sport and Europe/ Sport and Gender/ Aggression and Violence in Sport/ Sport and Environment/ Sport and Instruction/ Sport and

Mass Media/ Sport Management/ Sport Facilities- Sport Equipment/ Sport and Spectator/ Evaluation and Deciding in Sport.

Especially if one is occupied with a theme field it is quite obvious that aspects of the 13 theory fields have to be integrated in regard to a theme field. This differentiated presentation of the content of sport science once more justifies holistic and inter-disciplinary thinking also in regard to research methodology.

9. In order to promote this line of academic development the October 2015 Bulletin of ICSSPE is planned as an "Information Broker" (not a collection of research articles) with informative material for the theme of "research methodology of sport science". In the age of information overflow it is important to provide information as offered in the ICSSPE bulletin in order to have a reliable resource for direct and competent retrieval in regard to a certain topic, in this case research methodology.
10. Therefore, this Bulletin is addressing especially the staff of sport science institutes around the world. This is an avenue to make the sport science students as early in their study as possible familiar with the Information Broker approach. It is not anymore possible today to store too much of the available knowledge; but it is necessary to know avenues how to get the needed and relevant information.

In this context it has to be made very clear that the articles provided for the Bulletin do not carry factors given to research papers (compare Hirsch-Factor). But to engage in providing Information Broker services for sport sciences and its various aspects are also an important task which should be fulfilled by person engaged in teaching and research in regard to sport science.

I would like to thank Richard Bailey, Martin Holzweg and Ed Cope for their valuable contributions, which give this special feature an inside into different aspects in this field and a multidisciplinary view.

References

Haag, H. (Ed). (2010). *Research methodology for sport and exercise science* (2nd ed.). Berlin: Logos.

Haag, H. & Mess, F. (2010). *Einführung in das Studium der Sportwissenschaft* [Introduction for the study of sport science]. Schorndorf: Hofmann.

Haag, H. (2014). *Zum richtigen Umgang mit Wachstum. Mehr Qualität- weniger Quantität* [Towards a correct dealing with growth. More quality - less quantity]. Berlin: Logos.

Mess, F. & Haag, H. (2011). *Informationswege zu Sport, Sporterziehung und Sportwissenschaft* [Information avenues to sport, sport education and sport science] (2nd ed). Schorndorf: Hofmann.

Contact

Prof. em. Dr Dr h.c. Herbert Haag, M.S.
Christian-Albrechts-University of Kiel
sportpaed@email.uni-kiel.de

The Philosophy of Science and Sport and Exercise Science

Richard Bailey

Introduction

"Cheshire Puss,' she began, rather timidly, as she did not at all know whether it would like the name: however, it only grinned a little wider. 'Come, it's pleased so far,' thought Alice, and she went on. 'Would you tell me, please, which way I ought to go from here?'

"That depends a good deal on where you want to get to,' said the Cat.

"I don't much care where– ' said Alice.

"Then it doesn't matter which way you go,' said the Cat.

"– so long as I get SOMEWHERE,' Alice added as an explanation.

"Oh, you're sure to do that,' said the Cat, 'if you only walk long enough."

(Lewis Carroll, Alice's Adventures in Wonderland & Through the Looking-Glass, 1902)

The Philosophy of Science is simply philosophy directed towards questions of science. These questions generally take two forms. First, there are those related to the nature of science in general, and about central concepts in science, such as the nature of theories, truth, objectivity, and so on. The most fundamental question of this sort is whether or not there really is a special scientific method, and if so, what is it? Second, other questions focus on specific sciences. The philosophy of biology, for example, examines evolution, genetics and development, whilst the philosophy of physics is concerned with possible interpretations of relativity, quantum mechanics and string theory. The Sport and Exercise Sciences could be described as second-order fields, since they rely and built on the concepts of more fundamental disciplines like physiology, mathematics and psychology, and seek to apply them in sporting contexts. It is difficult to imagine what a distinct and coherent "philosophy of the sports and exercise sciences" might look like, but philosophical issues are inseparable from serious study and practice in the sport and exercise sciences.

This essay aims to offer an introduction to the Philosophy of Science, and discusses some of the ways in which an understanding of its debates and disputes might be relevant for researchers and practitioners in the sport and exercise sciences. The language of this field is a matter of some debate itself. In some countries, it is conventional to talk of either sport science or sport and exercise science, while elsewhere people use Kinesiology, Bio-kinetics, Human Movement Studies, and other names. Different titles sometimes reflect local traditions, and sometimes they indicate am attempt to delineate the content of the field of study. Discussion of the most suitable terminology for these areas of study is a fascinating and worthwhile philosophical activity in its own right, but I will not be doing this here.

Does it matter if the sport and exercise sciences are scientific?

"When I use a word, it means just what I choose it to mean– neither more nor less." (Humpty Dumpty, in Lewis Carroll, Alice's Adventures in Wonderland & Through the Looking-Glass, 1902)

A great deal of the literature that makes up the Philosophy of Science addresses the meanings of central terms and concepts. The most fundamental of these is of course science, and this will be the focus of this short article. But it is possible to argue, as did Humpty Dumpty that we can choose our own meanings of the words we use, and we are sometimes free to do so. Poets regularly play with words and their meanings, as do small children, and this seems perfectly acceptable. When John Lennon of The Beatles wrote, 'I am the Walrus', it would be a peculiarly literal critic who condemned him as a liar: 'I have seen pictures of Mr Lennon, and can confirm that is not, in fact, a walrus!'

Matters change when we make claims whilst trying to communicate with or claim to express truth to other people. In contexts like these, words and their meanings can matter a great deal. They can hide as well as show truth. This is not just an academic point. Adoption of the language of science is frequently used to present a set of ideas as possessing scientific value and credibility, and to adopt the intellectual authority that implies. Presumably this explains the emergence of Library Science, Leisure Science, Management Science, and so on. It might also explain why even the world of alternative medicine goes to great lengths to claim its scientific credentials.

The Australian comedian and poet Tim Minchin, in his 'beat poem' Storm, was unpersuaded by strategies (https://youtu.be/HhGuXCuDb1U):

"By definition", I begin
"Alternative Medicine", I continue
"Has either not been proved to work,
Or been proved not to work.
Do you know what they call "alternative medicine"
That's been proved to work?
Medicine."

The demarcation problems

"If you set to work to believe everything, you will tire out the believing-muscles of your mind, and then you'll be so weak you won't be able to believe the simplest true things." (Lewis Carroll, Letter to to Mary MacDonald, 1864)

The quickest way to get a sense of some of the most basic questions examined by philosophers of science is to consider the difference between science and non-science. This is called the problem of demarcation (or the problem of setting the boundaries or limits of science).

The question of what is or is not scientific knowledge is as old as science itself, and remains the subject of on-going debate among philosophers and scientists. One difficulty confronting anyone reflecting on issues is that there are many different types of science (such as theoretical and applied), concerned with many different sorts of objects (including people, animals, plants and minerals), at different stages of disciplinary maturity (from emerging areas of research to well-established sciences). Consider, for example, some of the types of research reported in recent Sport and Exercise Sciences journals:

- Randomised Control Trials of the effectiveness of physical activity interventions;
- Surveillance reports of sports participation around the world;
- Analysis of specific groups' motivations to engage in exercise;
- Systematic Literature Reviews and Meta-analyses of various, narrowly defined topics;
- Observational studies of sports coaches' behaviours;
- Laboratory studies of oxygen uptake on a treadmill;
- Brain scans of skilled practice.

Research methods used in any multi-disciplinary field are likely to be diverse, since the methods of each of the parent disciplines can potentially be used, and this variety will only be multiplied when that field encompasses both theoretical and applied work, and populations ranging from shortly after birth to death. In fact, the range of methods used by sport and exercise scientists is even wider than that, since many methods regularly used have been imported from further afield. Systematic reviewing has origins in agricultural studies of seeds and fertilisers. Cluster analysis was first used by bacteriologists. And the detailed observational procedures used to track player behaviour during a game or session were imported from ethologists' studies of animals in the wild (although that sometimes requires less of a leap of the imagination!).

Although science has been defined in many ways, most people who have examined the subject agree it is ultimately not a body of knowledge, but a way of establishing and developing a body of knowledge (Shneider, 2009). There are many forms of inquiry that are not scientific, but are perfectly respectable. History, ethics and theology would not normally be considered branches of science, but they clearly have values and standards. Ways of differentiating science from these academic disciplines is sometimes a topic of the Philosophy of Science, but far more common is the distinction between science and what is usually called pseudoscience. Pseudoscientific theories claim to conform to the methodological norms of science, but, when judged by non-believers, the claims are deemed to violate science and often common sense (Koertge, 2013). In recent article offered an alternative terminology theories and practices that look superficially like science, Are presented as silence, but do not follow the accepted standards of science: these theories are " sciency" (Collins and Bailey, 2013).

The philosopher most associated with the problem of demarcation is Karl Popper. Growing up in post-World-War-1 Vienna, he was immersed in one of the most exciting intellectual environments there has ever been. As a young man, Popper attended public lectures and read books by many of the greatest thinkers of the day. He was impressed by the boldness of Albert Einstein's new theory of relativity, and much less impressed by the psychoanalytical ideas of Sigmund Freud and Alfred Adler. The problem with Freud's and Adler's views, he thought, was that their power to explain psychological states and experiences was illusory, since it would be almost impossible to show them to be incorrect. Einstein, in contrast, explicitly stated the conditions that would kill his theory. Popper searched for some way of distinguishing between what he saw as the power of Einstein's physics and the poverty of Freud and Adler, and concluded that the answer was falsification. A theory is scientific, he reasoned, if it can be shown to be false. This is in contrast to the idea

that science operates through the generation of confirmations of theories, which had previously dominated discussions of the scientific method (and sometimes, in various forms, to this day).

According to Popper, the relative power of positive (confirmations) and negative (falsifications) evidence is asymmetrical: no amount of confirmations can demonstrate a theory's value because it is always easy to find them; but a single falsification, he claimed, can kill a theory dead. The scientist (or at least the good scientist) does not search for evidence that seems to support a theory, but looks for ways in which it might be found to be mistaken. In other words, genuinely scientific theories include statements that could be shown to be false by empirical evidence; pseudoscientific theories do not (Popper, 1934; Magee, 1973). And the spirit of falsification continues extends to the scientific community as a whole, where the "friendly-hostile co-operation" of scientists (Popper, 1994), is expressed through mechanisms like peer review of articles,

Consider, as an example of the asymmetry between confirmation and falsification, the famous 'four-minute mile' that became an iconic goal for runners in the middle of the 20th century. For years, so many athletes had tried and failed to run a mile in less than four minutes that people suggested it was a physical and psychological impossibility. Scientists of the day even believed it was unachievable, as the human body was simply not able to maintain the necessary speed of 15 miles per hour (24.14 km/h, or 2:29.13 per kilometre, or 14.91 seconds per 100 metres). The theory gathered hundreds of confirmations until a 25-year-old medical student called Roger Bannister won a mile race in Oxford, UK, with a time of 3 minutes and 59.4 seconds.

In Popper's terms, no amount of confirming evidence proved or even supported the theory that the four-minute mile was impossible. But just one negative piece of evidence destroyed that theory.

Falsification as the criterion of demarcation continues to be influential among scientists, but philosophers have generally abandoned it as a simple way of setting science apart from pseudoscience. There have been various criticisms of Popper's view, but the most damaging is probably what is sometimes called the 'Quine-Duhem Problem'. It is based on the observation that when a scientist tests a theory, it is not in isolation from other assumptions and hypotheses. So what appear to be observations that falsify a theory might really be some other factors.

Imagine a hypothetical experiment. A sport psychologist has a theory that sports players use reasoning skills during their game play which resemble norms of correct reasoning. The method is to recreate game situations, and asking players to solve problems whose correct solution is determined by logic, probability or decision-making theory. Suppose none of the participants manage to solve the problems according the prescribed. According to a simple account of Popper's view, there is cause for concluding the theory has been falsified, and it should be abandoned. But this would be premature, as all that can be concluded is that the cluster of theory, accompanying assumptions and practical aspects of the experiment failed. Where the failure lies is, in itself, impossible to identify. It might be that the norms of reasoning cannot be provided by logic, probability or decision-making theory, or that, even if they can, they have been incorrectly applied in this experiment. Alternatively, the failure might be due to performance errors, or to misapplication of the experiment. Or perhaps there are other factors about which the sport psychologist is not currently aware.

In response to these sorts of criticisms, Popper modified his theory, arguing that scientists should be very clear and explicit about both the theory and any associated assumptions and hypotheses that might affect it. In some ways, this is a stronger position, since it means that the scientist is prepared to dictate more

fully the theoretical and experimental conditions necessary for proper testing. However, it does not adequately deal with the Quine-Duhem Problem, since it will never be possible to completely deal with complicating variables. In addition, Popper's revised version of his theory lacked the beautiful simplicity of distinguishing between science and non-science that was so appealing about the original (Lakatos, 1978).

While philosophers have tended to reject Popper's formal theory of falsifications, most would endorse its central tenets, such as the central importance of a critical approach, well-designed tests and a suspicion of an over-reliance on confirming evidence. However, some philosophers have offered radically different theories of sciences. The best-known alternative is probably that of Thomas Kuhn.

In contradiction to the Popperian account of science as revolutionary, and characterised by ambitious attempts to create and destroy theories, Kuhn portrayed science as an essentially conservative practice, ruled by powerful paradigms and in which the context of research is vitally important. Popper recognised that many scientists do spend their days solving Kuhnian puzzles that work within the confines of the concepts and methods learned from textbooks. However, this apparent fact neither offers support for Kuhn's position nor does it undermine the value of experimental testing, as ultimately, Popper and Kuhn were addressing quite different questions. Kuhn portrayed science as it is sometimes carried out, whereas Popper's primary interest was in how science ought to be. Kuhn sought to describe how science worked; Popper prescribed how it should work.

At the centre of Kuhn's analysis of science was his conception of the paradigm, by which he meant a recognised scientific achievement that provides model problems and solutions to scientists. Paradigms guide ordinary scientific practice, which Kuhn labelled 'normal science', which is research based upon previous scientific achievements that have been adopted by a scientific community. It is the everyday practice of scientists, as they exercise their skills against a restricted range of puzzles. Scientists within the same paradigm are engaged in an enterprise which is structured in the same way by the paradigm. Thus, their theories, methods, practices and the puzzles they attempt to solve are very similar. Basic rules and standards are unquestioned, with dogma an essential element in the process.

As normal science proceeds and puzzle-solving activities are carried out, anomalies inevitably begin to develop, when the paradigm does not work as it is supposed to, or when circumstances arise that are not soluble within the current paradigm. Over time, these discrepancies mount up until some scientists begin to doubt the paradigm itself, and a crisis develops. Eventually, competing paradigms emerge, and a scientific revolution occurs when a new paradigm replaces the old. Kuhn called the period of crisis 'revolutionary science', when new paradigms are proposed and compete for the allegiance of the scientific community. The new paradigm is 'incommensurable' with the one it replaced, meaning that there are no neutral standards for judging or comparing different theories. The process of abandoning the old in favour of the new cannot be a gradual, logical or scientific process based upon evidence or reasoning. The differences between advocates of competing paradigms at the time of crisis will be so great that they are unlikely to agree on what would constitute good grounds for preferring one to the other, since the criteria for those preferences are internal to the different paradigms. Thus, according to Kuhn's early work, at least, the scientist does not reason herself into the new paradigm; Kuhn compared it to a conversion experience into religious groups. In this respect, Kuhn's account of science is radically different from those, like Popper, who viewed science as fundamentally concerned with bold problem-solving, innovation and exploration.

The education of the scientist, according to this image of science, is one that aims to produce competent puzzle-solvers, fully familiar with standards and methods. In large part, this training is achieved through

students attempting repetitively to solve puzzles that are learned from standard textbooks. Science is distinguished from other disciplines by its dependence upon textbooks, and until the last stages in the education of a scientist, textbooks are systematically substituted for the creative scientific literature that made them possible. The education of the normal scientist, according to Kuhn is an initiation into a largely unquestioned tradition. Kuhn implied that science is science because scientists say it is.

Kuhn presents a rather unattractive image of science education; one more akin to certain forms of religious indoctrination (Bailey, 2006). Science has traditionally been seen as the apex of rationality and critical thinking. Predictably, Kuhn's portrait of normal science education has received a frosty reception from a number of philosophers and scientists. Popper's comment is typical: "'Normal' science, in Kuhn's sense, exists. It is the activity of the … not-too-critical professional … The 'normal' scientist, in my view, has been taught badly (Popper, 1970, pp. 52-3). Others have described Kuhn's account of young scientists' training in unquestioned paradigms, dependent on uncritically absorbing the content and methods of textbooks to be more characteristic of indoctrination than Scientific education (Bailey, 2000).

Another difficulty for Kuhn's argument is that it is too inclusive, describing areas of academic work that are not usually associated with science. Consider, for example, the following sport-related contexts:

- Strength and conditioning;
- Mental skills training;
- Research into the history of the sport of chess-boxing;
- The 4-4-2 formation in football/soccer;
- Cricket match-fixing.

Each of these could be understood in terms of individuals working within variations of a general agreed set of basic concepts, theories and methods. A theory of science that might include physics, criminal behaviour and Bayern Munich's team organisation is hardly adequate!

The debate between Popper and Kuhn is, of course, only a fraction of the on-going the the debates within the Philosophy of Science. However, the central issues they discussed continue to occupy scholars, and are indicative of some of the central problems confronting anyone wishing to talk coherently about the nature of science.

Bad science

Alice laughed. "There's no use trying," she said: "one can't believe impossible things." "I daresay you haven't had much practice," said the Queen. "When I was your age, I always did it for half-an-hour a day. Why, sometimes I've believed as many as six impossible things before breakfast." (Lewis Carroll, Alice's Adventures in Wonderland & Through the Looking-Glass, 1902)

So, should we abandon the goal of demarcating between science and non-science? Since it is so difficult to draw a clean line demarcation, some think so. Paul Feyerabend, a student and then critic of Popper, claimed that there was nothing particularly distinctive or even special about the scientific method. He also argued

that there has never been a rule within science that has not been broken at some point. Specifically, he put forward the view that science is just a tradition or form of inquiry among many others and it is not characterised by any distinctive methodological rules. So, Feyerabend concluded, "the only principle that does not inhibit progress is: anything goes" (1993, p. 14).

This attitude seems hardly satisfactory to scientists confronted with questionable ideas that do not just undermine their professional work. Untested, unregulated and un-supported medical practices can be seriously harmful to people; they can even be fatal (Singh & Ernst, 2008), and such practices continue to be used regularly with athletes today (Gerbing, & Thiel, 2015). There are other dangers, too, as outlined by the philosopher and biologist Massimo Pigliucci:

"The first is philosophical: Demarcation is crucial to our pursuit of knowledge; its issues go to the core of debates on epistemology and of the nature of truth and discovery. The second reason is civic: our society spends billions of tax dollars on scientific research, so it is important that we also have a good grasp of what constitutes money well spent in this regard … Third, as an ethical matter, pseudoscience is not – contrary to popular belief – merely a harmless pastime of the gullible; it often threatens people's welfare, sometimes fatally so." (2013, unpaged)

The list of questionable ideas that have entered the Sport and Exercise Sciences is endless. In many cases, the popularity of their adoption stems from athletes' never-ending pursuit of a competitive edge; that marginal gain in performance that lets them to excel in their sport. Sometimes, they take up such ideas because their coach, or even sports governing body, promote them. These are often ergogenic aids in the areas of drugs or nutrition, training routines or competition strategies and equipment or products (Pelham, Holt, & Stalker, 2001). One of the perennial concerns with any new practice or aid is the placebo effect and its relationship to expectancy. Expectancy directly relates to the athletes' beliefs regarding the effectiveness of new idea, and a considerable amount of empirical research has demonstrated that expectancy effects alone can generate increases in performance (Lindheimer, O'Connor, & Dishman, 2015).

A recent example of an ergonomic product, that promised extraordinary gains for those who used it, is the hologram or energy bracelet. This is a rubber wristband carrying a hologram (a photographic recording of a light field). According to one manufacturer, the wristband incorporates 'hologram frequency-embedded technology'. It is not entirely clear what 'hologram frequency means, other than it "mimics Eastern philosophies" (https://en.wikipedia.org/wiki/Hologram_bracelet#cite_note-PBFAQ-7). The makers the best-known hologram wristband claimed the "performance technology is a mylar hologram embedded with a range of frequencies that react positively with your body's energy field", resulting in "faster synaptic response, enhanced muscle response, increased stamina, more flexibility and vastly improved gravitational balance" (cited in Brice, Jarosz, Ames, et al, 2011). For a while, these products became hugely popular partly due, no doubt, by the fact that celebrity sports stars like Cristiano Ronaldo, David Beckham, Rubens Barrichello and Shaquille O'Neal wore and endorsed them. Unfortunately, the creators of these products seem to have undertaken no tests on the effectiveness before marketing them, and all rigorous tests so far have found the wristbands to have no effect on performance (Hansson, Beckman, & Persson, 2015; Teruya, Matareli, Soares, et al, 2013).

A second example of a questionable practice is learning styles. The relevance here is that assessments of learning styles is extremely common in certain areas of sport and exercise science, especially sports coaching. A survey of questionable practices in coaching in the UK revealed that every major national governing body for sport used some form of learning styles assessment at some point in their coach

education, and anecdotal evidence suggests a similar pattern exists in other countries. Learning styles refers to the belief that different people learn information in different ways (Pashler, McDaniel, Rohrer, & Bjork, 2008). The assumption of the learning styles hypothesis is that different people learn information in different ways, and that formal experiences can be tailored to the individual learning style of the student, player or coach. It this idea is true, it would revolutionise coaching, as it would allow coaches to identify each player's learning strengths, and to develop a bespoke programme of development, much as they might devise a physical fitness training schedule. As before, and despite its great popularity, there is no compelling evidence that matching formal instruction to individual perceptual strengths and weaknesses is any more effective than instruction which is not multi-sensory specific (Kirschner & van Merriënboer, 2013; Rohrer, & Pashler, 2012). Teaching according to an assumed preference may even cause harm, as learning is best promoted by taking students out of their comfort zones, not keeping them in it (Coffield, Moseley, Hall, et al, 2004).

So, at the issues discussed by philosophers of science are not just of academic interest. They often have very practical implications. For example, distinguishing between pseudoscience and genuine science has a practical importance. But in the absence of neat criteria of demarcation (such as falsification), is it really possible to identified science?

A useful tool used by philosophers when clarifying ideas is to consider the 'necessary' and/or 'sufficient' conditions for its use (Brennan, 2012). A sufficient condition occurs when it is enough to make something happen, whereas a necessary condition means that something will not happen unless the condition happens. For example, for a sports team to win a competition it is necessary to practice (but that is not enough on its own). Breaking a major rule during a game is sufficient for them to be disqualified. Popper believed that falsification was both a necessary and sufficient condition for an activity to count as science. There are reasons to suppose that this characterisation of science has serious problems. Kuhn's account is less clear, but it would be fair to say that there are certain characteristics that are necessary for fields of inquiry to possess for them to be scientific, such as established paradigms, with shared concepts and methods. So, although Kuhn did not identify sufficient criteria for science, he did believe there are necessary ones. Some philosophers, however, have abandoned the pursuit of necessary and sufficient conditions for something to be science completely. In its place, they have tended to provide lists of criteria that make a field more or less scientific. According to this view, a field that shows a number of specified characteristics is considered more likely to be scientific or pseudoscientific. Tavris (2003), for example, wrote that, in contrast with pseudoscience, scientific research tends to be characterised by a willingness to question received wisdom, to gather empirical evidence to determine the validity of the prediction, and falsification. Another list tried to highlight the characteristics of pseudoscience (Lilienfeld, Lynn, & Lohr, 2015):

- unfalsifiability
- absence of self-correction
- overuse of ad hoc immunizing tactics designed to protect theories from refutation' of;
- absence of connectivity with other domains of knowledge (i.e., failure to build on extant scientific constructs;
- the placing of the burden of proof on critics rather than on the proponents of claims;

- the use of obscurantist language (i.e., language that seems to have as its primary function to confuse rather than clarify;
- overreliance on anecdotes and testimonials at the expense of systematic evidence;
- evasion of peer review;
- emphasis on confirmation rather than refutation;
- absence of boundary conditions (well-articulated limits under which predicted phenomena do and do not apply); and
- the mantra of holism (the idea that scientific claims cannot be judged in isolation).

Considered individually, many of these criteria are insufficient to indicate that field is pseudoscientific or has problems. Conclusive falsification, as has been seen, is extremely difficult (if not impossible), and obscure language is hardly absent from scientific journals. In fact, many of these characteristics could be identified in reputable scientists. The point, however, it is not to compile a list of necessary criteria for science, but merely a list of clues that will help to separate good scientific work from nonsense.

This is a much more modest aim than Popper and Kuhn sought. But perhaps it is also more realistic? Science is complex and takes many forms, and this especially true for sport and exercise science, so it seems unlikely to be reducible to simple criteria of demarcation. There is much scepticism among philosophers about the possibility of clearly distinguishing science from non-science, in part by unsuccessful attempts to provide such criteria in the past, and by the acknowledgement of the ever-increasing diversity of methodologies and methods of those disciplines considered scientific. Early, ambitious attempts by the likes of Popper to provide a satisfactory criterion of demarcation have been replaced by more contested approaches. However, there are good reasons to continue this enterprise. And there are good reasons why is sport and exercise scientists should become familiar with these debates.

Conclusion

“Begin at the beginning," the King said, very gravely, "and go on till you come to the end: then stop.” (Lewis Carroll, Alice's Adventures in Wonderland & Through the Looking-Glass, 1902)

So, sport and exercise scientists need an account of what science is, what scientists do, and what aims and methods characterise scientific research. Consumers of sport, exercise and health are bombarded with remarkable claims. With such responsibility handed to scientists and the scientific community, it is important that there is some strong understanding of what counts as a proper science and, as opposed to pseudoscience and non-science. Otherwise, it would be impossible to distinguish between contemporary exercise physiology and ancient theories of energy, or between sport psychology and psychobabble. The sciences of sport and exercise can bring many benefits, both for individuals and societies, from improved sports performance to the reduction of noncommunicable diseases. If there is a value in Sport and Exercise Sciences within the perennial context of limited resources, it seems important to be able to identify what counts as science and which research projects are worth supporting and learning from.

Acknowledgements

Thanks to Danny Parnell, Ed Cope, Jen Leigh and Matt Reeves for helpful comments on this article.

References

Bailey, R. P. (2006). Science, Normal Science and Science Education – Thomas Kuhn and Education. *Learning for Democracy, 2*(2), 7–20.

Bailey, R. P. (2013). *The use of questionable methods in sports coaching organisations in the UK.* Unpublished manuscript.

Bortolotti, L. (2008). *An introduction to the Philosophy of Science.* Malden, MA: Polity.

Brennan, A. (2012). Necessary and Sufficient Conditions. In E. N. Zalta (Ed.), The Stanford Encyclopedia of Philosophy. Retrievd from: http://plato.stanford.edu/archives/win2012/entries/necessary-sufficient/

Brice, S. R., Jarosz, B. S., Ames, R. A., Baglin, J., & Da Costa, C. (2011). The effect of close proximity holographic wristbands on human balance and limits of stability: A randomised, placebo-controlled trial. *Journal of Bodywork and Movement therapies, 15*(3), 298–303.

Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). *Learning styles and pedagogy in post-16 learning. A systematic and critical review.* London: Learning and Skills Research Centre.

Collins, D. & Bailey, R. P. (2013). 'Scienciness' and the allure of second-hand strategy in talent identification and development'. *International Journal of Sport Policy, 5*(2), 183–191.

Feyerabend, P. (1993). *Against Method* (3rd ed.). London: Verso.

Gerbing, K. K., & Thiel, A. (2015). Handling of medical knowledge in sport: Athletes' medical opinions, information seeking behaviours and knowledge sources. *European journal of sport science, (ahead-of-print),* 1–8.

Hansson, E. E., Beckman, A., & Persson, L. (2015). Does a mineral wristband affect balance? A randomized, controlled, double-blind study. *Journal of Otolaryngology-Head & Neck Surgery, 44*(1), 1–5.

Kirschner, P. A., & van Merriënboer, J. J. (2013). Do learners really know best? Urban legends in education. *Educational Psychologist, 48*(3), 169–183.

Koertge, N. (2013). Belief Buddies versus Critical Communities: The Social Organization of Pseudoscience. In M. Pigliucci & Boudry (Eds.), *Philosophy of Pseudoscience: reconsidering the demarcation problem*. Chicago, IL: University of Chicago Press.

Kuhn, T. S. (1962). *The Structure of Scientific Revolutions* (2nd ed.). Chicago, IL, University of Chicago Press.

Lakatos, I. (1978). *The Methodology of Scientific Research Programmes: Philosophical papers, Volume 1.* Cambridge: Cambridge University Press.

Lilienfeld, S. O., Lynn, S. J. E., & Lohr, J. M. (2015). *Science and pseudoscience in clinical psychology* (2nd ed.). New York: Guilford Press.

Lindheimer, J. B., O'Connor, P. J., & Dishman, R. K. (2015). Quantifying the Placebo Effect in Psychological Outcomes of Exercise Training: A Meta-Analysis of Randomized Trials. *Sports Medicine, 45*(5), 693–711.

Magee, B. (1973). *Popper.* London: Fontana.

Pelham, T. W., Holt, L. E., & Stalker, R. (2001). Acupuncture in human performance. *The Journal of Strength & Conditioning Research, 15*(2), 266–271.

Pigliucci, M., & Boudry, M. (2013). The dangers of pseudoscience. New York Times, 1010/13 (accessed 10/10/15).

Popper, K. R. (1934). *Logik der Forschung: zur Erkenntnistheorie der moderner Naturwissenschaft.* Berlin: Verlag von Julius Springer.

Popper, K.R. (1970). Normal Science and Its Dangers. In I. Lakatos and A. Musgrave (Eds.), *Criticism and the Growth of Knowledge*. Cambridge: Cambridge University Press.

Rohrer, D., & Pashler, H. (2012). Learning styles: where's the evidence? *Medical Education, 46*(7), 634–635.

Shneider, A. M. (2009). Four stages of a scientific discipline; four types of scientist. *Trends in Biochemical Sciences 34*(5), 217–223.

Singh, S., & Ernst, E. (2008). *Trick or treatment: The undeniable facts about alternative medicine.* New York: WW Norton & Company.

Tavris, C. (2003). Mind games: Psychological warfare between therapists and scientists. *Chronicle of Higher Education, February 28*, B7–B9.

Teruya, T. T., Matareli, B. M., Soares, R. F., & Mochizuki, L. (2013). The effect of a silicone wristband in dynamic balance. *Perceptual and motor skills, 117*(2), 353–357.

Contact

Dr Richard Bailey
International Council of Sport Science and Physical Education (ICSSPE)
rbailey@icsspe.org

Research Methods References and Respective Standard Software Packages for Quantitative and Qualitative Data Analyses in the Field of Physical Activity, Physical Education, and Sport Sciences

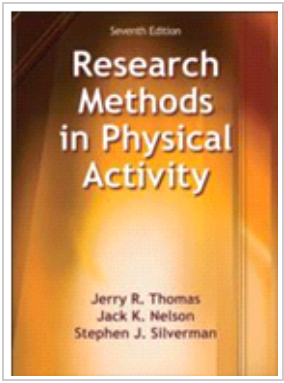
Martin Holzweg

Introduction

This article consists of two parts: in the first part a selection of standard research methods references in the field of physical activity, physical education, and sport sciences is presented; in the second part five selected software packages (IBM SPSS®, and R, ATLAS.ti®, MAXQDA®, and NVivo®), that are commonly used for quantitative and qualitative data analyses in social sciences are introduced.

Standard research methods references in the field of physical activity, physical education, and sport sciences

In this part some standard research methods references in the field of physical activity, physical education, and sport sciences will be presented. Three books (Thomas, Silverman & Nelson, 2015; Amour & MacDonald, 2012; Tenenbaum & Driscoll, 2005), one journal (Measurement in physical education and exercise science) and a review article (Silverman, 1991) were chosen to provide a brief overview.



Thomas, J. R., Silverman, S., & Nelson, J. (2015). *Research methods in physical activity* (7th ed.). Champaign, Ill.: Human Kinetics.

The 7th edition of *Research Methods in Physical Activity* was edited by Jerry R. Thomas, Jack K. Nelson and Stephen Silverman. All three academics are distinguished professors in the field of research methodology and are/were very active in the National Academy of Kinesiology, the American Alliance for Health, or Physical Education, Recreation and Dance (AAHPERD). Thomas and Silverman both served as editor in chief

for the journal *Research Quarterly for Exercise and Sport*. Silverman additionally served as co-editor of the *Journal of Teaching in Physical Education*.

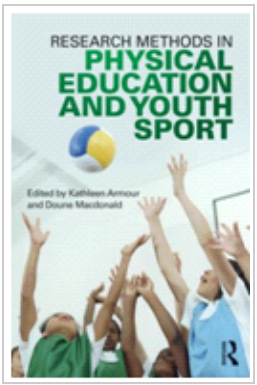
The *Research Methods in Physical Activity* publication is widely used as *the* basic research methods book in the field of sport science and physical education in English speaking countries, and especially in the North American region. Silverman and Keating (2002) showed that most students (71%) used the Thomas & Nelson *Research Methods in Physical Activity* book in their research methods classes in departments of kinesiology and physical education in the United States. The book is a systematic guide for students and researchers through the research process specifically for kinesiology and exercise science disciplines.

The 7th edition of *Research Methods in Physical Activity* consists of four parts and an appendix.

Part I (overview of the research process), includes five chapters that give an introduction to research in physical activity, developing a problem and using literature, presenting a problem/research plan, formulating methods, and understanding ethical issues in research and scholarship. Part II (statistical and measurement concepts in research) consists of six chapters that deal with statistical concepts, statistical issues in research planning and evaluation, relationships among variables, differences among groups, nonparametric techniques, and measuring issues (research variables). Part III (types of research) contains nine chapters that deal with the socio-historical process in sport studies, philosophical research in physical activity, research synthesis (meta-analysis), surveys, other descriptive research methods, physical activity epidemiology research, experimental and quasi-experimental research, qualitative research, and mixed-methods research. Part IV (writing the research report) rounds the book off with two chapters, that deal with completing the research process and ways of reporting/presenting research. The appendix includes statistical tables, references, an author index, and a subject index.

Additionally, supplementary instructional materials (an instructor guide, a test package and a presentation package plus image bank) are available via the Human Kinetics website: www.humankinetics.com/researchmethodsinphysicalactivity

The instructor guide amongst others contains chapter overviews, supplemental learning activities, and student handouts. The test package consists of more than 300 questions in multiple-choice and essay formats. The presentation package includes more than 300 Powerpoint slides, and the image bank contains artworks, tables, and examples from the book in order to allow easy incorporation into lectures and Powerpoint slides.



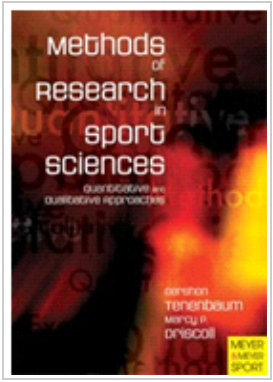
Armour, K., & MacDonald, D. (Eds.). (2012). *Research methods in physical education and youth sport.* London: Routledge.

Research Methods in Physical Education and Youth Sport was edited by Kathleen Armour and Doune Macdonald. Both are distinguished professors in the field of sport pedagogy and physical education and are active in the Association Internationale des Écoles Supérieures d'Éducation (AIESEP).

Research Methods in Physical Education and Youth Sport is the first research methods book that focuses entirely on physical education and youth sport. It includes five sections with overall 24 chapters, each written by a tandem consisting of one well-known expert and one younger academic in the respective field.

Section 1 (planning the research process) contains four chapters that relate to research question, research principles and practices, the positioning of the researcher, and quality aspects ('good' research). Section 2 (methodology: the thinking behind the methods) contains chapters that deal with research frameworks, ethical questions, qualitative approaches, quantitative approaches, mixed methods, and research in physical education and youth sport, that includes young people's voices. In contrast to the *Research Methods in Physical Activity* book (Thomas, Silverman, & Nelson, 2015) in this book the extent that elates to data collection methods (chapter 3) is much larger than the extent that relates to data analysis methods (chapter 4 with its subchapters analyzing qualitative data and analyzing quantitative data). Positively speaking the subchapters of chapter 3, namely reviewing literature, experimental research methods, measurement of physical activity, surveys, observational studies, case study research, interviews and focus groups, narrative research methods, action research, visual methods, grounded theory, discourse analysis give an excellent overview on the different data collection methods in physical education and youth sport. Section 5 (communicating your research) rounds off the book by addressing effective research writing and the dissertation.

Each chapter includes chapter summaries, practical activities, case studies, dialogues with active researchers and guidance on further reading and resources.



Tenenbaum, G., & Driscoll, M. P. (2005). *Methods of Research in Sport Sciences: Quantitative and qualitative approaches.* Oxford: Meyer & Meyer.

The handbook *Methods of Research in Sport Sciences: Quantitative and qualitative approaches* is edited by Gershon Tenenbaum and Marcy P. Driscoll, both of whom work at Florida State University. Gershon Tenenbaum is distinguished expert in sport and exercise psychology with a profound knowledge in complex quantitative research methods. Marcy P. Driscoll is distinguished expert in educational psychology.

Methods of Research in Sport Sciences: Quantitative and qualitative approaches consists of six chapters, each with several subchapters: 1) research plan and design, 2) descriptive and inferential statistics, 3) correlational methods, 4) experimental methods, 5) an introduction to qualitative research, and 6) qualitative research in sport psychology. The content of the handbook is presented in a hierarchy in terms of

complexity, which allows using it for teaching, both on a simple level as well as on a more advanced level (including complex multivariate methods). The pedagogical concept of the book allows to carry over the learning contents to other courses and apply them to other domains of interest.

A strength of the handbook is the large extent and clarity of the chapters that relate to the quantitative approach (chapters 2, 3 & 4). Chapter 5 nicely rounds off the handbook by also taking into account the qualitative approach, whereby chapter 6 specially addresses qualitative research in the field of sport psychology. Subchapter 6.4 is of special interest as it introduces the software package NUD*IST 4® (NUD*IST® – *N*on numerical *U*nstructured *D*ata *I*ndexing *S*earching and *T*heorizing software – was the original name of the software package from 1981 until 1997 which later led to NVivo®). The authors of this article liked Tenenbaum & Driscoll's idea to also include a description of a software package in their handbook, as it seems to make sense in the 21 century to also take into account recent developments in the software sector, when it comes to research methodology. For that reason the authors of this article also included short descriptions of five commonly used software packages for quantitative and qualitative data analyses in social sciences (compare part 2 of this article).

Measurement in Physical Education and Exercise Science. London: Routledge.

Measurement in Physical Education and Exercise Science is the official quarterly journal of Society of Health and Physical Educators (SHAPE America) and is edited by Prof. Dr Nicholas D. Myers, University of Miami, and published by Routledge. It consists of the seven sections exercise science, pedagogy, physical activity, psychology, research methodology/statistics, sport management and administration, and tutorial/teacher's toolbox

Measurement in Physical Education and Exercise Science is *the* scholarly journal when it comes to measurement research in the area of physical education and exercise science. Each of its section is devoted to theoretical and methodological issues in measurement and statistics. The journal presents current research, test reviews, tutorials, commentaries, and discussions of theoretical and methodological issues in measurement and statistics in the field of physical education and exercise science.

Measurement in Physical Education and Exercise Science is abstracted/indexed in several databases (e.g. EBSCOhost, ERIC, Physical Education Index, PsycINFO, ScienceDirect, and Scopus).

Silverman, S. (1991). Research on teaching in physical education. *Research Quarterly for Exercise and Sport, 62*(4), 352–364.

In 1991 Silverman published an interesting review article on research on teaching in physical education in issue 4 of the journal *Research Quarterly for Exercise and Sport.* One aspect of his review article especially dealt with research methodology that was employed in the research field *teaching in physical education*. At the end of his article Silverman (1991) presents conclusions and future directions are that have implications for researchers, teachers, and teacher educators.

Looking back to Silverman's research article from 1991, and the other contributions to *Research Quarterly for Exercise and Sport, 62*(4), it is interesting to see which implications for researchers, teachers, and teacher educators – also with regard to research methodology – Silverman foresaw almost 25 years ago. Although the authors of this article is usually basically interested in innovative future trends in research methodology he thinks it is really worth to read that Silverman's (1991) review article again from today's perspective, to also be aware of the ongoing discussions on research methodology in research on teaching in physical education over the last decades.

Research Quarterly for Exercise and Sport, 62(4) and the review article of Silverman (1991) are available as download via the Routledge website: www.tandfonline.com/toc/urqe20/current

Standard software packages for quantitative and qualitative data analyses in the field of physical activity, physical education, and sport sciences

In this chapter two software packages for quantitative data analyses (IBM® SPSS®, and R) three software packages for qualitative data analyses *(ATLAS.ti®, MAXQDA®, and NVivo®)* are introduced.

Software packages for quantitative data analyses

Besides *Statistica, SAS oder STATA*, at the moment *IBM® SPSS® Statistics* and *R* seem to be the most popular software packages for conducting quantitative data analyses.

SPSS®

IBM® SPSS® is product family, designed for statistical data analyses. The most famous product of this product family is *IBM® SPSS® Statistics*. The name SPSS originally stood for *Statistical Package for the Social Sciences*, since IBM took over SPSS Inc. in 2009. Currently *IBM® SPSS® Statistics* is available in its 23th version. Over the last decades SPSS was *the* standard software in social sciences – including sport sciences – for analyzing quantitative data. One reason for the dominance was also grafical unser interface (GUI), which was easy to handle and allowed automatic analyses (even with minor knowledge of research methods). Besides being available in Windows and MacOS versions, another advantage of SPSS was that a wide range of respective literature existed. However, the integration of other applications in SPSS was problematic and intuitive changes were difficult. For these and other reasons SPSS in the last years lost a little bit of its dominating position.

Figure 1. Screenshot of the SPSS® website (www.ibm.com/software/analytics/spss , 12 October 2015)

R

R is an open source statistic program which became increasingly popular over the last years. One of the biggest advantages of *R* is the fact, that it is free of charge (general public license). In the beginning some R users were scared by the programming language but with R Studio it became much easier for most users to work with *R*.

R is compatible with any system software and easily allows integrating other applications. Another advantage is that new statistical methods are quickly implemented in *R*. There are a lot of additional packages and help tools available, which are regularly updated by the developer and online community. In contrast to SPSS®, the settling-in period for *R* is a little bit longer and in *R* a certain knowledge of research methods is necessary.

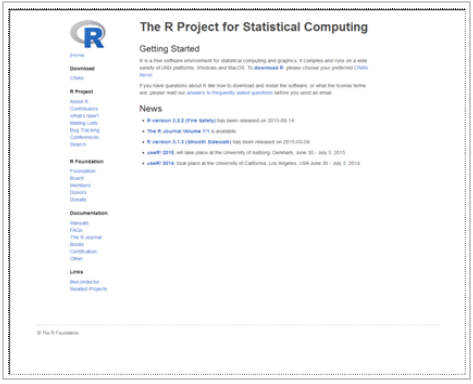


Figure 2. Screenshot of the R website (www.r-project.org,10 October 2015)

Software packages for quantitative data analyses

At the moment *ATLAS.ti®, MAXQDA®, and NVivo®* are the most popular software packages for conducting qualitative data analyses. Some years ago Holzweg (2009) compared the three software packages in the IT News section of the International Journal of Physical Education.

ATLAS.ti

ATLAS.ti is a software package that allows qualitative analyses of large bodies of textual, graphical, audio, and/or video data. It contains several tools for analysing 'unstructured data' which cannot be meaningfully analysed by formal, statistical approaches. The tools allow large amounts of data to be managed, extracted, compared, explored, and reassembled in meaningful, creative, flexible and systematic ways. ATLAS.ti has a graphical user interface (only available in English) which allows intuitive on-screen coding (e.g. drag and drop). The Central ATLAS.ti elements are hermeneutic units (so-called HUs); the level below the HU contains the primary documents with corresponding quotations (primary documents extracts) as well as codes which are related to the quotations. Memos (free annotations) can also be created. Modelling processes, such as linking codes to networks, belong to the conceptual mode (compare ATLAS.ti Scientific Software Development, 2014).

Figure 3. *Screenshot of the ATLAS.ti® website (www.atlasti.com, 10 October 2015)*

MAXQDA

MAXQDA is primarily used to evaluate the quality of text files. Texts imported or directly created in the program in RTF (Rich Text Format) can be edited and analysed with MAXQDA in a very structured way. A direct import of text extracts of the internet browser is possible via drag and drop. The files to be analysed can be clearly structured with MAXQDA (folder structure); text-specific overviews of the appropriate codings, codes and memos can be generated very easily at the click of a mouse. Text memos can be attached as visualised 'post-its', e.g. to capture context information. A weight score can be attached to text segments indicating their relevance to the research on a scale from 1-100. The assigned weight score can be visualised and, via a filter, also serves as a sorting or selecting criteria in the lists of search results (compare Verbi Software, 2015).

Figure 4. *Screenshot of the MAXQDA® website (www.maxqda.com, 10 October 2015)*

NVivo

The QRS software package NVivo is the successor of NUD*IST. Similar to ATLAS.ti, NVivo can be import, edit and analyse text documents (Rich Text, RAW Text, Word and PDF), audio (mp3, wma and wav) and video data (in mpg, wmv and avi format) as well as digital pictures (in bmp, gif, jpg and tif format). Besides data direct import (e.g. via drag and drop) new files can also be created completely in NVivo. The NVivo interface is available in different languages (including English) and can be easily switched. While editing of huge amounts of data (up to 10,000 documents simultaneously), it is principally possible to import data that has been created with ATLAS.ti and MAXQDA. After a converting process imported data can be edited with NVivo. An NVivo search function also enables to electronically count the amount of times certain prescribed words are mentioned in text documents (compare QRS International, 2015).

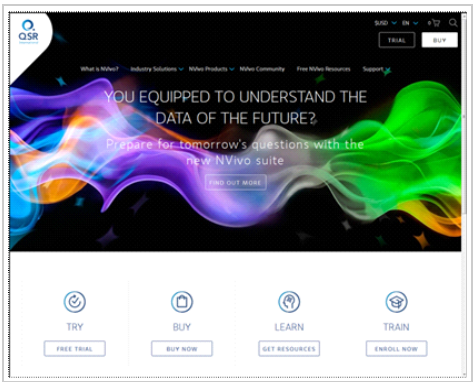


Figure 5. *Screenshot of the NVivo® website (www.qsrinternational.com, 10 October 2015)*

Refereneces

Armour, K., & MacDonald, D. (Eds.). (2012*). Research methods in physical education and youth sport.* London: Routledge.

ATLAS.ti Scientific Software Development (2014). ATLAS.ti 7 User Manual. Retrieved from: www.atlasti.com/wp-content/uploads/2014/05/atlasti_v7_manual_en_201409.pdf

Holzweg, M. (2009). IT News. *International Journal of Physical Education, 3*, 40.

VERBI Software (2015). *MAXQDA 12 Reference Manual.* Retrieved from: www.maxqda.com/download/manuals/MAX12_manual_eng.pdf

Silverman, S. (1991). Research on teaching in physical education. *Research Quarterly for Exercise and Sport, 62*(4), 352–364.

Silverman, S., & Keating, X. D. (2002). A descriptive analysis of research methods classes in departments of kinesiology and physical education in the United States. *Research Quarterly for Exercise and Sport, 73*(1), 1–9.

Tenenbaum, G., & Driscoll, M. P. (2005). *Methods of Research in Sport Sciences: Quantitative and qualitative approaches.* Oxford: Meyer & Meyer.

Thomas, J. R., Silverman, S., & Nelson, J. (2015). *Research Methods in Physical Activity* (7th ed.). Champaign, Il.: Human Kinetics.

QSR International (2015). *Nvivo 11. Getting started guide*. Retrieved from: http://download.qsrinternational.com/Document/NVivo11/11.0.0/NVivo11-Getting-Started-Guide-Plus-edition.pdf

Contact

Martin Holzweg
International Council of Sport Science and Physical Education (ICSSPE)
mholzweg@icsspe.org

Including Children in Research: The Use of a Visual Research Methodology

Ed Cope

Introduction

Involving children in the research process has been limited in the extant sport, physical education (PE), and physical activity (PA) literature. Psychometric methods in the form of surveys and questionnaires, or different types of interviews have been the method chosen to generate data where children have been the focus of the research. It has been claimed, however, that these methods fail to consider children as an active part of the research process. In other words, data have been collected from children instead of with children (Clark & Moss, 2011). The purpose of this article is twofold. First, it is to discuss the possibilities of using a visual research methodology when children are the focus of the research project. Second, it will offer some practical advice for those wanting to incorporate a visual methodology in their research and/or practice.

What is a visual research methodology?

A visual research methodology uses media, such as photographs and drawings as means to communicate people's perspectives and experiences in various areas of their lives. For example, childhood education researchers have long used this type of methodology as a means to more authentically explore how children experience the many aspects of school life. Also, ethnographers wanting to capture children's home life have employed this methodology to reveal what children constitute as being important in their cultural contexts.

In sport, PE and PA some research has been conducted using this methodology. However, of this research, most of it is with older children or adolescents (those aged 12-18). What has not been as forthcoming is the use of this methodology with younger children who are in their primary or elementary years (5-11 year olds). It is during these years that children form their sport and PA habits so understanding how they experience sport, PE and PA is important.

Why a visual research methodology?

Using a visual research methodology enables children's perspectives and experiences to be explored in a more authentic manner than traditional methods such as interviews and questionnaires allow (Coad & Lewis, 2004). Several criticisms have been directed at the use of interviews and questionnaires when subjects in the research study are children. Indeed, Prout (2005) suggests that it is important to acknowledge the methodologies used by researchers as these may limit or restrict what children are able to say about their experiences. For example, in questionnaires and structured interviews it is the researcher who decides what

to ask, with children being the receiver of these questions (Christensen & James, 2008). So, if children were presented with a questionnaire that contained a number of items, children are only able to select pre-determined items, which may not entirely represent what they meant or really wanted to say (Mauthner, 1997).

A further danger of placing children within a questionnaire or interview context is that children often seem to give an answer they believe the adult researcher wants to hear, rather than a true representation of their experiences and perspectives (Clark, 2005). In other words children could be led to believe there is a right or wrong answer, which they then attempt to second-guess. In addition, McWilliam, Dooley, McArdle and Pei-Ling Tan (2009) claim that children could determine interviews and questionnaires to be interrogative in nature, whereby the researcher attempts to extract information for their benefit. For these reasons, researchers have to be mindful of making conclusions based on these data.

Further claims made have been that in interviews and questionnaires, children's repertoire of language may be limited, thus restricting their ability to even convey what they actually mean and want to say (Mitchell 2006; Spyrou 2011). This leads to short worded answers (Tizard & Hughes 1984), as children are unable to give a depth of response that tells the researcher about how children think, feel, or experience things. This has led to Piggott (2010) questioning whether such methods can genuinely enable children to express their perspectives and experiences.

The use of a visual methodology could make up for the shortcomings in more commonly used methods such as interviews and questionnaires. The first reason for this is that on the conceptual level, children are regarded as active agents (Ryan, 2008). This approach to research is termed the mosaic approach, which is where knowledge is generated with children rather than extracted from them (Clark & Moss, 2011), and thus places children at the centre of the research process (Clark, 2011). As well as having scope for researchers, the use of a visual research methodology also has the capacity to impact on the practice of practitioners. It has been suggested that the data generated enable practitioners the opportunity to re-examine their current practices (Gravestock, 2010) and consider if children experienced sport in the ways they perceive them to. Practitioners could also use this methodology as an assessment *for* learning strategy. For example, they could ask children to take photographs or construct drawings to demonstrate their learning and development of a particular topic or theme. Asking children to complete this task gives them time to reflect on their experiences and thus make sense of their learning. Giving learners time to think is crucial if the thinking is to be at a critical level (Cope, Partington, Cushion & Harvey, in review).

Employing a visual research methodology in research and/or practice

Reflections from using this methodology reveal that it is not without its challenges and that certain processes need to be followed if it is to generate data that express children's views (Cope, Harvey & Kirk, 2015). As is the case with any qualitative methodology, trust and rapport need to be built with children. For practitioners who work with children on a regular basis this is unlikely to be an issue, however for researchers who are often not part of the children's everyday life this can be challenging. Therefore, researchers need to take time getting to know children in order to build this trust. Cope et al. (2015) found that it took multiple visits to engage children in photography and drawing before they were willing to share their experiences of the coaching they received.

There also needs to be consideration given for who has ownership over the drawing. Early work in this area required children to take the photo or do the drawing, but it was the researcher who interpreted it. (visual research book) showed this approach to be flawed as researchers often interpreted the data differently to children. In light of this, researchers and practitioners need to be mindful of ensuring children are able to talk about their visual data so it is their meaning that is reported and not that of the adult. The role of the adult in this situation is to prompt the child to talk at length about their visual image, but it should be the child who is leading the conversation.

Once these data have been generated it is important that researchers and practitioners respond to children's perspectives and experiences. Unfortunately, current research findings suggest that data generated from using a visual methodology fall short in explaining how this data could impact on practice. What researchers and practitioners need to do is not only listen to what children have to say, but also respond to this through the way learning environments in sport, PE and PA are constructed and delivered.

Conclusion

The use of a visual research methodology with children is useful for finding out about their perspective and experiences. It has been reported that this methodology enables children to provide a more meaningful account than traditional methods such as questionnaires or interviews allow. From a practitioner perspective there is considerable scope to employ this methodology in order to better inform practice. However, despite these benefits, a visual research methodology has been used sparingly across the contexts of sport, PE and PA. A potential reason for this might be due to a lack of understanding of how to employ this methodology from a research and practice perspective. Reflections from the field demonstrate that trust and rapport needs building with children before attempting to use this methodology. However, once this has been achieved the data generated with children could have significance for how their future experiences are shaped. This will only be realized though if researchers and practitioners start responding to what children are saying through the way they structure and deliver their practices.

References

Christensen, P., & James, A. (2008). *Research with children: perspectives and practices*. London: Routledge.

Clark, A. (2005). Listening to and involving young children: a review of research and practice. *Early child development and care, 175*(6), 489–505.

Clark, A. (2011). Breaking methodological boundaries? Exploring visual, participatory methods with adults and young children. *European early childhood education research journal, 19*(3), 321–330.

Clark, A., & Moss, P. (2011). *Listening to young children: the mosaic approach*. London: NCB.

Coad, J., & Lewis, A. (2004). *Engaging children and young people in research: a systematic literature review for The National Evaluation of The Children's Fund*. Retrieved from: www.ne-cf.org

Cope, E., Harvey, S., & Kirk, D. (2015). Reflections on using visual research methods in sports coaching. *Qualitative Research in Sport, Exercise and Health*, *7*(1), 88–108.

Cope, E., Partington, M., Cushion, C., & Harvey, S. (in review). An Investigation of Professional Top-Level Youth Football Coaches' Questioning Practice. Submitted to *Physical Education and Sport Pedagogy.*

Gravestock, H. M. (2010). Embodying understanding: drawing as research in sport and exercise. *Qualitative research in sport, exercise and health, 2*(2), 196–208.

Mauthner, M. (1997). Methodological aspects of collecting data from children. *Children & Society, 1*(1), 16–28.

McWilliam, E., Dooley, K., McArdle, F., & Pei-Ling Tan, J. (2009). Voicing objections. In A.Y. Jackson and L.A. Mazzei, (Eds). *Voice in qualitative inquiry: challenging conventional, interpretive, and critical conceptions in qualitative research*. London: Routledge, 63–76.

Mitchell, L. M. (2006). Child-centered? Thinking critically about children's drawings as a visual research method. *Visual anthropology review, 22*(1), 60–73.

Piggott, D. (2010). Listening to young people in leisure research: the critical application of grounded theory. *Leisure studies, 29*(4), 415–433.

Prout, A. (2005). *The future of childhood: towards the interdisciplinary study of children*. London: Routledge.

Ryan, P. (2008). How new is the "new" social study of childhood? The myth of a paradigm shift. *Journal of interdisciplinary history, 38*(4), 553–576.

Spyrou, S. (2011). The limits of children's voices: from authenticity to critical, reflexive representation. *Childhood*, *18*(2), 151–165.

Tizard, B., & Hughes, M. (1984). *Young children learning: talking and thinking at home and at school*. London: Fontana.

Contact

Dr Ed Cope
University of Hull, Hull, UK
Department of Sport, Health and Exercise Science
e.cope@shu.ac.uk

Research Methodology in the Context of a Holistic Theoretical Framework for Sport Science

Herbert Haag

This article outlines ten aspects of a holistic theoretical framework for sport science. One of these ten aspects is research methodology, and in covering the other nine aspects it becomes clearer what research methodology can contribute to a necessary holistic understanding of sport science (Mess & Haag, 2011).

The ten aspects can be described in the following way:

Philosophy of sport science

The philosophy of sport science can be divided into *epistemology* (e.g. hermeneutics, phenomenology, empiricism) and *scientific theory* (e.g. subjective idealism, dialectic materialism, critical theory, critical rationalism, logical empiricism, positivism).

Some points can be made about this general introduction:

- It is important to distinguish between theories dealing with the issue on how scientific knowledge can be generated (epistemology) and theories which try to give a theoretical background for science (e.g. human action);
- The three presented scientific theories (e.g. hermeneutics, phenomenology, empiricism) are not all-inclusive, but major examples;
- The six presented scientific theories are, however, well-known. The order represents a continuum from subjective (idealism) to objective (positivism);
- Dealing with the philosophy of sport science is very often cut short, due to time constraints and an unwillingness to deal with philosophical issues;
- The major topics of sport philosophy, besides epistemology and scientific theory which are also of interest for sport science are: anthropology, ethics, social philosophy, philosophy of movement, philosophy of play, etc.

Ethics of sport science

Merton (1973) described four sets of values that make up the ethos of modern science:

- Universalism (no evaluation derives from the scientist as person);
- Communality (openness of research results);
- Objectivity (no personal/subjective motives);

- Organised Scepticism (everything has to be examined).

To this list can be added four major problems in ethics of sport science:

- Use of persons as source of data for research;
- Announcing scientific results;
- Ideology within sport science;
- Autonomy of sport science.
-

Characterisation of the ethics:

- Ethics first of all is a classical part of the discipline of philosophy which has become of increasing importance in the present social situation;
- Ethics is of high relevance for the phenomenon of sport, the educational dimension

  called sport education, and for the academic discipline of sport science;
- The norms of Merton (1973) have been discussed for many years in regard to ethics of science, but nevertheless are still valid today;
- The indicated problems in ethics of sport science are just examples which have to be observed in dealing with sport science;
- Many parts of the systems of the social reality are today in need of ethic-moral standards to be observed. Science, however, engaged in finding the truth, is even more challenged to observe ethical standards, especially since fair play is a major issue of the world of sport.

Information network

Network of published material	**Network of organisations and institutions**
Books (various categories)	State-based level
Journal	NGO-level
Audio-visual material (CD, DVD, video, film etc.)	Economic units

Some comments can be made about this area for clarification:

- The present age is also called the information age, being characterised by a lot of available information, by information which is changing often and which is quickly becomes out-dated.

- The inventions of the world of computers and information technology are furthermore providing an abundance of channels by which we are constantly informed and give information to others;
- The network of 'published material' is increasing nationally and internationally at a speed which hardly can be followed, especially when one considers the two aspects of print-form and IT-form;
- One network dealing with 'organisations and institutions' offers abundant sources for information which is proving that the world of sport, sport education, and sport science is very globalized;
- The information network is an indispensable condition of sport science, especially when one looks at the reality of a research process with the steps 'review of literature' and 'ways how to transfer research results to practice'.

Body of knowledge of sport science

Sport Scientific Disciplines are made up of a number of Thematic Areas of Sport Science

- It is necessary to understand the indicated dual approach in order to really grasp the wide range of issues characteristic of movement, play and sport;
- The 'Sport Scientific Disciplines' of sport science have increased constantly and will continue to do so. It is also important to understand the 'intra-relationship' of a sport scientific discipline to its related science;
- The 'Thematic Areas of Sport Science' have increased constantly and will continue to do so. It is also important to understand the 'inter-relationship' of a number of sport scientific disciplines in order to bring together the scientific knowledge in regard to a 'Thematic Area of Sport Science';
- The huge body of knowledge around *movement, play and sport* is justifying a new academic field has been established called sport science;
- Besides the questions of *function*, *research methodology* and *theory-practice relationship*, the issue of *body of knowledge* is one of four major issues which stand for the self-evidence of sport science.

Research methodology for sport science

A number of topics need to be examined when discussing research methodology, including the following:

- Philosophical foundations of science and research;
- Research methods;
- Research designs;
- Techniques of data collection;
- Techniques of data analysis;
- Transfer of research results to practice.

Sport science transfer

Sport Practice	→ Sport Science	→ Sport Theory	→ Sport Syllabus	→ Sport Practice

Example:

Relation to a sportive movement	Science of movement	Motor learning	Ten ways for how to learn movements	Realisation of a sportive movement

Researching in Sport Science

Researchers need to be familiar with some basic terminology, such as:

Functions of research: exploration, description, explanation;

Dimensions of research: primary/evaluation research, scientific counselling;

Research process: discovery, realization, application.

In addition, some issues include:

- Research is a complex construct with various functions which also depend, to a certain extent, on the scientific theory to which a researcher is subscribing;
- There are various dimensions of research. All three dimensions indicated should be seen as of equal importance and not hierarchical, since all three dimensions have their right for existence;
- The indicated five research paradigms represent major ways of research designs. The qualitative-quantitative paradigm is used worldwide, but it is not logic in itself because qualitative research also can be based on quantities (numbers);
- Therefore, the distinction data coded in words or/and numbers is a better and more logical representing the research process;
- In summary, the three steps of the research process - discovery, realisation, application - have to be followed carefully in regard to data which relates closely to the issue of science transfer.

Teaching in sport science

Distance teaching/learning	**Personal presence teaching/learning**
E-teaching (e.g. Moodle/Ilias)	Lecture
Video conferencing (e.g. Adobe-Connect)	Seminar, exercise
Internet phone (e.g. Skype)	Tutorial, preparatory course

Some other factors to consider include:

- There is a close relationship between teaching and researching in sport science due to the fact that in the world of academia *learning by researching* is considered to be an effective approach to learning;
- Furthermore teaching in sport science requires also a good knowledge of research methodology since the content of teaching is scientific content which was gained by research;
- One avenue for teaching/learning is the personal presence model, where a teacher and a learner can interact directly. Another avenue is the distance teaching/learning;
- The fast development in technology has opened many possibilities to be used in the personal presence model. The distance model depends much more on instructional technology;
- A compromise seems to be the solution for the future in two directions: using presence and distance approaches and using print- as well as IT-material.

Inter-disciplinarity related to sport science

This area raises some important issues for researchers and teachers, such as:

Cross-disciplinary-Trans-disciplinary

- Institutional inter-disciplinary, including

  Independent basic scientific disciplines;

  Additive sciences;

  Inter-disciplinary science.
- Inter-disciplinary theory (e.g. PE teaching)

  Sportive competence;

  Scientific competence;

  Social-active competence;

  Teaching competence.
- Inter-disciplinary research

  Methodological inter-disciplinarity;

  Intra- (relation science for a sub-discipline) and inter- (relation of one sub-discipline to other sub-disciplines) of sport science.

Today the world of academia, of science and research, is characterised by a constantly increasing process of differentiation and specialisation which is legitimate in order to continuously produce new scientifically proven knowledge. This requires, however, on the other side a comprehensive and holistic thinking by which various parts can be seen in this mutual relationship and thus constituting a unit.

The quest for inter-disciplinarity is a way, how to introduce holistic thinking in the world of science and research as well as in teaching. Furthermore, many research issues are today so complex and multidimensional that triangulation is necessary, this means using several approaches for data collection and data analysis.

All of this tends towards a dialectic understanding between differentiation and integration, where inter-disciplinarity is a major possibility in order to realise such a dialectic understanding in sport science.

Globalisation/Inter-disciplinarity

It is possible to construct a theory of concentric circles: local, province, state, world:

- It is fact that the world today is a globalised and internationalised world which also has consequences for the area of sport, sport education and sport science;
- It is important that globalisation and internationalisation are not only realised by the economic world, governed by the paradigm of making profit;
- It is of utmost importance that the world of culture in which sport, sport education and sport science represents a major part is also contributing to a globalization and internationalisation which is governed by humanistic principles.

Mess and Haag (2011) make clear how important holistic considerations and structures are for a sound understanding of sport science. In this case, research methodology is the central focus for an adequate holistic perception of sport science.

References

Merton, R. K. (1973). The Normative Structure of Science. In R. K. Merton, *The Sociology of Science. Theoretical and Empirical Investigations* (pp. 267–280). Chicago, Ill.: University of Chicago Press.

Mess, F. & Haag, H. (2011). *Informationswege zu Sport, Sporterziehung und Sportwissenschaft* [Information avenues to sport, sport education and sport science] (2nd. ed). Schorndorf: Hofmann

Contact

Prof. em. Dr Dr h.c. Herbert Haag, M.S.
Christian-Albrechts-University of Kiel
sportpaed@email.uni-kiel.de

REVIEW: Trends and Development Perspectives for Research Methodology on a National and International Level

Herbert Haag

In order to present trends and development perspectives for research methodology (KMRM) the Kiel Model of Research Methodology was developed for sport science is chosen as an example. The reason is the fact that it represents a basic structure of Research Methodology (RM) which is logical for the realisation of research and which can guide the work of the researcher (Strauß & Haag, 1994; Strauß, Haag & Kolb, 1999).

The following six factors therefore can serve as guiding principle for this analysis:

1. Foundation of philosophy of science
2. Research methods
3. Research design/ planning of investigations
4. Techniques of data collection
5. Techniques of data analysis
6. Science transfer

For each section information is given on new RM literature, related mainly to general aspects of RM. In the list of references (contained in the appendix) the exact bibliographic information is given. It has to be mentioned that a selection of book companies which are publishing literature related to RM is the basic concept.

- Related to the general and international level there are new publications for RM of Sage publishers and the Routledge publishers (both based in the UK).
- Related to the general and national level there are especially publications by the Hogrefe Company.
- Related to the sport science and the international level there are for example Human Kinetics (US), Routledge (UK) and Logos (Germany).
- Related to sport science and the national there are especially the Hofman Company (Schorndorf) and Meyer& Meyer (Aachen).

The following matrix can give an overview:

	International	**National**
General	Sage, Routledge	Hogrefe
Related to Sport Science	Human Kinetics, Routledge, Sage, Logos	Hofmann, Meyer & Meyer

Related to this review the following points are if importance:

- The aspects should be made especially clear in which ways the KMRM has been further developed.
- By looking at selected literature at the international and national level (especially general but also related to sport science) tendencies have to be analysed, in which the discussion on RM develops; a direction can be shown which is important for a further development of the KMRM.
- The fact that many publications are available literature related to RM is not a necessary part of science but more and more a dynamic factor of the development of science. This is true for teaching and research.

The following literature can serve as a basic introduction to RM on the international and national levels:

- General: Clough & Nietbrown, 2012; Holosko & Thyer, 2011.
- Sport science related: Atkinson, M. 2011; Brown & Holloway, 2012; Haag, 2010; Heinemann, 1998; Jones & Gratton, 2003; Strauß & Haag, 1994; Strauß, Haag & Kolb, 1999; Thomas, Nelson & Silverman, 2005.

This review can only have exemplary character at the general national and international level. This, however, can have a very positive influence on the RM discussion related to sport science.

References

Atkinson, M. (2011). *Key Concepts: Research Methods in Sport, Exercise and Health Science.* London: Sage.

Clough, P., & Nutbrown, C. (2012). *A Student's Guide to Methodology.* London: Sage.

Haag, H. (2010). *Research Methodology for Sport and Exercise Science (Bewegung / Spiel / Sport).* Berlin: Logos Verlag.

Heinemann, K. (1998). *Einführung in die Soziologie des Sports.* Schorndorf. Hofmann.

Holosko, M., & Thyer, B. A. (2011). *Pocket Glossary for Commonly Used Research Terms.* London: Sage.

Jones, I., Brown, L., & Holloway, I. M. (2012). *Qualitative Research in Sport and Physical activity.* London: Sage.

Jones, I., & Gratton, C. (2003). *Research Methods for Sports Studies*. New York: Routledge.

Strauß, B., & Haag, H. (Eds.) (1994). *Forschungsmethoden – Untersuchungspläne – Techniken der Datenerhebung in der Sportwissenschaft.* Schorndorf: Hofmann.

Strauß, B., Haag, H., & Kolb, M. (Eds.) (1999). *Datenanalyse in der Sportwissenschaft. Hermeneutische und statistische Verfahren.* Schorndorf: Hofmann.

Thomas, J. R., Nelson J. K., & Silverman, S. (2005). *The Research Process in Sport, Exercise and Health: Case Studies of Active Researchers*. Champaign, IL: Human Kinetics.

Contact

Prof. em. Dr Dr h.c. Herbert Haag, M.S.
Christian-Albrechts-University of Kiel
sportpaed@email.uni-kiel.de

CURRENT ISSUES

ICSSPE News

Communities and Crisis – Inclusive Development through Sport 2015

ICSSPE hosts the 8th edition of the *Communities and Crisis – Inclusive Development through Sport* seminar from 2nd to 7th November 2015.

The training will enable participants to deliver psychosocial support programmes in social problem and crisis areas. International experts from the fields of sociology, psychology, social work and physical activity/education will deliver this hands-on training programme aimed primarily at first-line service providers and graduate students with various disciplinary backgrounds from around the world. The seminar offers not only practical and theoretical learning sessions, but also aims at fostering the exchange of ideas and good practice examples between participants and speakers.

Opportunities and Challenges in Sport

The Federal Ministry of the Interior, Germany, and the Ministry of Culture and Sport, Israel, in co-operation with ICSSPE, jointly held on 8th October 2015 in Berlin a symposium, entitled Opportunities and Challenges in Sports - Bilateral German-Israeli Symposium. The knowledge exchange between Government members and specialists as well as invited guests, began by looking back at 50 years of diplomatic relations between the countries and the different ways, actors in sport and sport politics used to re-approach the people of both countries. The second part of the symposium was devoted to a number of current issues in sport politics, namely the usage of sport for development programmes to advance community development, necessary steps to advance participation opportunities for all members of society, the need to support sport with nationwide programmes and sufficient infrastructure, as well as the protection against corruption, illegal betting and match-fixing.

Growing Commitment towards Physical Activity

Both the WHO Regional Office of Europe and the European Commission emphasise the importance of physical activity to counteract the growth of non-communicable diseases. The World Health Organisation is currently developing a European Physical Activity Strategy for the years 2016 to 2025 and invited stakeholders to comment on the current draft of the strategy. Parallel to WHO's initiative, the European Commission provides opportunities for expert organisations in health-enhancing physical activity to contribute to the policy work of the Directorate-General for Education and Culture. ICSSPE had been invited to both initiatives as consultant and welcomes and supports them actively.

ICSEMIS 2016 now online!

The ICSEMIS 2016 website is now online and will give all needed information on this very unique event in 2016. Further information and registration can be found at http://www.icsemis2016.org/ .

New ICSSPE Perspectives Book on "Elite Sport and Sport-for-All: Bridging the Two Cultures?" published by Routledge

ICSSPE announced in August the publication of the latest volume in the ICSSPE Perspectives series - 'Elite Sport and Sport-for-All: Bridging the Two Cultures?' Edited by former ICSSPE President, the late Margaret Talbot, and Richard Bailey, the publication addresses a central dichotomy in sport policy and, as such, is important reading for all students, researchers, policy-makers or administrators working in sport development and policy. Sport is often perceived as being divided into two separate domains: mass participation and elite. In many countries, policy and funding in these two fields are managed by separate agencies, and investment is often seen as a choice between the two. Elite Sport and Sport-for-All explores the points of connection and sources of tension between elite and mass participation sport. The book's multi-disciplinary and international line-up of contributors seeks to define, examine, and develop solutions to this problematic relationship.

Further Engagement in Education

ICSSPE is a member of the Value Education Partnership of UNESCO, IOC, WADA, IPC and the International Fair Play Committee. In cooperation with several members of AIESEP, all parties are jointly developing toolkits to teach and promote central values of sport. The toolkits address all teachers engaged in value education. Members of the network have taken an active role in supporting UNESCO with piloting their Quality Physical Education Guidelines for Policy Makers in several countries.

The Council is also a main advisor for Nike Inc. and the German development agency GIZ who have formed a strategic alliance to promote physical activity and sport for development on school level. Though this is a global policy development initiative, GIZ and Nike have chosen South Africa and Brazil as pilot countries, where they intend to develop cooperation with several schools and teacher training institution to help raising the amount of daily physical activity and to offer better physical education opportunities. At the same time they seek to collaborate with the government institutions in order to promote the development of supportive policies which will help to raise awareness for the benefits of physical education and sport for development.

Healthy Body and a Sound Mind? Does physical fitness improve cognition?

Richard Bailey

The Roman poet Juvenile, writing around the 1st Century AD, famously popularized the view that there was a close relationship between physical health and mental power, with the maxim:

"*Mens sana in corpore sano" ("a sound mind in a healthy body")*

In fact, Juvenile was probably paraphrasing an earlier saying attributed to the ancient Greek philosopher Thales, writing around 600 BC, and who is variously identified as the first philosopher and the first scientist. Thales offered a simple prescription for the good life that still seems plausible today:

"*Who is happy? 'The person who has a healthy body, a resourceful mind and a docile nature.'*

It is Juvenile who is usually credited with starting the long tradition of linking the development and functioning of the mind and of the body that continues to the present day. In fact, for most of this time this tradition competed rather unsuccessfully with another, present in the writing of an earlier Greek thinker, Plato, and certain strands of the Christian religion, but most commonly associated with the French philosopher René Descartes. This 'Cartesian' view portrayed the body not as an inseparable partner of the mind, but as its rather low-rent vessel. It is not difficult to see the influences of this view on most models of schooling and their distinctively disembodied conceptions of human beings, in which the mind is both the subject and object of education, and the body is relegated to a service role that is separate and inferior.

It is only quite recently that science has really caught up with the insights of the ancient Greek to the extent that it can now speak with confidence about the relationships between the body and the mind, and from the perspective of our interests, between physical activity and mental functioning. The evidence is beginning to suggest that Juvenile and Thales may have been on to something.

As was discussed in my last Bulletin article, serious interest in this issue among researchers can be traced back to the 1960s and 1970s, when scientists began to undertake simple experiments assessing the relationships between levels of physical activity, intellectual performance and educational achievement. At the time, ambition and interest were not matched by access to robust scientific measures, so findings remained frustratingly cautious. More rigorous scientific investigations of the relationship of the brain and physical activity began in the early 1980s, due in large part to advances in scientific measurement and tools. It was around this time, for example, that researchers discovered that physical activity led to an increase in the secretion of endorphins (hormones secreted within the brain and nervous system with a number of physiological functions). This effect was found to be linked to a variety of psychological changes, such as positive mood state changes and improved concentration, and physical changes to the brain, such as increased blood flow, growth of nerve cells in the brain's center of learning and memory, increased density of networks of nerve cells, and increased brain tissue volume.

Numerous tests and measures have been developed since this time. Some of these infer cognitive processes from the observation of behavior (such as the ability to pass psychological or educational tests), while others have been developed that allowed direct measures of brain activity (such as Functional

Magnetic Resonance Imaging, fMRI, and Electroencephalography, EEG). The development of these sorts of technologies has offered a new perspective on the subject of physical activity, fitness, and learning.

Let us focus, for now, on the issue of physical fitness.

It now seems fairly clear that increased physical fitness, especially cardiorespiratory (aka aerobic) fitness, positively effects the brain in numerous ways. Some of the most impressive evidence comes from older people, for whom improved physical capacity can significantly enhance both the quality and quantity of life. Research with children and young people is less advanced, but it is becoming increasingly apparent that fitness is associated with improved cognitive functioning among this group, too. In fact, it seems safe to say that cognitive functioning of people of all ages benefits from increased levels of physical fitness.

There have now been many scientific studies in this area, and I will discuss some of the most significant of these in later blog posts. Let me just mention one particularly interesting set of findings that came from Sweden and examined physical fitness, intelligence performance, and school achievement. This was not an intervention or experiment, but rather was a statistical analysis of a huge sample of data (from 1,221,727 people), from every man born from 1950 through 1976 who were enlisted for military service at age 18. Analysis of this data set revealed a positive association between cardiovascular fitness and performance in intelligence tests at age 18, and changes in physical fitness measures between 15 years and 18 years predicted cognitive performance at 18 years. In addition, it was found that cardiovascular fitness during early adulthood predicted socioeconomic status and educational attainment later in life. So the contribution of increased fitness on cognitive functioning seems to trigger a ripple effect that can 'nudge' towards improved performance in related domains, such as examination success and later employment.

While there is a growing consensus regarding the cognitive virtues of physical fitness among researchers, there remains some debate about the underlying neurological mechanisms. Many researchers discuss the "executive function hypothesis", which frames discussions of fitness in terms of its influence on the cognitive processes required to select, organize, and properly initiate goal-directed actions. The authors of the Swedish study interpreted their findings in terms of two other hypotheses: "the brain plasticity hypothesis," according to which fitness supports the brain's ability to adapt to external conditions and challenges; and the ''cardiovascular fitness hypothesis," in which cardiovascular or aerobic fitness acts as a mediator of changes to cognitive functioning.

Experimental studies offer support for these findings. Specifically, intervention(link is external) studies(link is external) using vigorous aerobic-based exercise in children reported improved performance in a range of cognitive tasks. Interestingly, the effect seems to be restricted to cardiovascular fitness and does not include muscular strength, which suggests that it is greater cardiovascular efficiency that facilitates cognitive functioning. In other words, fitter people's brains work more effectively.

From the point of view of education, the effects reported here make a compelling case, since they go to the heart of learning and achievement in school. The improvements to mood and concentration enhance what could be called the mindset of learning, because fitter children tend to approach academic tasks with a more positive attitude and greater attention than their unfit peers. At the same time, the changes to the efficient functioning of the brain relate to the mechanisms of learning. In other words, the evidence from these tests suggest that physical activity can improve students' mental state while learning, and the efficiency with which they learn.

If a pharmaceutical drug was available that had been demonstrated to have such positive effects on children's performance at school, I suspect that even the most cautious of parents would be lining the streets outside pharmacies. Physical activity is not a wonder drug, it has no harmful side effects, and it is free!

Contact

Dr Richard Bailey
International Council of Sport Science and Physical Education (ICSSPE)
rbailey@icsspe.org

The Social Effects of Individual Sport: A New Approach to Aikido as a Sport for Peace and Development

Sofia Arthurs-Schoppe

(c) Robert Kent

The social integration theory is based on the idea that participation in sport as a social activity reduces defiance and hostility amongst individuals, a theory that has been popular in sociological thought since the time of Durkheim (Durkheim, 1957).

Extensive studies in the field of mental health have revealed that individuals integrated within a societal context often share religious, political or moral beliefs which provide a sense of mutual 'moral support' while collectively maintaining the functionality of that society. In contrast, individuals in a state of 'egoism', lacking support from others and a feeling of control, experience considerable mental strain and are significantly more susceptible to mental health disorders, such as depression (Vilhjalmsson & Thorlindsson, 2005). Supporting these claims are social network studies of adult populations reporting that "constant informal interactions amongst close friends and relatives" can be correlated to increased life spans (Berkman & Syme, 1979)

Physiologically, sports have been shown to improve both physical and mental health, where the results are dependent on exercise workload and regularity, whilst providing a medium through which like-minded individuals may interact, thus positively affecting social integration. This perspective claims that exercise promotes health "not by fostering specialized skills but rather by improving overall conditioning" (Blumenthal & McCubbin, 1984). The physical health benefits of regular sport range from decreasing the risk of arteriosclerosis to improving maximal cardiac output, amounting in an average lower mortality rate amongst active individuals (Paffenbarger, Hyde, Wing, & Hseih, 1986). Psychological benefits include lower fatigue, anxiety, depression and a general increase in positivity. These effects can be partially attributed to increased levels of endorphins and regulation of nor-epinephrine levels (Cronan & Howley, 1984), whilst the extent of which these benefits are due to the integrative effects of sports settings is not yet clear.

In recent years many international organisations have recognised the merit of this theory prompting the development of the 'Sport, Development and Peace' (SDP) sector. This sector utilises sport as a "socio-

cultural tool to reduce social tensions and promote reconciliation and reconstruction, notably in post-conflict contexts" (Giulianotti, 2011). The deployment of such tactics has primarily been within the Balkans, the Middle East and areas of West-Central Africa. Recognising the success of this initiative, the United Nations named 2005 as its International Year of Sport and Physical Education, noting peace and development as axial principles (UN General Assembly, 2006). Sports often selected as focal points in these initiatives include football and baseball, whereas sports more centred on the individual (such as tennis or swimming) are very infrequently chosen primarily because individual sports are deemed less effective than team sports when promoting community orientated ideals and co-operations (Guilianotti, 2011).

Challenging these statements, various organisations have begun to research the developmental effect of individual sports. These studies are based on the premise that the psychological effects of frequent exercise and informal interaction with peers can promote the values of societal integration and understanding across various demographics. Canada is a nation that has continually expressed support for this theory through donations and assistance via the Colombo Plan for Co-operative Economic Development in South and Southeast Asia in 1950 and later, by promoting participation in sport as a tool for personal and community growth within its borders (Darnell, 2010). However, even these studies are conducted within an arguably narrow scope of mainstream sports, such as the aforementioned.

Occasional investigations into the potential of martial arts as means for growth are beginning to emerge in various publications, particularly those based in the United States, yet also throughout the world (Giulianotti, 2011). Due to its origins, Aikido has been identified as an activity with great potential to facilitate the goals of the SDP sector (Friedman, 2005). A study was undertaken to investigate the success of Aikido as a medium to facilitate discussion and foster peaceful relationships between individuals over a wide spread of demographic and geographic social groups. The focal point of this study was the international Training Across Borders (TAB) Seminar, 2015, conducted in Loutraki, Greece. Organised by Aiki Extensions, this seminar focussed on the core principles of Aikido - *inner-strength, compassion, and respect* - as defined by Morihei Ueshiba- the sport's founder (Ueshiba, 1992).

Consideration of the Gentle Warriors Programme (Twemlow, Nelson, Vernberg, & Fonagy, 2008) lead to the development of expectations of this study including the observation of increased social awareness amongst participants and elevated levels of empathy throughout the group.

In spite of the preliminary results, implementation in real world settings has lagged and thus, quantified evidence is lacking, which is a factor restricting further development in this field.

Methods

Throughout this seminar a sample group of 90 individuals with prior Aikido experience gathered to train together and discuss various issues of global importance. The aims of the four-day seminar included eliminating the prejudices of social disparities, providing a platform for informal interaction and potential collaboration, between individuals regardless of existing geographical limitations and collectively addressing global issues such as conflict and poverty.

Selection for this event was holistically meritorious allowing for a greater diversity amongst participants, whilst the controlled variable was primarily each individual's experience in the art of Aikido and a shared goal of striving for social justice through innovative means. The resultant sample group contained individuals with

a multitude of different educational qualifications, in an age range of 13-73, with geographic representation from five different continents, 18 different countries.

Throughout the seminar participants were located within the Loutraki Sports Camp with identical conditions including food and living. Participants were given the freedom to access a variety of workshops and training sessions whilst behavioural observations were made to assess the influence of Aikido on thought processes and relationships built. The activities provided included an assortment of interactive presentations from participants related to sport and peace within their own communities and the applicability of the principles of martial arts in fields including therapy and youth development. Additionally a minimum of four hours of Aikido training sessions were offered each day.

This investigation followed a seminar in Cyprus in 2005, serving as a pilot test, evaluation of which confirmed the sample group size and called for a more contained location (thus the reasoning behind the conditions for the 2015 TAB seminar).

Results

Outcomes of this investigation showed a decrease in participant attendance within training sessions. Within the preliminary days of the TAB seminar individuals attended the complete 4 hours, whereas a trend was observed as hours spent training was seen to decline. By the final day of this seminar, individuals trained an average of 3 hours daily, which represented a significant, 25% decrease in time that participants spent in formal Aikido interaction.

Simultaneously throughout the seminar individuals were observed to spend more time allocated to social activities and the number of participants within communal areas, such as the public seating and dining room, was seen to exponentially increase at all times of the day. Hours spent publicly engaged in dialogue increased from an average of 1.5 hours to an average of 4 hours throughout the duration of the seminar. The quantity of youth participants below 25 years of age, engaging in these social activities showed a staggering increase, whilst their attendance at controlled training sessions was below the average.

Supporting these observations was the average amount of time participants spent on the internet, which decreased from an average of 2 hours per day to 0.75 hours per day. This was seen to be inversely related to the amount of time spent engaged in social activities and decreased along with the hours participants spent in training sessions. Noteworthy is the huge increase in the amount of time individuals of all age groups spent discussing social issues and current events, this almost perfectly correlated with the decrease in internet usage.

Discussion

Results of this investigation conclusively support the hypothesis. Holistically participants were initially seen to immerse fully in the Aikido programme and spend large amounts of time online connecting with individuals not present in the seminar. These behaviours then rapidly adapted as discourse amongst participants increased and social interaction became a predominant daily activity.

This data support previous research showing that immersion in the principles of Aikido promotes social behaviour (Brawdy, 2001) while simultaneously reiterating the principles of social integration theory stating

that informal interaction between peer groups of similar interests develops mutual moral support and contributes to the functionality of a community (Blumenthal & McCubbin, 1984).

The fact that youth were seen to pertain to these behavioural trends before the majority of the sample group is a testament to the statement that relationships tend to be formed more rapidly amongst young people (Twemlow, Nelson, Vernberg, & Fonagy, 2008). Observations of increased levels of involvement between the youth at this seminar and social issues indicates that facilitating the integration of Aikido principles within the activities of young people will lead to a greater engagement of youth in current events.

As levels of integration between all participants in this seminar exponentially increased it can be seen that the theoretical potential of Aikido can be harnessed and applied in a realistic manner. The accumulation of elevated social awareness among all demographics present at this event highlights the ability of sports to transcend borders. Moreover the global aspect of this seminar suggests that these results are not isolated to a specific community or limited by societal boundaries.

This study seems to have fulfilled its goals of facilitating discussion and fostering peaceful relationships between individuals over a wide spread of demographic and geographic social groups. Whilst further study into Aikido as a utility for the field of peace and development through sport is recommended, the results already obtained imply that these experiments will be successful.

As the short time span of the TAB 2015 seminar is seen as the major limitation of this investigation, a follow up study of the TAB 2015 programme should be conducted in order to assess the long-term success of these trans-border relationships. Theoretically these should be consistent with prior studies, illustrating that increased accessibility to long distance communication methods, primarily through the internet, ensures the long life of relationships formed between peer groups of similar interests (Hayhurst, Wilson, & Frisby, 2010). This implies that this study holds future relevance.

Conclusion

Findings of this investigation comprehensively demonstrate the applicability of Aikido to situations in which peaceful relationships and collaboration is required. The rapid rate at which observations of increased social integration could be seen further verifies the potential of this sport in providing benefits to communal structure, rather than solely personal benefits. Whilst Aikido, and other martial arts, has not been extensively researched in this context, this study paves the way for further developments in the SDP field.

Acknowledgements

The author thanks the Budo for Peace organisation and Aiki Extensions for making this research possible.

References

Berkman, L. F., & Syme, S. L. (1979). Social Networks, Host Resistance, and Mortality: A Nine Year Follow-Up Study of Alameda County Residents. *American Journal of Epidemiology, 109*(2), 186–204.

Blumenthal, J. A., & McCubbin, J. A. (1984). Physical Exercise as Stress Management. *Handbook of Psychology and Health, 20*(4), 303–331.

Brawdy, P. (2001). *Exploring Human Kindness through the Padagogy of Aikido.* Seattle: American Educational Research Association.

Cronan, T. L., & Howley, E. T. (1984). The Effect of Training on Epinephrine and Norepinephrine Excretion. *Medicine and Science in Sports, 5*, 122–125.

Darnell, S. C. (2010). Power, Politics and "Sport for Development and Peace": Investigating the Utility of Sport for International Development. *Sociology of Sport Journal, 10*(4), 560–579.

Durkheim, E. (1957). *Professional Ethics and Civic Morals.* London: Routledge.

Friedman, H. (2005). Problems of Romanticism in Transpersonal Psychology: A Case Study of Aikido. *The Humanistic Psychologist, 1*(33), 3–24.

Giulianotti, R. (2011). Sport, Peacemaking and Conflict Resolution: A Contextual Analysis and Modelling of the 'Sport Development and Peace' Sector. *Ethnic and Racial Studies, 34*(2), 1–32.

Guilianotti, R. (2011). The sport, development and peace sector: A model of four social policy domains. *Journal of Social Policy, 40*(4), 40–68.

Hayhurst, L. M., Wilson, B., & Frisby, W. (2010). *Navigating neoliberal networks: Transnational Internet Platforms in sport for development and peace.* Retreived from: http://intl-online.sagepub.com/

Paffenbarger, R.S., Hyde, R. T., Wing, A. L., & Hseih, C.-C. (1986). Physical Activity, All-Cause Mortality, and Longetivity of College Alumni. *New England Journal of Medicine, 314*(10), 605–613.

Twemlow, S., Nelson, T., Vernberg, E. M., & Fonagy, P. (2008). Effects of Participation in a Martial Arts-Based Antibullying Program in Elementary Schools. *Psychology in the Schools, 45*(10), 3–15.

Ueshiba, M. (1992). *Aikido.* Tokyo: Shin Budo Magazine.

UN General Assembly. (2006). *Sport for Development and Peace: The Way Forward.* New York: United Nations.

Vilhjalmsson, R., & Thorlindsson, T. (2005). The Integrative and Physiological Effects of Sport Participation. *Sociological Quarterly, 33*(4), 636–647.

Contact

Sofia Arthurs-Schoppe
Aspiring journalist, scientist, advocate for peace
sofia.arthursschoppe@gmail.com

CONTACTS

Editorial Board

Prof. Dr Kari L. Keskinen
Chair Editorial Board

Finnish Society of Sport Sciences
Paavo Nurmentie 1B, Olympic Stadion
00250 Helsinki
Finland
Tel.: +358 10 778 66 03
Fax: +358 10 778 66 19
kari.keskinen@lts.fi

Prof. Dr Pedro Ferreira Guedes de Carvalho
Editorial Board Member

University of Beira Interior
Sport Science Department
Rue Marques D'Ávila e Bolama
6201-001 Covilha
Portugal
Tel.: +351 275 32 91 53
Fax: +351 275 32 06 90
pguedes@ubi.pt

Prof. Dr Carl R. Cramer
Editorial Board Member

Barry University
School of Human Performance and Leisure Science
11300 NE Second Avenue
Miami Shores, FL 33161-6695
USA
Tel.: +1 305 899 34 97
Fax: +1 305 899 35 56
ccramer@barry.edu

Prof. Dr Rosa López de D'Amico
Editorial Board Member

Centro de Investigación "Estudios en Educación Fisica, Salud, Deporte, Recreación y Danza" (EDUFISADRED)
Av Las Delicias
2101 Maracay
Venezuela
Tel.: +58 243 242 19 83
Fax: +58 243 247 46 07
rlopezdedamico@yahoo.com

Dr Keith Gilbert
Editorial Board Member

Rue de Saint John 73
2010 Geneva
Switzerland
Tel.: +44 79 12 84 98 47
gilbert.keith@gmail.com

Prof. Dr Filip Mess
Editorial Board Member

Technische Universität München
Department of Sport and Health Sciences
Georg-Brauchle-Ring 60/62
80992 München
Germany
Tel.: +49 89 28 92 45 20
Fax: +49 89 28 92 45 35
filip.mess@tum.de

Prof. Dr John Nauright
Editorial Board Member

University of Brighton
School of Sport and Service Management
Carlisle Road, Eastbourne
Sussex BN20 7SN East
United Kingdom
Tel.: +44 1273 64 37 36
J.Nauright@brighton.ac.uk

Prof. Dr Karin A. E. Volkwein
Editorial Board Member

International Association for the Philosophy of Sport (IAPS)
Department of Kinesiology
West Chester, PA 19383
USA
Tel.: +1 610 436 21 53
Fax: +1 610 436 28 60
kvolkwein@wcupa.edu

Mr Wolfgang Baumann
Vice-President 'Programmes and Services'

The Association for International
Sports for All (TAFISA)
Mainzer Landstraße 153
60261 Frankfurt
Germany
Tel.: +49 69 97 39 35 99 20
Fax: +49 69 97 39 35 99 25
baumann@tafisa.net

Mr Detlef Dumon
Executive Director

ICSSPE/CIEPSS
Hanns-Braun-Straße, Friesenhaus II
14053 Berlin
Germany
Tel.: +49 30 311 02 32 15
Fax: +49 30 311 02 32 29
ddumon@icsspe.org

Ms Katrin Koenen
Director Scientific Affairs

ICSSPE/CIEPSS
Hanns-Braun-Straße/ Friesenhaus II
14053 Berlin Germany
Tel.: +49 30 311 02 32 16
Fax: +49 30 311 02 32 29
kkoenen@icsspe.org

Mr Jens Sejer Andersen
Editorial Board Advisor

Danish Institute for Sports Studies (IDAN)/Play the Game
c/o Department of Sport Science
Aarhus University
Frederiksgade 78B, 2
8000 Aarhus C
Denmark
Tel.: +45 70 27 55 77
Fax: +45 70 27 55 79
jens@playthegame.org

Prof. Dr Anna Elizabeth Goslin
Editorial Board Advisor

University of Pretoria
Department of Sport and Leisure Sciences
Lynnwood Road
0002 Pretoria
South Africa
Tel.: +27 12 420 60 43
Fax: +27 12 420 60 99
anneliese.goslin@up.ac.za

Prof. em. Dr Dr h.c. Herbert Haag M.S.
Editorial Board Advisor

Christian-Albrechts-University of Kiel
Institute of Sport Science
Olshausenstraße 74
24098 Kiel
Germany
Tel.: +49 431 880 37 70
Fax: +49 431880 37 73
sportpaed@email.uni-kiel.de

Prof. Dr Darlene Kluka
Editorial Board Advisor

Barry University
School of Human Performance and Leisure Science
Department of Sport and Exercise Sciences
11300 NE Second Avenue
Miami Shores, FL 33161-6695
USA
Tel.: +1 305 899 35 49
Fax: +1 305 899 35 56
dkluka@mail.barry.edu

Executive Board

Dr Uri Schaefer
Acting President

Ministry of Culture and Sport
Hamsger 14 Street
61575 Tel Aviv
Israel
Tel.: +972 3 636 72 03
Fax: +972 3 687 04 71
uschaefer@icsspe.org

Mr Wolfgang Baumann Vice-President 'Programmes and Services'	The Association for International Sports for All (TAFISA) Mainzer Landstraße 153 60261 Frankfurt Germany Tel.: +49 69 97 39 35 99 20 Fax: +49 69 97 39 35 99 25 baumann@tafisa.net
Dr Walter Ho Vice-President 'Education'	International Society for Comparative Physical Education and Sport (ISCPES) c/o University of Macao Faculty of Education Av. Padre Tomás Pereira, S.J. Taipa Macao, China Tel.: +853 83 97 87 34 Fax: +853 28 83 16 95 walterkyho@yahoo.com
Dr Maria Dinold Speaker Associations' Board	International Committee of Sport Pedagogy (ICSP) c/o University of Vienna Auf der Schmelz 6a 1150 Vienna Austria Tel.: 43 1 42 774 88 14 Fax: 43 1 42 774 88 19 maria.dinold@univie.ac.at
Prof. Dr Kari L. Keskinen Chair Editorial Board	Finnish Society of Sport Sciences Paavo Nurmentie 1B, Olympic Stadion 00250 Helsinki Finland Tel.: +358 10 778 66 03 Fax: +358 10 778 66 19 kari.keskinen@lts.fi

Ms Susi-Käthi Jost
Treasurer

International Association of Physical Education & Sport for Girls & Woman (IAPESGW)
Ob. Aareggweg 114
3004 Bern
Switzerland
Tel.: +41 31 302 41 89
Fax: +41 31 302 41 89
susi-kathi.jost@bluewin.ch

Mr Detlef Dumon
Executive Director

ICSSPE/CIEPSS
Hanns-Braun-Straße, Friesenhaus II
14053 Berlin
Germany
Tel.: +49 30 311 02 32 15
Fax: +49 30 311 02 32 29
ddumon@icsspe.org

Prof. Dr Branislav Antala
Executive Board Member

Fédération Internationale `Education Physique (FIEP)
c/o University of Commenius
Faculty of Physical Education and Sports
L. Svobodu 9
81469 Bratislava
Slovakia
Tel.: +421 905 88 75 75
Fax: +421 2 55 64 80 71
antala@fsport.uniba.sk

Prof. Dr Rosa López de D'Amico
Executive Board Member

Centro de Investigación "Estudios en Educación Fisica, Salud, Deporte, Recreación y Danza" (EDUFISADRED)
Av Las Delicias
2101 Maracay
Venezuela
Tel.: +58 243 242 19 83
Fax: +58 243 247 46 07
rlopezdedamico@yahoo.com

Prof. Daniela Dasheva
Executive Board Member

National Sports Academy "Vasil Levski"
Studentski grad
1700 Sofia
Bulgaria
stefka.djobova@abv.bg

Prof. Dr Luminita Georgescu
Executive Board Member

University of Pitesti
Faculty of Sciences
Targu din Vale, no. 1
110040 Pitesti, Arges
Romania
Tel.: +40 740 02 23 30
Fax: +40 348 45 31 02
kinetopit@yahoo.com

Prof. Dr Annelise Goslin
Executive Board Member

University of Pretoria
Department of Biokinetics, Sport and Leisure Sciences
Lynnwood Road
0002 Pretoria
South Africa
Tel.: +27 1 24 20 60 43
Fax: +27 1 24 20 60 99
anneliese.goslin@up.ac.za

Prof. Dr Darlene Kluka
Executive Board Member

Barry University
Deparment of Sport and Exercise Sciences
11300 NE 2nd Avenue
Miami Shores, FL 33161-6695
USA
Tel.: +1 305 899 35 49
Fax: +1 305 899 35 56
dkluka@mail.barry.edu

Prof. Patrice Ranaivoson
Executive Board Member

National Academy of Sport
402 BP1 Ampefiloha
101 Antananarivo
Madagascar
ranaivospdhnation@hotmail.fr

Mr Claude Scheuer
Executive Board Member

European Physical Education Association (EUPEA)
c/o Université du Luxembourg
Route de Diekirch
7220 Walferdange
Luxemburg
claude.scheuer@uni.lu

Prof. Dr Miklós Tóth
Executive Board Member

Hungarian Society of Sport Science
Istv nmezei út 1-3
1146 Budapest
Hungary
Tel.: +36 1 460 69 80
Fax: +36 1 460 69 80
tothmik1@hotmail.com

Mr Jiang Zhixue
Executive Board Member

All-China Sports Federation (ACSF)
2 Tiyuguan Road, Chongwen District
100763 Beijing
China
Tel.: +86 10 87 18 24 18
Fax: +86 10 67 11 58 58
jz@sport.gov.cn

President's Committee

Dr Uri Schaefer
Acting President

Ministry of Culture and Sport
Hamsger 14 Street
61575 Tel Aviv
Israel
Tel.: +972 3 636 72 03
Fax: +972 3 687 04 71
uschaefer@icsspe.org

Mr Wolfgang Baumann
Vice-President 'Programmes and Services'

The Association for International
Sports for All (TAFISA)
Mainzer Landstraße 153
60261 Frankfurt
Germany
Tel.: +49 69 97 39 35 99 20
Fax: +49 69 97 39 35 99 25
baumann@tafisa.net

Dr Walter Ho Vice-President 'Education'	International Society for Comparative Physical Education and Sport (ISCPES) c/o University of Macao Faculty of Education Av. Padre Tomás Pereira, S.J. Taipa Macao, China Tel.: +853 83 97 87 34 Fax: +853 28 83 16 95 walterkyho@yahoo.com
Dr Maria Dinold Speaker Associations' Board	International Committee of Sport Pedagogy (ICSP) c/o University of Vienna Auf der Schmelz 6a 1150 Vienna Austria Tel.: 43 1 427 74 88 14 Fax: 43 1 427 74 88 19 maria.dinold@univie.ac.at
Prof. Dr Kari L. Keskinen Chair Editorial Board	Finnish Society of Sport Sciences Paavo Nurmentie 1B, Olympic Stadion 00250 Helsinki Finland Tel.: +358 10 778 66 03 Fax: +358 10 778 66 19 kari.keskinen@lts.fi
Ms Susi-Käthi Jost Treasurer	International Association of Physical Education & Sport for Girls & Woman (IAPESGW) Ob. Aareggweg 114 3004 Bern Switzerland Tel.: +41 31 302 41 89 Fax: +41 31 302 41 89 susi-kathi.jost@bluewin.ch
Mr Detlef Dumon Executive Director	ICSSPE/CIEPSS Hanns-Braun-Straße, Friesenhaus II 14053 Berlin Germany Tel.: +49 30 311 02 32 15 Fax: +49 30 311 02 32 29 ddumon@icsspe.org

The October 2015 Bulletin is planned as an “Information Broker”. Different from our usual approach, this edition is not a collection of research articles within a topic, but the editor, Herbert Haag, tries to give an overview on information on the “research methodology of sport science”, and introduces important literature in the area. The collection of articles incorporates the necessity for upcoming researchers to know how to get needed and relevant information and how to conduct high quality research.

Additional authors within the special feature are Richard Bailey, Martin Holzweg, and Ed Cope.

ICSSPE
Hanns-Braun-Strasse, Friesenhaus II 14053 Berlin,. Germany
Tel: +49 30 311 0232-10 | Fax: +49 30 311 0232-29

ICSSPE