UNIVERSITY OF NIŠ

FACULTY OF SPORT AND PHYSICAL EDUCATION

Nenad Stojiljković, PhD


TOYOTA
ŠPANOVIC


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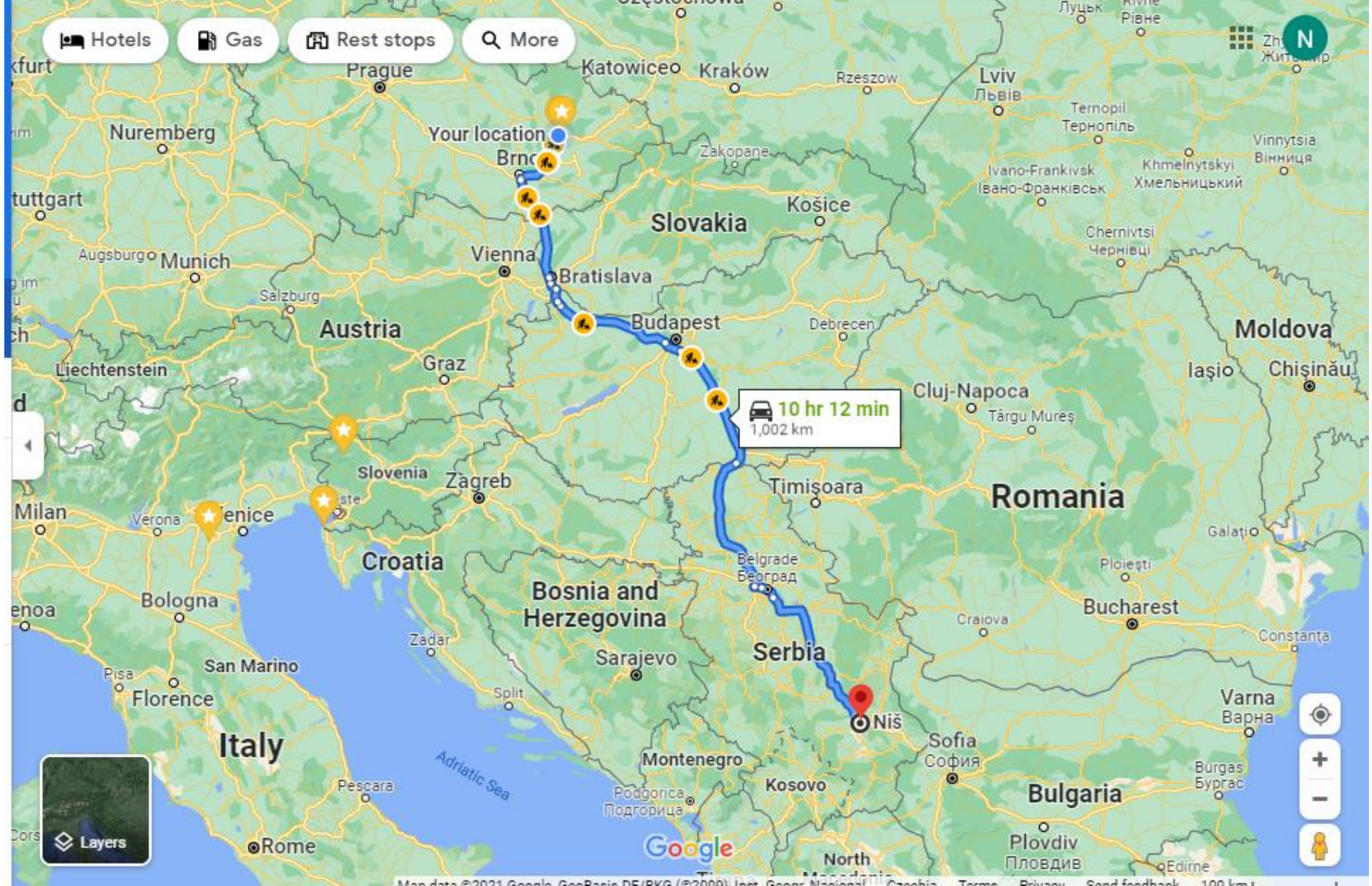
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Івано-Франківськ
Khmelnytskyi
Хмельницький
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Chernivtsi
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Graz
Iaşi
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Cluj-Napoca
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Craiova
Constanţa
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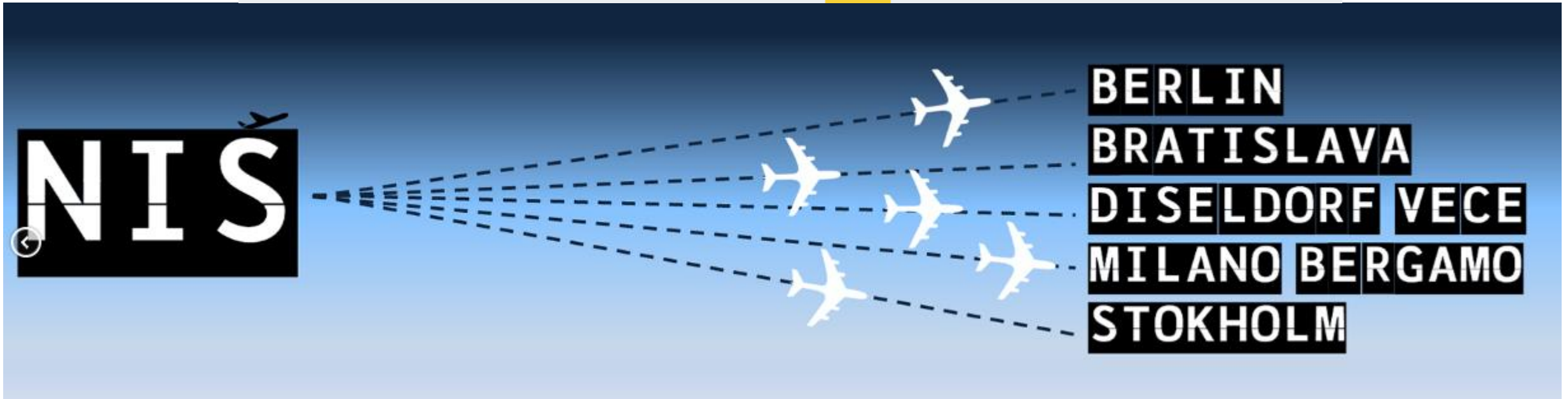
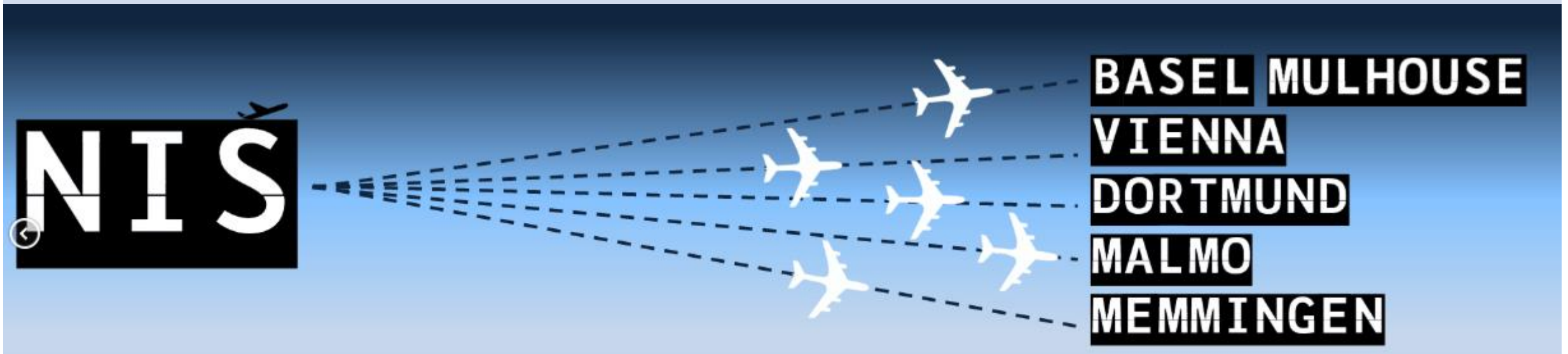
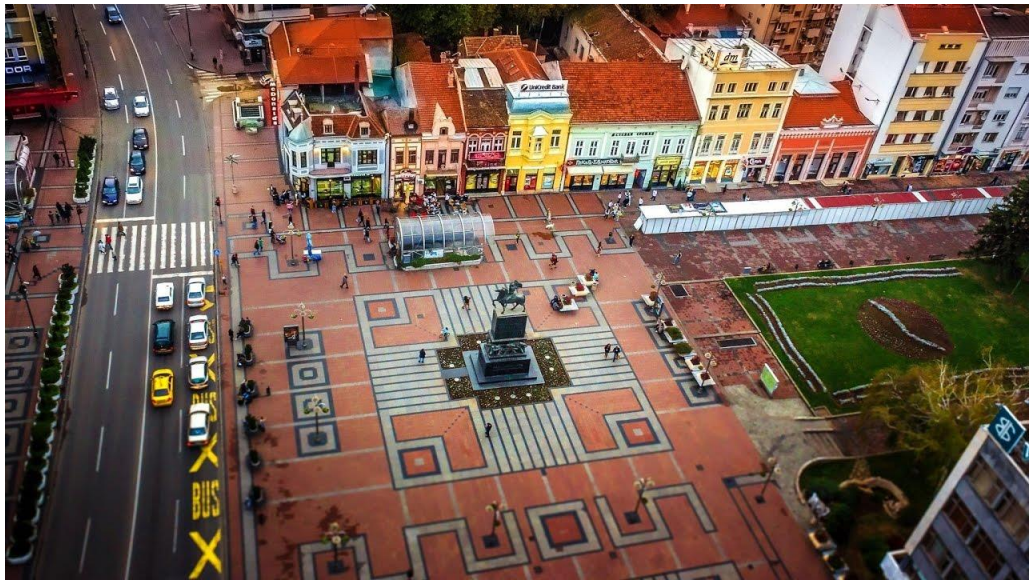
Zadar
Sarajevo
Serbia
San Marino
Pisa
Florence
Split
Niš
Varna
Варна
Sofia
София
Italy
Montenegro
Kosovo
Burgas
Бургас
Adriatic Sea
Pescara
Podgorica
Подгорица
Bulgaria
Plovdiv
Пловдив
Rome
North
Edirne
Layers
Google

NIS CONSTANTINE THE GREAT AIRPORT

HOME | FLIGHTS | PASSENGERS | AIRLINES | TO & FROM THE AIRPORT






BUS

UNIVERSITY OF NIŠ

UNIVERSITY OF NIŠ

- The University of Niš is a public university in Serbia.
- It was founded in 1965 and it consists of 14 faculties
- 1500 teachers and 630 staff and extracurricular staff
- Around 30,000 students

UNIVERSITY OF NIŠ

1. Faculty of Civil Engineering and Architecture
2. Faculty of Economics
3. Faculty of Electronic Engineering
4. Faculty of Arts
5. Faculty of Law
6. Faculty of Mechanical Engineering
7. Faculty of Medicine
8. Faculty of Occupational Safety
9. Faculty of Philosophy
10. Faculty of Sport and Physical Education
11. Faculty of Science and Mathematics
12. Faculty of Technology in Leskovac
13. Pedagogical Faculty in Vranje
14. Faculty of Agriculture in Kruševac

Shanghai Ranking's Global Ranking of Sport Science Schools and Departments

2018

151-200	**University of Ljubljana** Faculty of Sport	
151-200	**University of Maryland, College Park** Department of Kinesiology	
151-200	**University of Mississippi** Department of Health, Exercise Science and Recreation Management	
151-200	**University of Nebraska - Omaha** School of Health, Physical Education and Recreation	
151-200	**University of Nis** Faculty of Sport and Physical Education	
151-200	**University of Oklahoma - Norman** Health and Exercise Science Department	
151-200	**University of Poitiers** Faculty of Sport Science	
151-200	**University of Pretoria** Section Sports Medicine	
151-200	**University of Taipei** School of Kinesiology	
151-200	**University of the Basque Country** Faculty of Physical Activity and Sport Science	
151-200	**University of Zagreb** Faculty of Kinesiology	
201-300	**Appalachian State University** Department of Health, Leisure, and Exercise Science	

ACADEMIC RANKING OF WORLD UNIVERSITIES

FACULTY OF SPORT AND PHYSICAL EDUCATION UNIVERSITY OF NIS

2020

101-150	**University of Delaware** Department of Kinesiology and Applied Physiology	
101-150	**University of KwaZulu-Natal** Discipline of Biokinetics, Exercise and Leisure Sciences	
101-150	**University of Lausanne** Institute of Sport Sciences	
101-150	**University of Massachusetts Amherst** Department of Kinesiology	
101-150	**University of Minnesota, Twin Cities** School of Kinesiology	
101-150	**University of Mississippi** Department of Health, Exercise Science and Recreation Management	
101-150	**University of Nis** Faculty of Sport and Physical Education	
101-150	**University of Otago** School of Physical Education, Sport and Exercise Sciences	
101-150	**University of Palermo** Sport and Exercise Sciences Research Unit	
101-150	**University of Stirling** Faculty of Health Sciences and Sport	
101-150	**University of the Sunshine Coast** School of Health and Sport Sciences	
101-150	**University of Thessaly** Department of Physical Education and Sport Science	

ACADEMIC RANKING OF WORLD UNIVERSITIES

FACULTY OF SPORT AND PHYSICAL EDUCATION UNIVERSITY OF NIS

FACULTY OF SPORT AND PHYSICAL EDUCATION

- 1948. – Founded High school for education of teachers.
- 1971. – Founded Faculty of Philosophy (Department of Physical Education).
- 1999. – Founded Faculty of Sport and Physical Education.

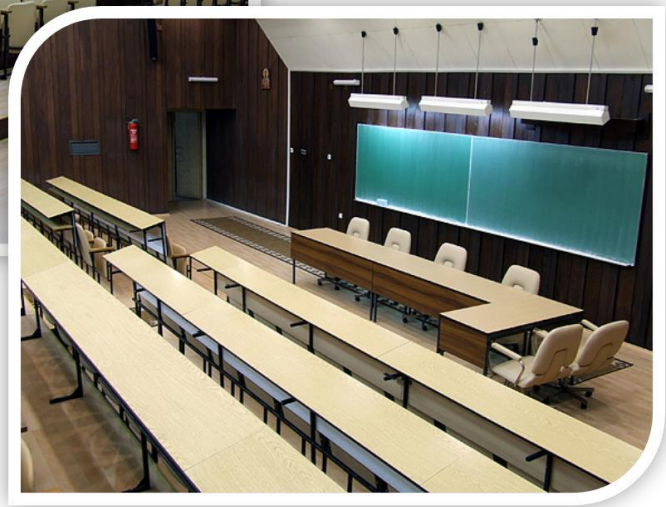
- Manager of Guangzhou R&F F.C.
- DRAGAN STOJKOVIC PIKSI
- Graduated at the Faculty of sport and physical education Niš

About the Faculty…

УНИВЕРЗИТЕТ У НИШУ

ФАКУЛТЕТ СПОРТА И ФИЗИЧКОГ ВАСПИТАЊА

- 1200 students
- 49 professors and assistants (14 full professors, 12 associate professors, 12 assistant professors, 6 assistants)
- 5 professors from other faculties



PROFESSORS OF THE FACULTY OF SPORT AND PHYSICAL EDUCATION

UNIVERZITET
U NIŠU

FAKULTET SPORTA I
FIZIČKOG VASPITANJA

Palacký University
Olomouc

Research in Sport Science: Searching for the Scientific Facts in Sport and Physical Education

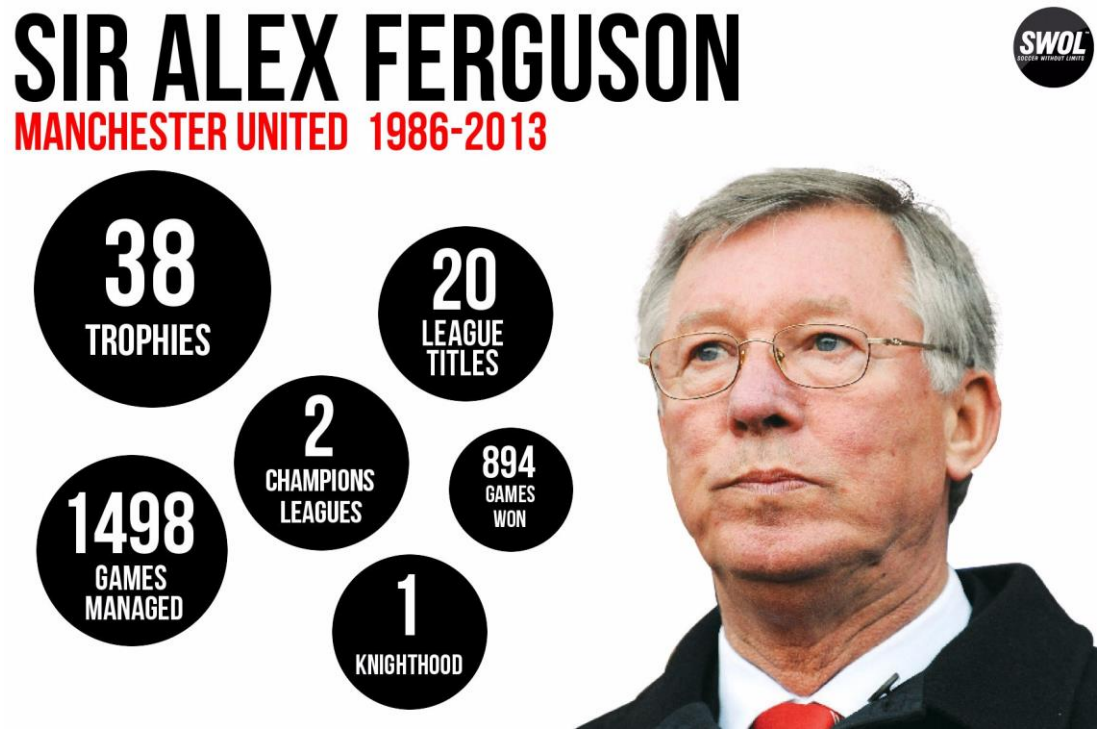
Nenad Stojiljković, PhD

WHY WE NEED A SCIENCE IN SPORT?

- to assist an athlete in maximizing his potential with the least possible risk of injury
- prediction of an individual's ability relating to the sport
- individualization of training programs according to specific needs and to identify possible strengths, weaknesses and prevent future injuries
- Solving some health related issues and prevent diseases

WHY WE NEED A SCIENCE IN SPORT?

"Sports science, without question, is the biggest and most important change in my lifetime. It has moved the game onto another level that maybe we never dreamt of all those years ago. Sports Science has brought a whole new dimension to the game".



Sir Alex Ferguson

SPORT SCIENCE (KINESIOLOGY, SPORT AND PHYSICAL EDUCATION)

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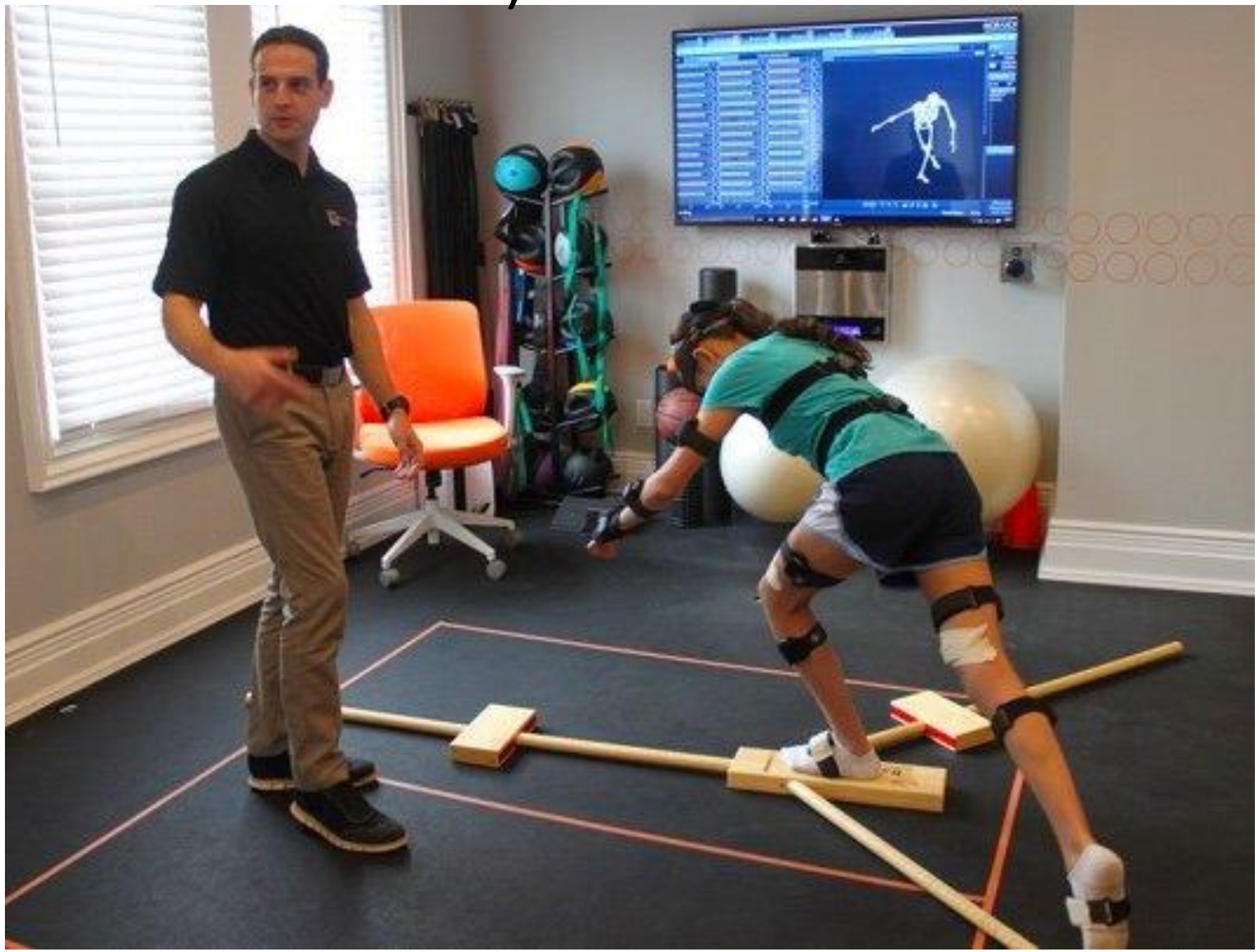

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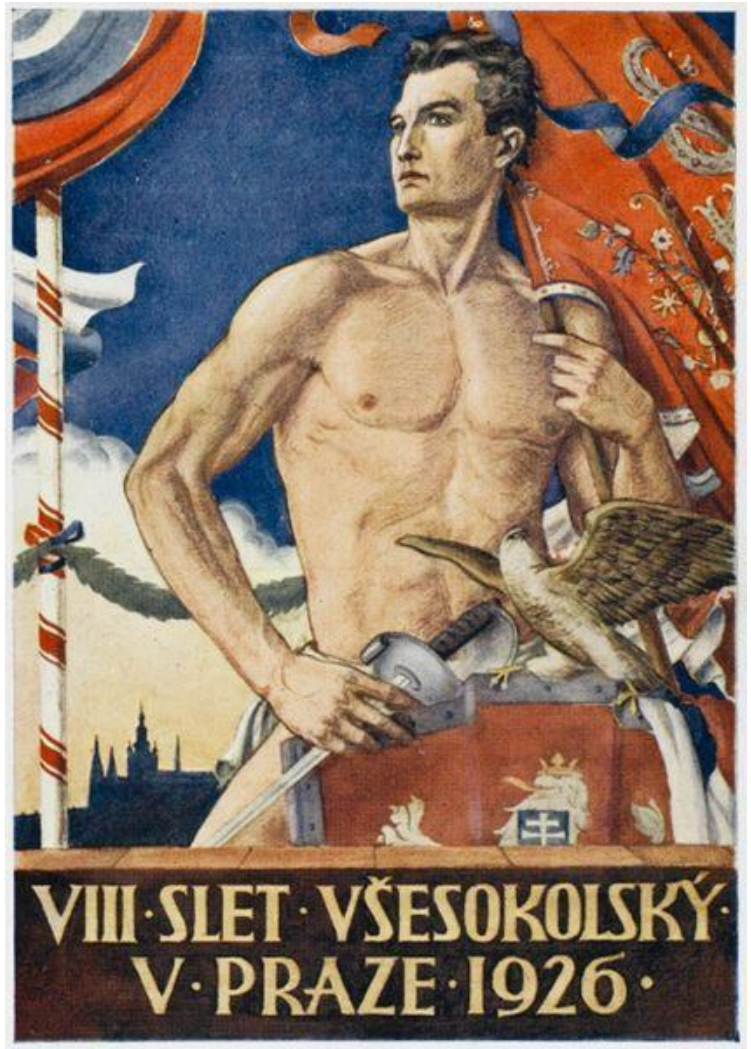
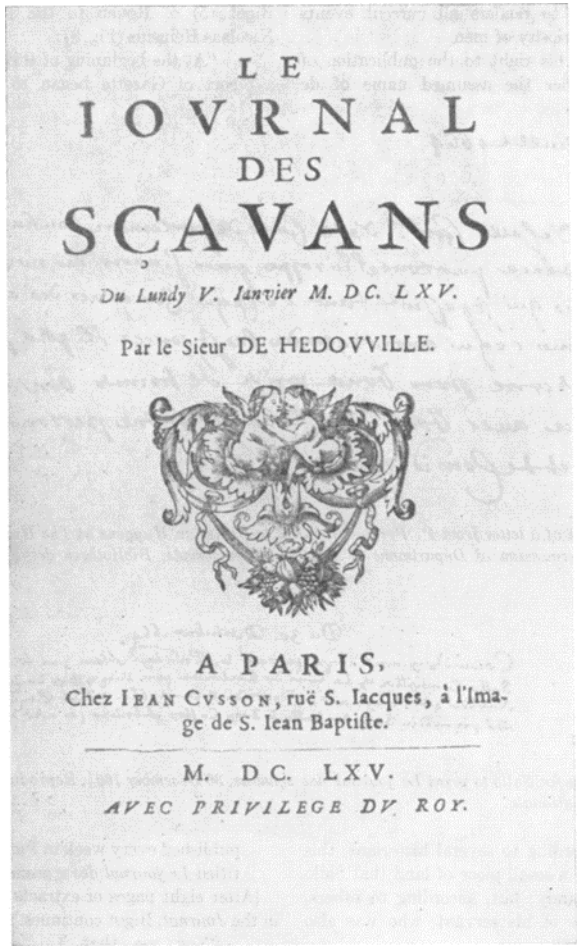


SCIENTIFIC JOURNALS



LE
IOVRNAL
DES
SÇAVANS

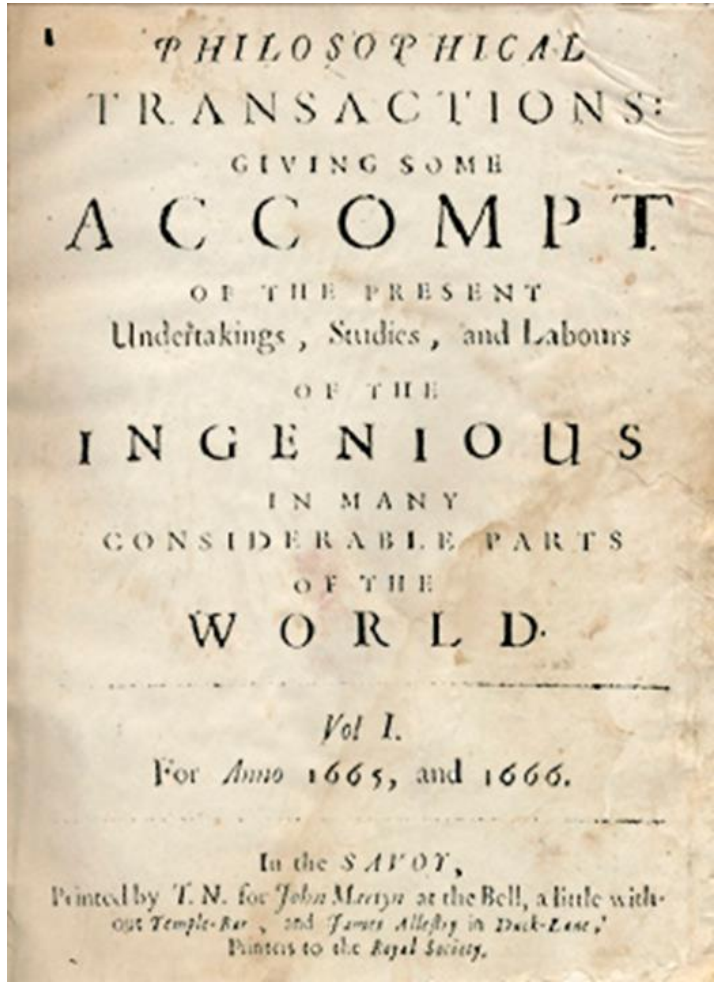
Du Lundy V. Ianvier M. DC. LXV.

Par le Sieur DE HEDOVVILLE.

A PARIS,
Chez IEAN CVSSON, ruë S. Iacques, à l'Image de S. Iean Baptiſte.

M. DC. LXV.
AVEC PRIVILEGE DV ROY.

Paris
„Journal des sçavans“ – 1665.



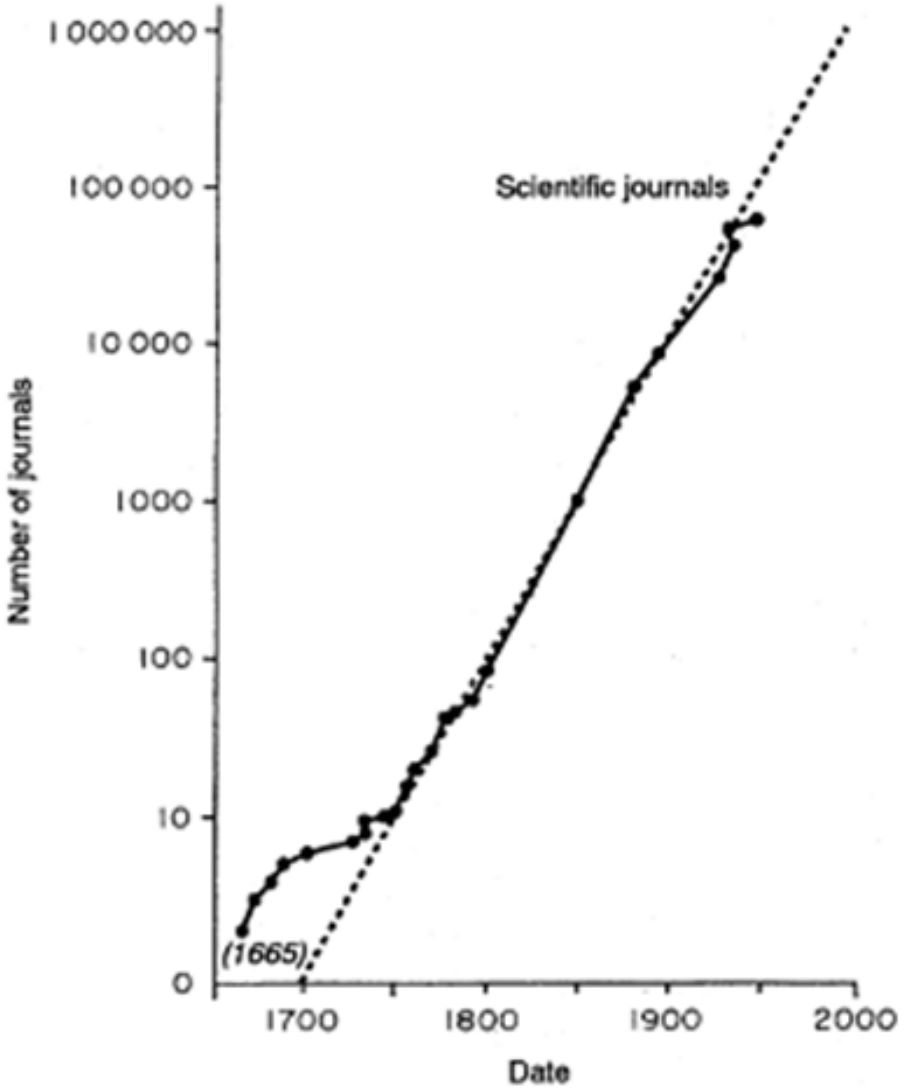
PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

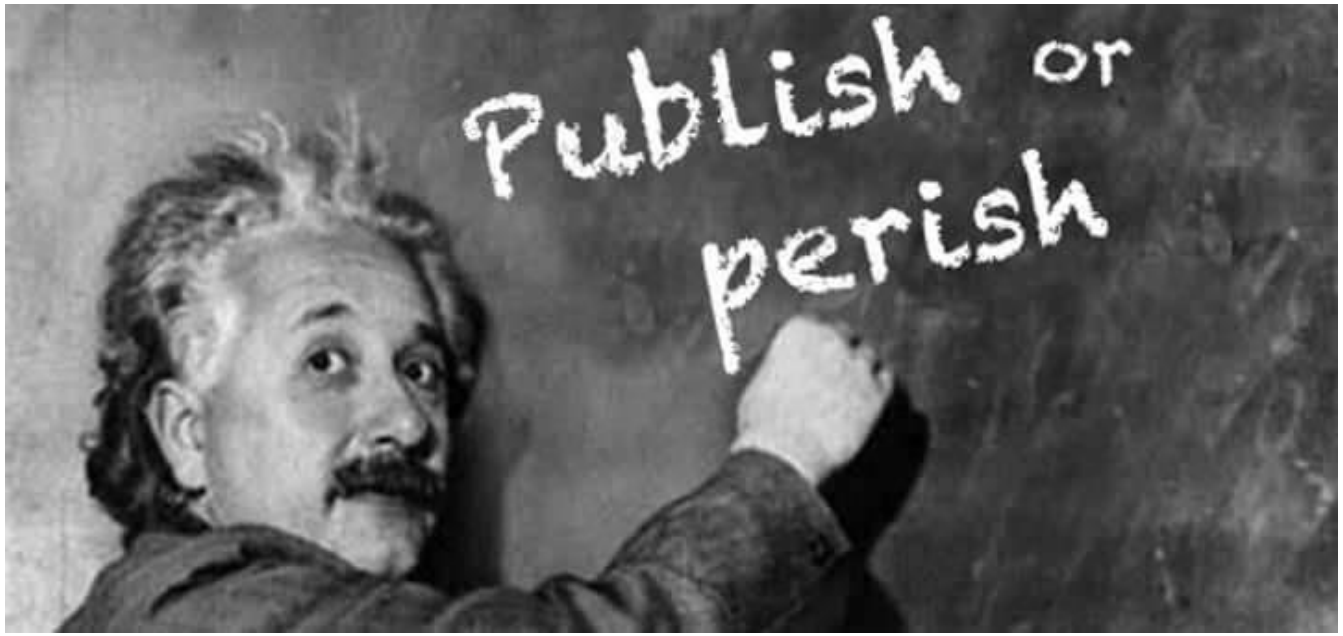
Vol I.
For *Anno* 1665, and 1666.

In the *SAVOY*,
Printed by *T. N.* for *John Martyn* at the Bell, a little without *Temple-Bar*, and *James Allestry* in *Duck-Lane*,
Printers to the *Royal Society*.

London
„Philosophical Transactions of the Royal Society“ – 1665.

SCIENTIFIC JOURNALS





Estimation of the increase in the number of the scientific journals established from 1665 to 1995 (De Solla Price, 1961)

SPORTS SCIENCE LIST OF JOURNALS 2020

ISSN	TITLE OF JOURNAL	IF 2020
0306-3674	British Journal of Sports Medicine	13.800
0112-1642	Sports Medicine	11.140
2095-2546	Journal of Sport and Health Science	7.179
2159-676X	Qualitative Research in Sport Exercise and Health	6.736
1077-5552	Exercise Immunology Review	6.308
0091-6331	Exercise and Sport Sciences Reviews	6.246
0363-5465	American Journal of Sports Medicine	6.203
0195-9131	Medicine and Science in Sports and Exercise	5.411
1550-2783	Journal of the International Society of Sports Nutrition	5.159
2199-1170	Sports Medicine-Open	4.830
1469-0292	Psychology of Sport and Exercise	4.785
0749-8063	Arthroscopy. the Journal of Arthroscopic and Related Surgery	4.772
0190-6011	Journal of Orthopaedic and Sports Physical Therapy	4.751
1543-8627	Research in Sports Medicine	4.674
1526-484X	International Journal of Sport Nutrition and Exercise Metabolism	4.599
0942-2056	Knee Surgery Sports Traumatology Arthroscopy	4.342
1440-2440	Journal of Science and Medicine in Sport	4.319
0905-7188	Scandinavian Journal of Medicine and Science in Sports	4.221
0273-5024	Journal of Teaching in Physical Education	4.155
1357-3322	Sport Education and Society	4.119

1746-1391	European Journal of Sport Science	4.050
1555-0265	International Journal of Sports Physiology and Performance	4.010
0003-9993	Archives of Physical Medicine and Rehabilitation	3.966
1941-7381	Sports Health	3.843
1064-8011	Journal of Strength and Conditioning Research	3.781
0888-4773	Journal of Sport Management	3.691
1050-642X	Clinical Journal of Sport Medicine	3.638
1041-3200	Journal of Applied Sport Psychology	3.585
8750-7587	Journal of Applied Physiology	3.532
0264-0414	Journal of Sports Sciences	3.337
0172-4622	International Journal of Sports Medicine	3.118
1728-869X	Journal of Exercise Science and Fitness	3.103
1439-6319	European Journal of Applied Physiology	3.078
1058-2746	Journal of Shoulder and Elbow Surgery	3.019
0895-2779	Journal of Sport and Exercise Psychology	3.016
1303-2968	Journal of Sports Science and Medicine	2.988
0736-5829	Adapted Physical Activity Quarterly	2.929
1650-1977	Journal of Rehabilitation Medicine	2.912
0033-6297	Quest	2.910
1062-6050	Journal of Athletic Training	2.860

0966-6362	Gait and Posture	2.840
1476-3141	Sports Biomechanics	2.832
2473-3938	Science and Medicine in Football	2.815
0860-021X	Biology of Sport	2.806
2325-9671	Orthopaedic Journal of Sports Medicine	2.727
1715-5312	Applied Physiology Nutrition and Metabolism = Physiologie appliquee nutrition et metabolisme	2.668
0890-5339	Journal of Orthopaedic Trauma	2.512
0270-1367	Research Quarterly for Exercise and Sport	2.500
1050-6411	Journal of Electromyography and Kinesiology	2.368
1466-853X	Physical Therapy in Sport	2.365
0899-8493	Pediatric Exercise Science	2.333
1091-367X	Measurement in Physical Education and Exercise Science	2.304
1934-1482	PM&R	2.298
0091-3847	Physician and Sportsmedicine	2.241
0968-0160	Knee	2.199
1640-5544	Journal of Human Kinetics	2.193
0278-5919	Clinics in Sports Medicine	2.182
0167-9457	Human Movement Science	2.161
0894-9115	American Journal of Physical Medicine and Rehabilitation	2.159
1524-1602	Strength and Conditioning Journal	2.143

0741-1235	Sociology of Sport Journal	2.134
0268-0033	Clinical Biomechanics	2.063
1062-8592	Sports Medicine and Arthroscopy Review	1.985
1527-0297	High Altitude Medicine and Biology	1.981
1063-8652	Journal of Aging and Physical Activity	1.961
2474-8668	International Journal of Performance Analysis in Sport	1.950
2052-1847	BMC Sports Science, Medicine and Rehabilitation	1.934
1056-6716	Journal of Sport Rehabilitation	1.931
1065-8483	Journal of Applied Biomechanics	1.833
1537-890X	Current Sports Medicine Reports	1.733
0022-4707	Journal of Sports Medicine and Physical Fitness	1.637
1080-6032	Wilderness and Environmental Medicine	1.518
0888-4781	Sport Psychologist	1.453
1331-1441	Kinesiology	1.452
1087-1640	Motor Control	1.422
1577-0354	Revista international de medicina y ciencias de la actividad fisica y del deporte	1.406
1091-5397	ACSM's Health and Fitness Journal / American College of Sports Medicine	1.364
0022-2895	Journal of Motor Behavior	1.328
1754-3371	Proceedings of the Institution of Mechanical Engineers Part P: Journal of Sports Engineering and Technology	1.263
1643-8698	Archives of Budo	1.113

0932-0555	Sportverletzung-sportschaden	1.077
0940-6689	Physikalische Medizin Rehabilitationsmedizin Kurortmedizin	0.903
0765-1597	Science and Sports	0.789
0025-7826	Medicina Dello Sport	0.723
0047-0767	International Journal of Sport Psychology	0.600
1517-8692	Revista Brasileira de Medicina do Esporte	0.589
0959-3020	Isokinetics and Exercise Science	0.519
1060-1872	Operative Techniques in Sports Medicine	0.280

IMPACT FACTOR OF JOURNAL

- **Impact factor (IF)** is a measure reflecting the average number of citations to articles published in scientific journals. For example, the impact factor 2020 for a journal would be calculated as follows:

A = the number of times articles published in 2018-2019 were cited in indexed journals during 2020.

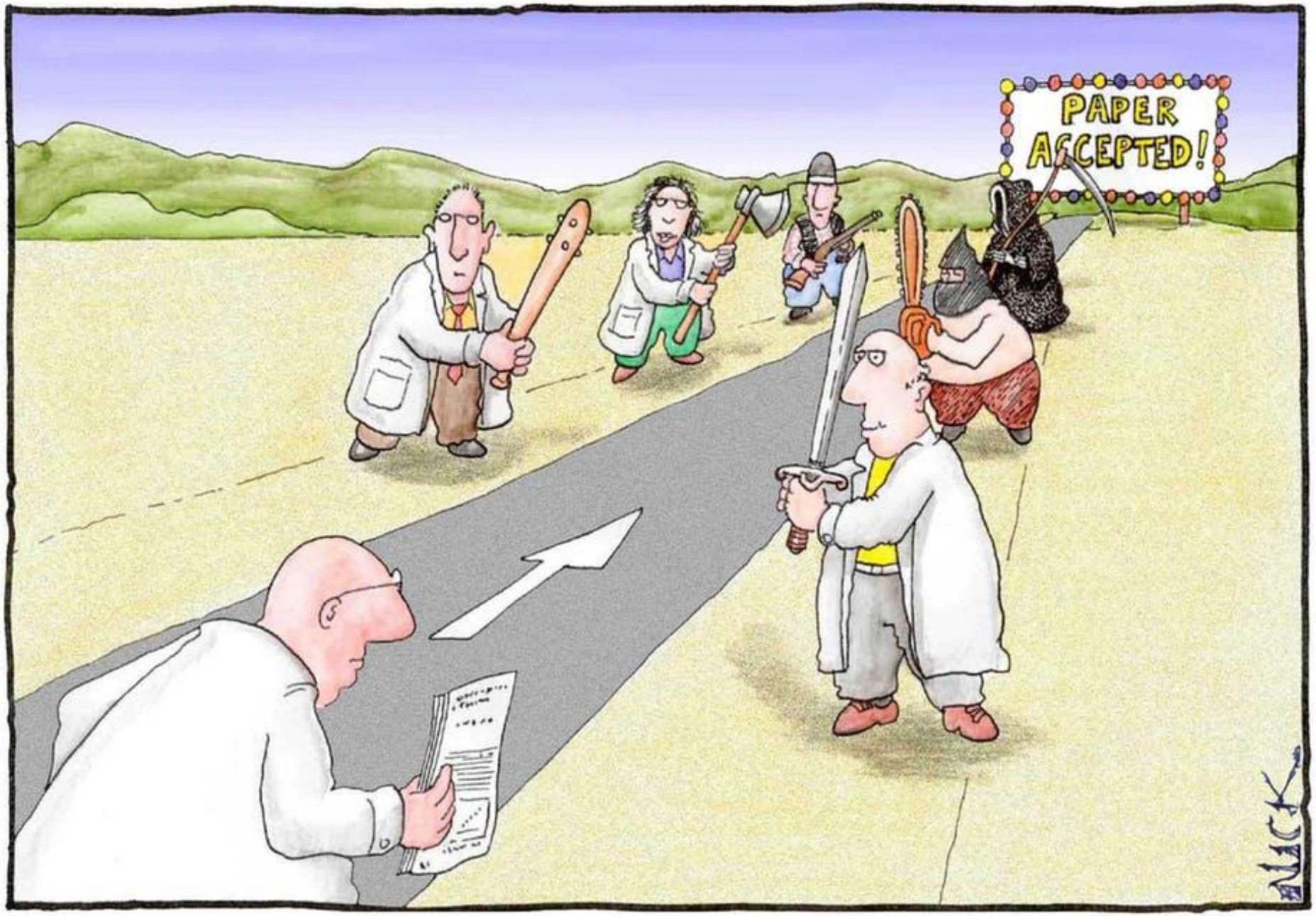
B = the number of articles, reviews, proceedings or notes published in 2018-2019.

IF 2020 = A/B

SCIENTIFIC JOURNALS

- **British Journal of Sports Medicine**
- Journal covers management of injuries and physiotherapy, physiological evaluations of sports performance, psychology, nutrition, and the role of medical personnel.

- **Impact factor 13.800**

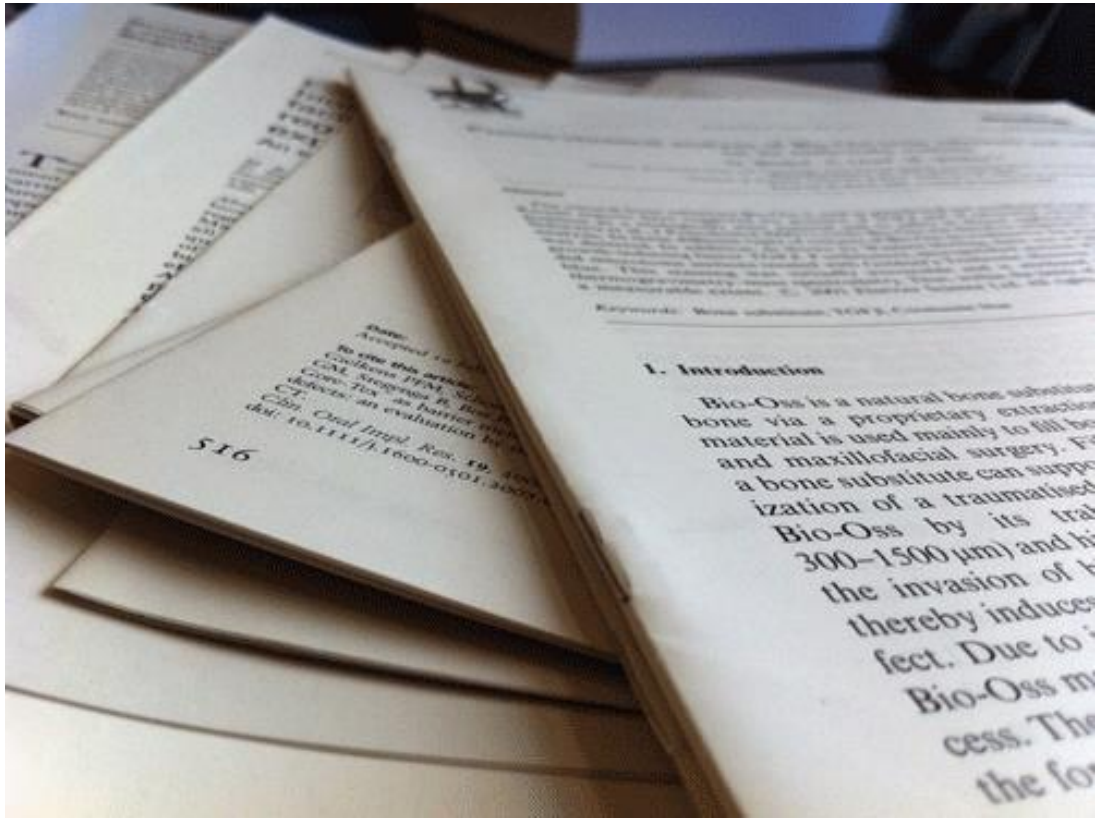


Most scientists regarded the new streamlined peer-review process as "quite an improvement."

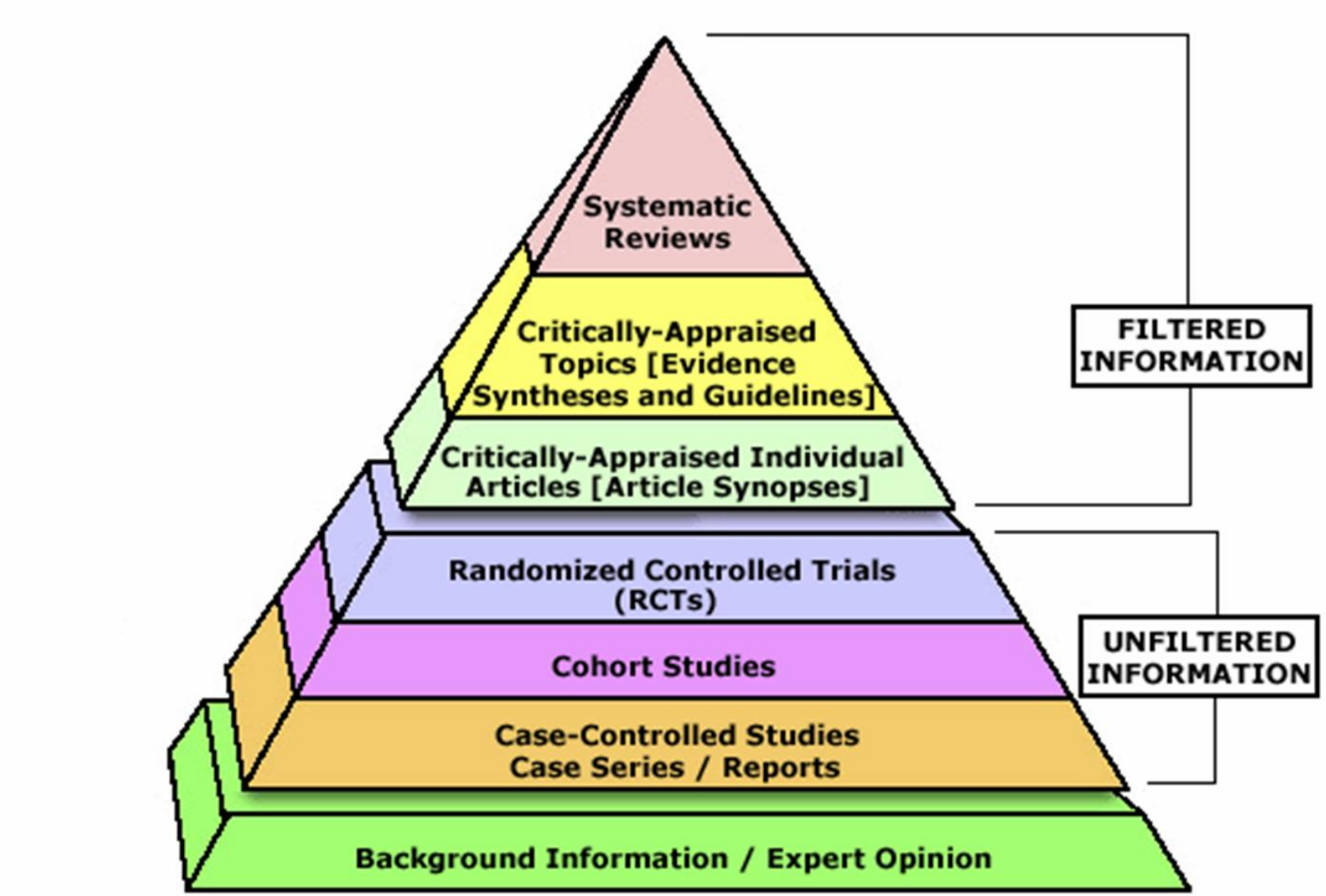
TYPES OF SCIENTIFIC AND PROFESSIONAL PAPERS

1. original scientific papers,
2. review article,
3. preliminary communications,
4. case study,
5. conference article,
6. perspective, opinion, and commentary
7. expert (professional) article

(UNESCO, 1968; in Silobrčić, 2002)



TYPES OF SCIENTIFIC AND PROFESSIONAL PAPERS



TYPES OF SCIENTIFIC PAPERS

1. ANALYTICAL RESEARCH

- Historical
- Philosophical
- Review articles

2. DESCRIPTIVE RESEARCH

- Interviews and surveys
- Epidemiological
- Normative
- Case studies
- Correlation studies

3. EXPERIMENTAL RESEARCH

4. QUALITATIVE RESEARCH

STRUCTURE OF THE SCIENTIFIC ARTICLE

- Title
- Author and institution
- Abstract
- Key words
- Introduction
- Methods
- Results
- Discussion
- Conclusion
- References

IMRAD

I – introduction

M – methods

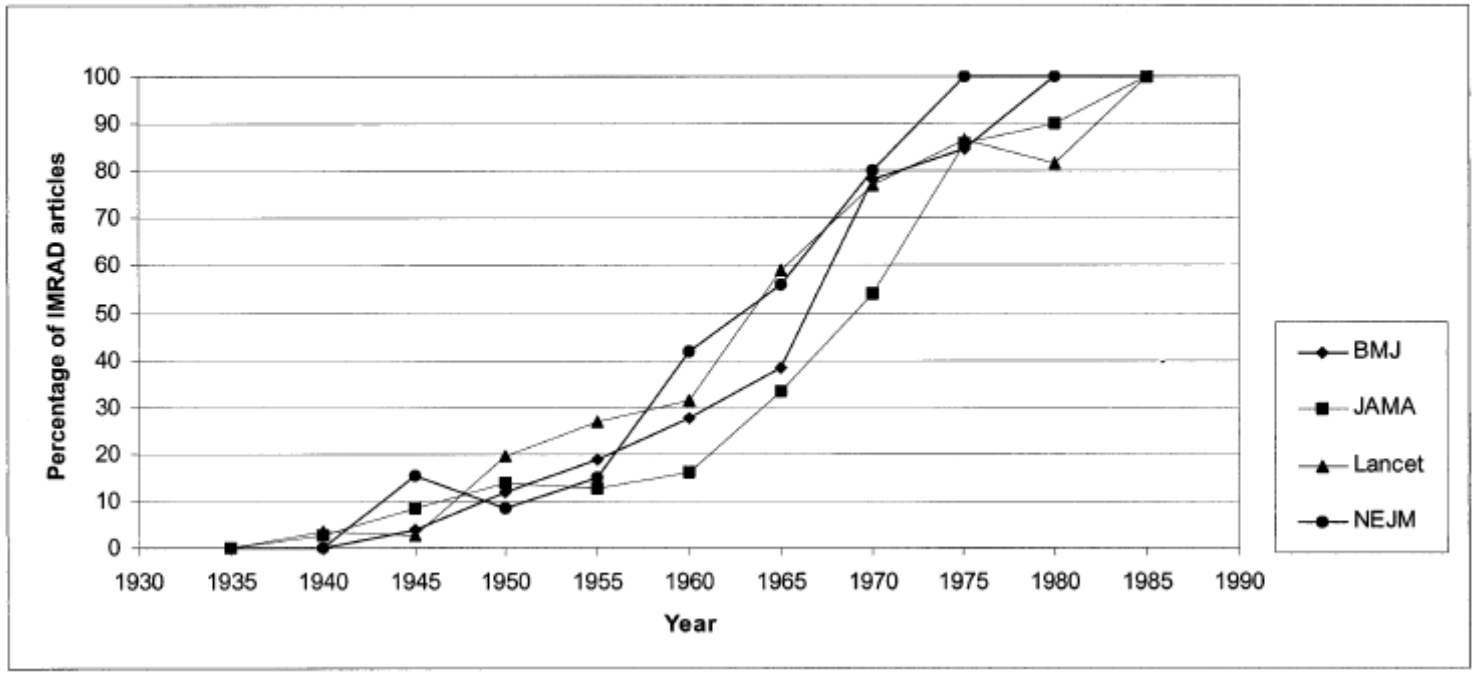
R – results

A – and

D – disscussion

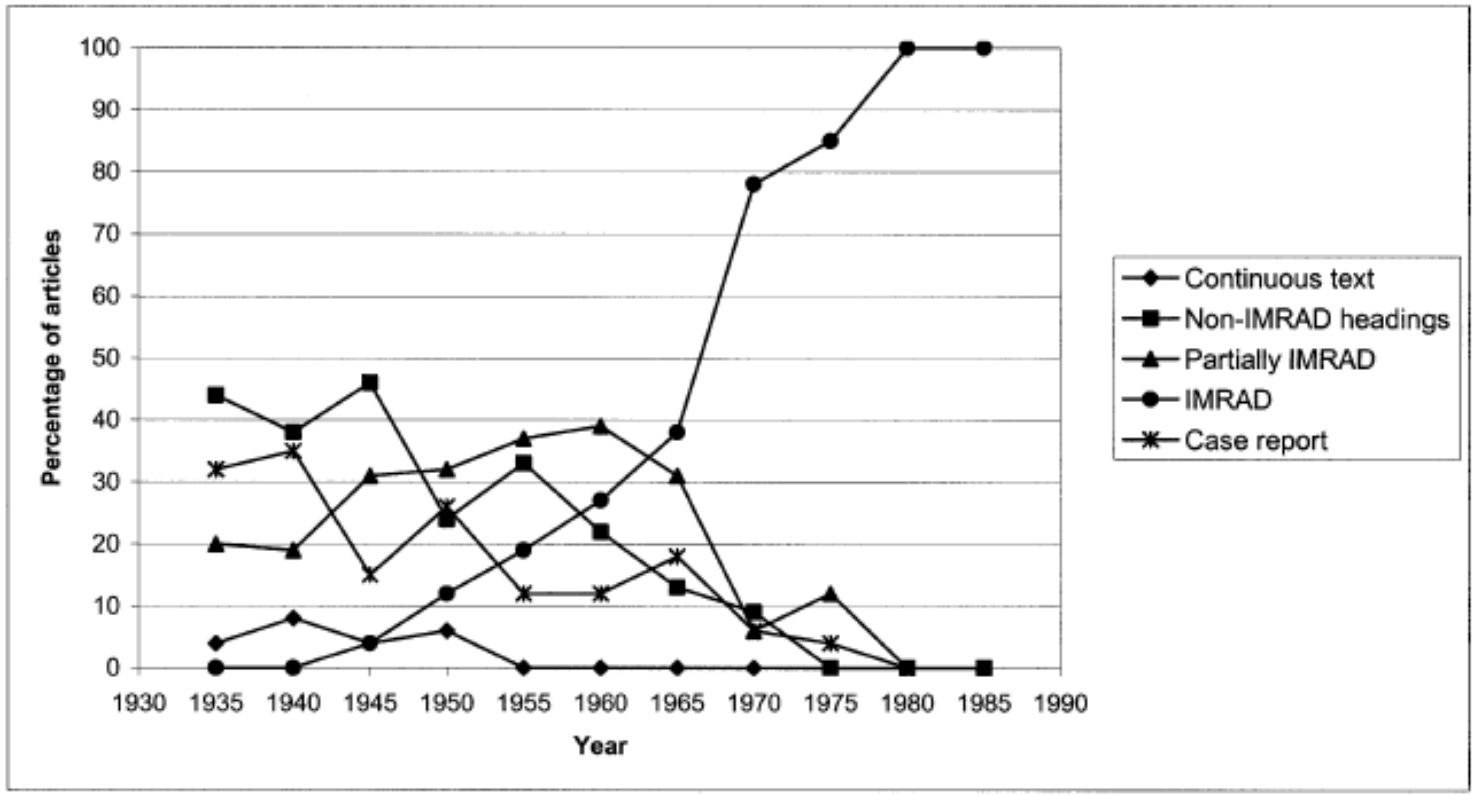
„IMRAD“ STRUCTURE

Figure 1
Proportion of introduction, methods, results, and discussion (IMRAD) adoption in articles published in the *British Medical Journal, JAMA, The Lancet,* and the *New England Journal of Medicine,* 1935–1985 (n = 1,297)



„IMRAD“ STRUCTURE

Figure 2
Text organization of published articles in the *British Medical Journal* from 1935 to 1985 (n = 341)



What is the problem?

The answer is in INTRODUCTION

What we do to collect the relevant data? How to process the data?

The answer is in METHODS

What did we find?

The answer is in RESULTS

What do these findings mean?

The answer is in DISCUSSION

SCIENTIFIC METHOD OF PROBLEM SOLVING

- Step 1: Developing the problem (defining and delimiting it)
- Step 2: Formulating the hypotheses
- Step 3: Designing methods and gathering the data
- Step 4: Analyzing and interpreting results

READING AIMED TO SOLVE ‘THE PROBLEM’

- Read textbooks
- Read ‘review papers’, specialized books, book chapters
- Read research papers

MAIN STEPS IN THE LITERATURE SEARCH

1. Write the problem statement.
2. Consult secondary sources.

Internet, Encyclopedias, textbooks, review papers

4. Read and record the literature.
5. Write the literature review.

Example #1

Searching for the Scientific Facts in Sport and Physical Education


YOUR HEALTH AND FITNESS GUI A BETTER YOU OUT!
BREAST CANCER AWARENESS ISSUE
FIT
WWW.KRAVEMAGAZINE.NET
SOUL SURVIVOR
HULON
THOMPSON
HE BEAT BREAST CANCER (YES "HE")
HOW TO GET YOUR
BEST CHEST!
MASS BLAST
SHIRT RIPPING WORKOUTS FOR BACK & BI'S
GYM SWAG 101
MASSIVE FASHION FORECAST
SCOTTY LINDSEY
LEARN THE SECRET TO GETTING HIS KILLER ABS!
PLUS:
STAYING MOTIVATED IN THE GYM
KEEPING IT TIGHT AT 40 AND BEYOND
SHAPE UP YOUR BEST ASSET... GLUTES!

the Journal of Strength and Conditioning Research™
THE OFFICIAL RESEARCH JOURNAL OF THE NATIONAL STRENGTH AND CONDITIONING ASSOCIATION
NSCA National Strength and Conditioning Association

Impact Factor 3.781

ORIGINAL RESEARCH

Abdominal Muscle Activation During Common Modifications of the Trunk Curl-up Exercise

Crommert, Martin Eriksson[1]; Bjerkefors, Anna[2,3]; Tarassova, Olga[2]; Ekblom, Maria M.[2,3]

Author Information

[1]University Health Care Research Center, Faculty of Medicine and Health, Örebro University, Örebro, Sweden;

[2]Biomechanics and Motor Control Laboratory, The Swedish School of Sport and Health Sciences, Stockholm, Sweden; and

[3]Department of Neuroscience, Karolinska Institute, Stockholm, Sweden

Address correspondence to Martin E. Crommert, martin.eriksson-crommert@regionorebrolan.se.

Journal of Strength and Conditioning Research: February 2021 - Volume 35 - Issue 2 - p 428-435
doi: 10.1519/JSC.0000000000002439

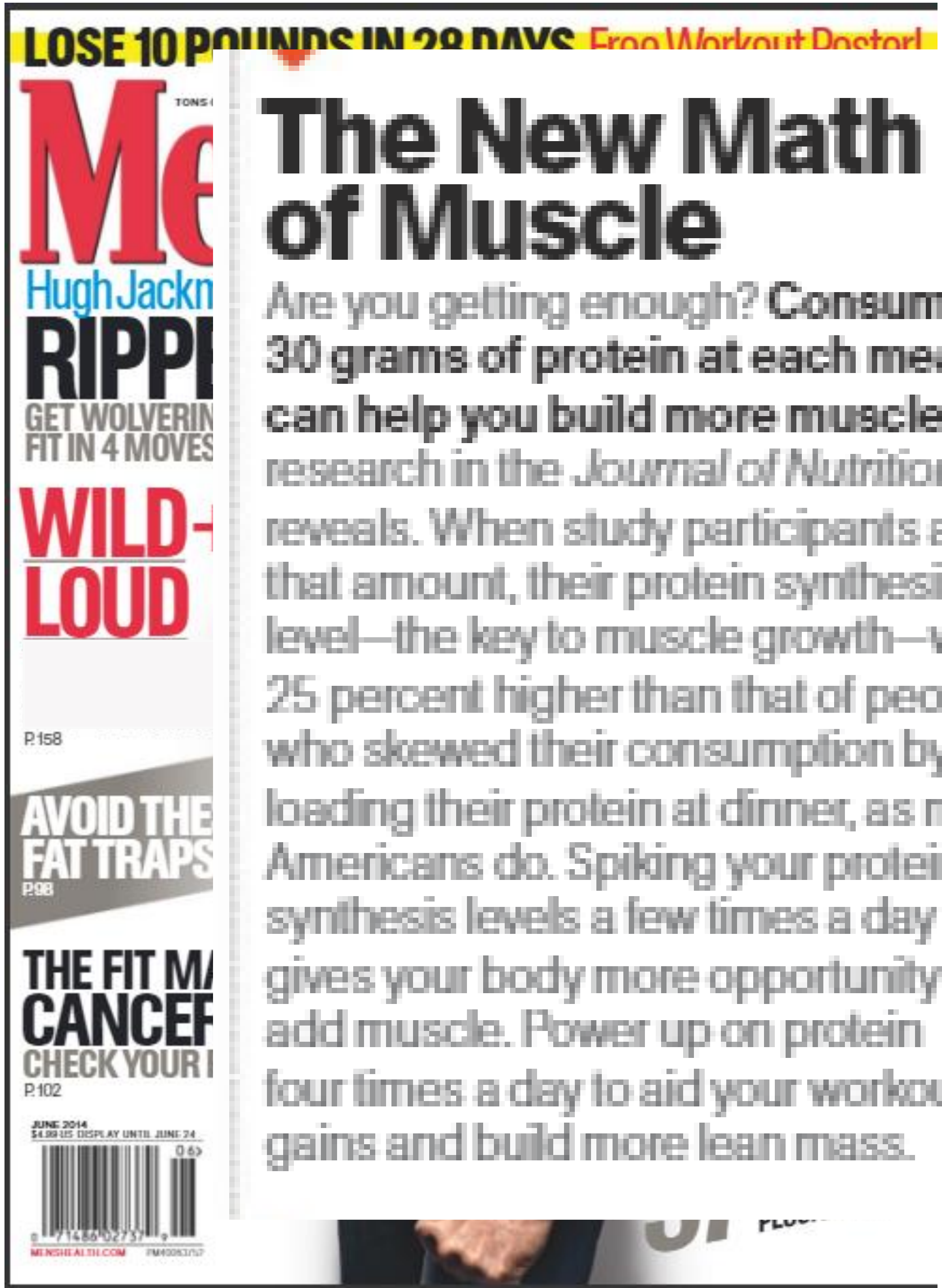
The purpose of this study was to investigate effects of common modifications of trunk curl-up exercise on the involvement of the abdominal muscles, particularly the deepest muscle layer, transversus abdominis (TrA).

Table 1 The mean normalized EMG amplitude in percent (SD) for each muscle during each phase of the straight arm (ST), cross chest (CC), behind neck (BN), left twist (LT) and right twist (RT) variations.

		STvar	CCvar	BNvar	LTvar	RTvar
	Up	13.2 (8.8)[b]	14.7 (16.9)	28.9 (19.3)[a b]	5.4 (3.9)[a]	26.3 (25.2)[b]
TrA	Static	21.1 (17.1)[c]	21.5 (21.0)[c]	40.7 (26.5)[a c]	12.7 (11.6)[a c]	34.5 (24.8)[c]
	Down	5.3 (4.8)[b c]	7.3 (7.7)[c]	14.0 (12.2)[b c]	3.6 (4.9)[c]	8.4 (8.8)[b c]
	Up	28.8 (10.0)[a b]	33.0 (11.3)[a b]	49.9 (8.8)[b]	15.2 (2.6)[a b]	44.7 (14.4)[a b]
OI	Static	43.5 (9.1)[a c]	47.1 (10.4)[a c]	61.7 (17.0)[c]	26.3 (12.9)[a c]	57.3 (12.4)[a c]
	Down	15.6 (5.9)[b c]	18.0 (3.6)[b c]	25.6 (5.5)[b c]	9.8 (6.5)[b c]	16.5 (5.7)[b c]
	Up	13.0 (6.9)[a]	17.2 (10.5)[a]	30.7 (17.3)[a]	22.3 (10.9)[a]	17.1 (16.0)
OE	Static	31.4 (17.9)[a c]	40.2 (21.9)[a c]	58.8 (22.6)[a c]	48.9 (20.6)[a c]	21.1 (12.7)[c]
	Down	16.0 (12.7)[c]	18.6 (10.9)[c]	26.1 (10.7)[c]	19.9 (10.8)[c]	13.2 (7.5)[c]
	Up	43.7 (16.7)[a b]	49.0 (15.9)[a b]	62.9 (13.9)[a b]	39.6 (13.0)[a b]	37.5 (15.6)[a b]
RA	Static	60.8 (16.2)[a c]	67.6 (15.7)[a c]	81.0 (10.9)[a c]	52.2 (13.5)[a c]	47.4 (11.4)[a c]
	Down	20.5 (6.2)[b c]	24.2 (7.5)[b c]	33.2 (9.0)[b c]	16.8 (5.2)[b c]	19.7 (7.8)[b c]

Example #2

Searching for the Scientific Facts in Sport and Physical Education



The New Math of Muscle

Are you getting enough? **Consuming 30 grams of protein at each meal can help you build more muscle,** research in the *Journal of Nutrition* reveals. When study participants ate that amount, their protein synthesis level—the key to muscle growth—was 25 percent higher than that of people who skewed their consumption by loading their protein at dinner, as most Americans do. Spiking your protein synthesis levels a few times a day gives your body more opportunity to add muscle. Power up on protein four times a day to aid your workout gains and build more lean mass.

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ORIGINAL RESEARCH

Effect of Whey *Protein* in Conjunction With a Caloric-Restricted Diet and Resistance Training

Dudgeon, Wesley D.; Kelley, Elizabeth P.; Scheett, Timothy P.

Author Information

Department of Health and Human Performance, College of Charleston, Charleston, South Carolina

Address correspondence to Wesley D. Dudgeon, dudgeon@cofc.edu.

Journal of Strength and Conditioning Research: May 2017 - Volume 31 - Issue 5 - p 1353-1361
doi: 10.1519/JSC.0000000000001196

OXFORD ACADEMIC

JN THE JOURNAL OF NUTRITION

Protein Supplementation Has Minimal Effects on Muscle Adaptations during Resistance Exercise Training in Young Men: A Double-Blind Randomized Clinical Trial

Paul T Reidy, Michael S Borack, Melissa M Markofski, Jared M Dickinson, Rachel R Deer, Syed H Husaini, Dillon K Walker, Sherry Igbinigie, Shay M Robertson, Mark B Cope, Ratna Mukherjea, Janine M Hall-Porter, Kristofer Jennings, Elena Volpi, Blake B Rasmussen

Author Notes

The Journal of Nutrition, Volume 146, Issue 9, September 2016, Pages 1660–1669,
https://doi.org/10.3945/jn.116.231803

Published: 27 July 2016 **Article history** ▾

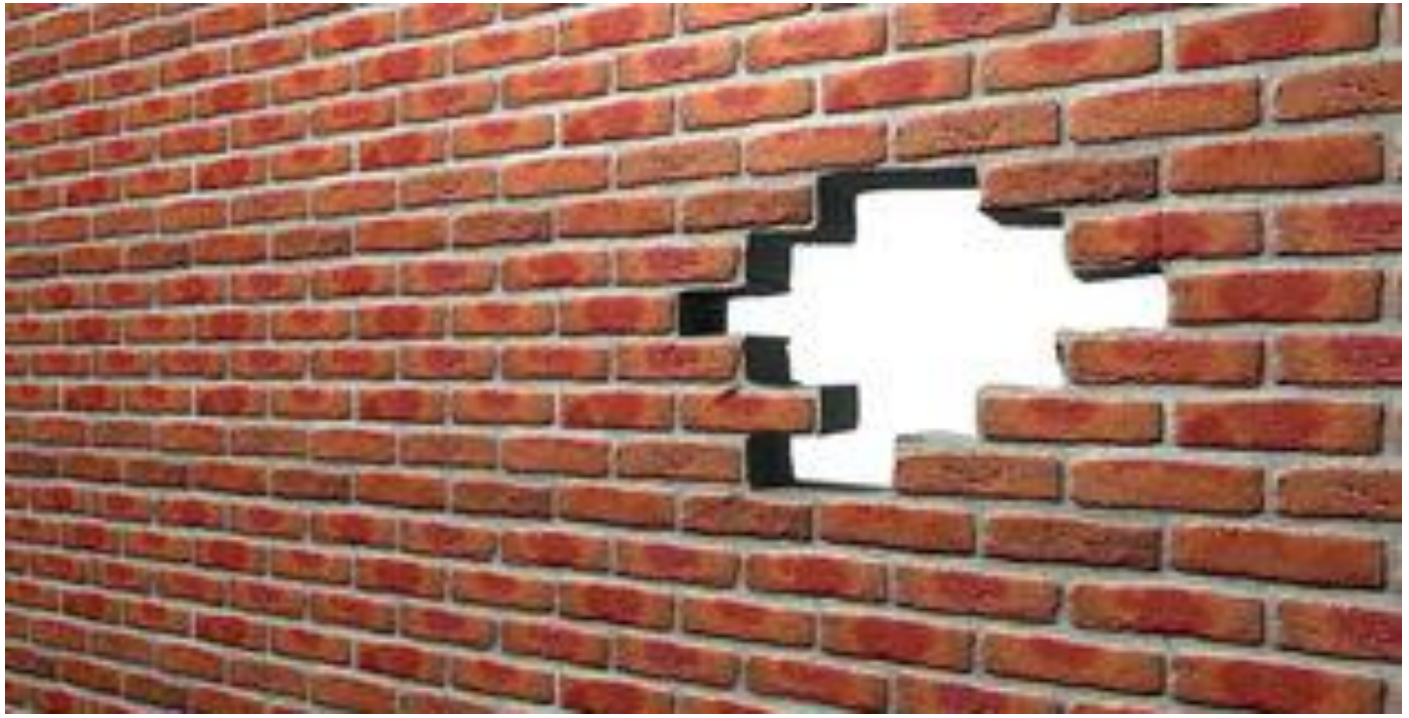
HOW TO READ RESEARCH PAPERS

Look for the main elements of the structure:

- **Introduction:** What is the problem? What is the hypothesized solution?
- **Methods**: What did they do to collect the relevant data? How did they process the data?
- **Results:** What did they find?

LITERATURE REVIEW

- Failure to carefully examine the literature for similar, prior research
- Failure to critically assess the prior literature



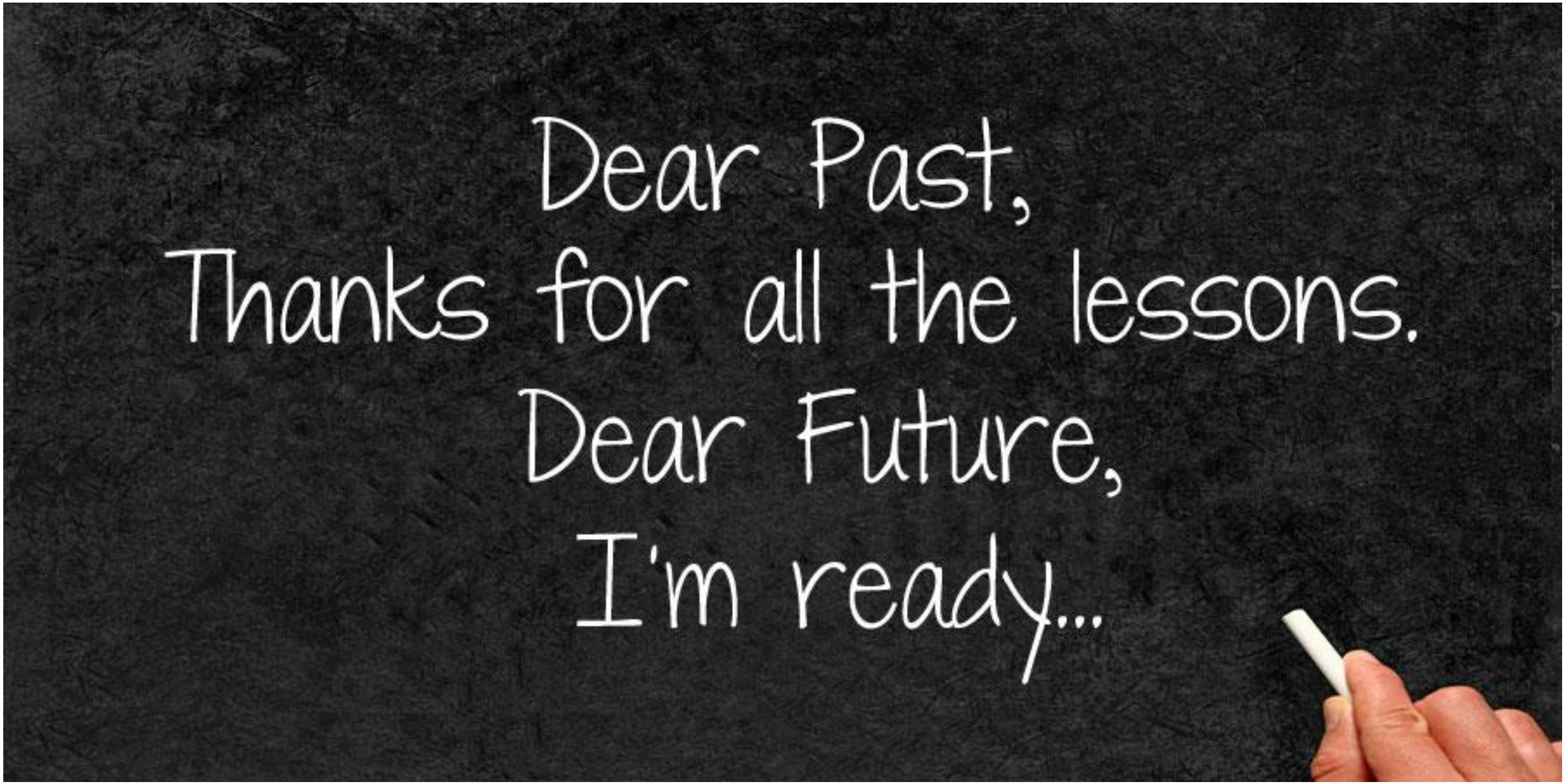
LITERATURE REVIEW

- Presenting both the good and bad points of previous researches
- It is necessary to include these critical remarks in the introductory section of the resulting final manuscript in order to justify why the study was needed and what you as a researcher did better than previous researchers

LITERATURE REVIEW - terminology

- It is important to be consistent in terminology

- Aerobic capacity
- Aerobic endurance
- Cardiorespiratory endurance
- Stamina
- Endurance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Thanks for all the lessons.
Dear Future,
I'm ready...

HOW TO CHOOSE THE TOPIC FOR RESEARCH

HOW TO CHOOSE THE TOPIC FOR RESEARCH

EXAMPLES (The Journal of Strength & Conditioning Research)

1. Range of Motion Adaptations in Powerlifters
2. Effects of a 15-Day Low Carbohydrate, High-Fat Diet in Resistance-Trained Men
3. Effects of Plyometric and Resistance Training on Muscle Strength, Explosiveness, and Neuromuscular Function in Young Adolescent Soccer Players
4. Can Caffeine Intake Improve Neuromuscular and Technical-Tactical Performance During Judo Matches?

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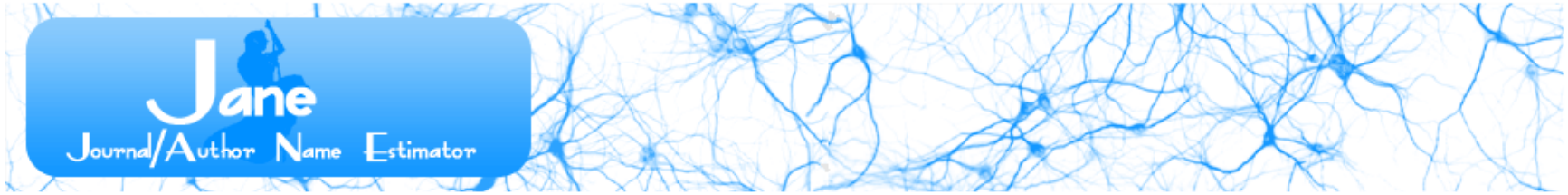

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"Clearly, scientists whose work is never cited should seriously consider doing something different with their lives."

A quotation from: Federico Rosej • Tudor Johnston
Survival Skills for Scientists (2006)
Imperial College Press [ISBN 1-86094-641-0 (pbk)]

Ask yourself the questions -
"Will other scientists be interested in my research?"
"Will my research have any impact on anything or anyone?"

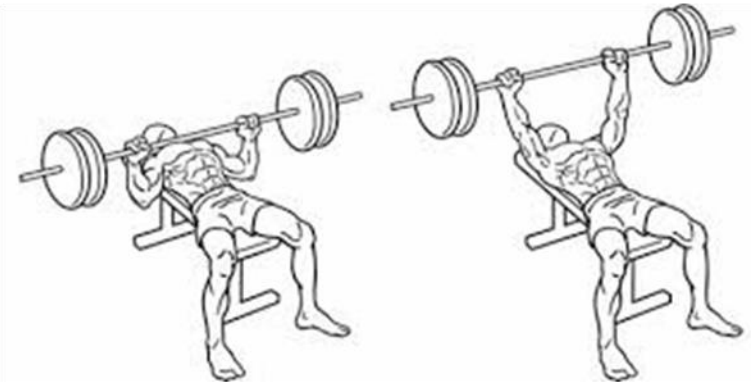
If your answers to both questions are "No", then you need to apply what you learn on this course and change your approach to doing research, …

or consider doing something different with your life!

Variable

- A variable represents a measurable attribute that varies across study units, for example, individual participants in a study, or at times even when measured in an individual person over time. Some examples of variables include age, sex, weight, height, health status, athlete/non-athlete, strength, flexibility, VO_{2max}, BMI, treated/untreated...

VARIABLES



VARIABLES

VARIABLES

- INDEPENDENT VARIABLES

- An independent variable is also called manipulative variables or predictor variables.
- An independent variable can be any feature that we will consider as a cause for some consequence.
- An independent variable can be a condition that is under our control and influence.

VARIABLES

- DEPENDENT VARIABLES

- Dependent variables are also called criterion variables.

- Dependent variables represent the result that emerged as a result of the impact of an independent variable.

VARIABLES

- CONTROL VARIABLE

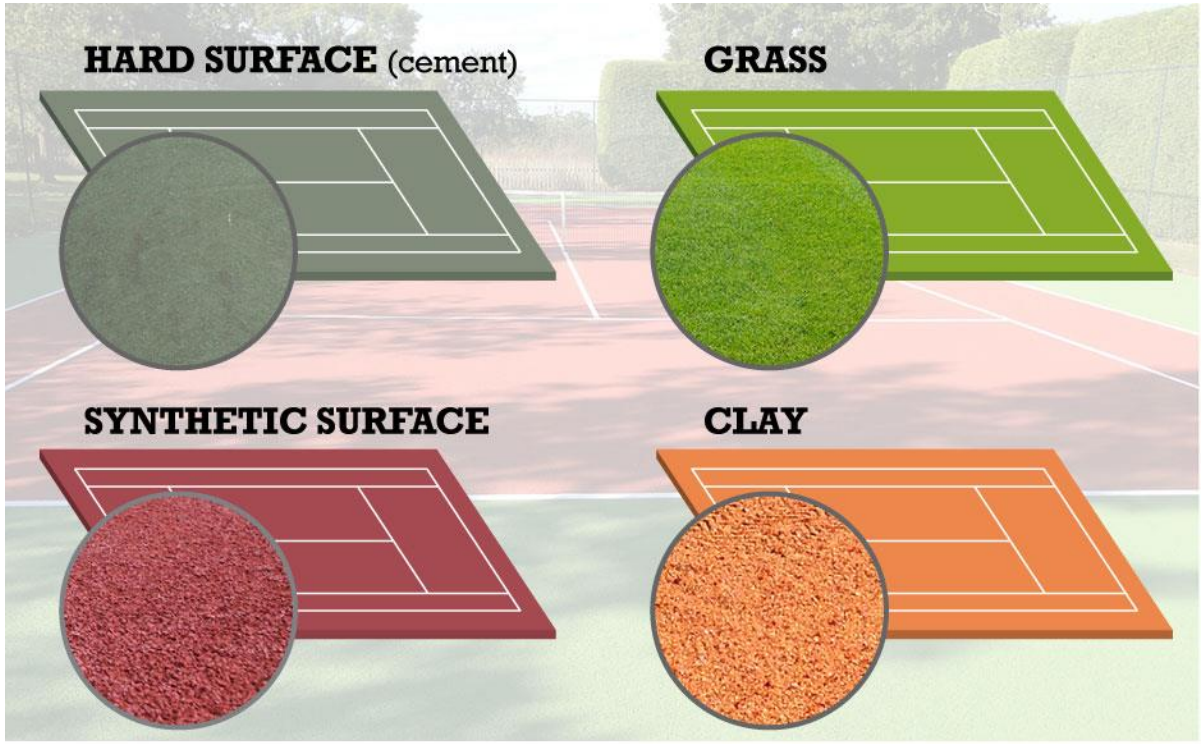
- The control variable (or scientific constant) in scientific experimentation is the experimental element which is constant and unchanged throughout the course of the investigation. The control variable strongly influences experimental results, and it is held constant during the experiment in order to test the relative relationship of the dependent and independent variables. The control variable itself is not of primary interest to the experimenter.

ASSIGNMENT FOR STUDENTS

- In the following scenario, try to identify the research variables.

ASSIGNMENT FOR STUDENTS

- Does the change of the ground material of tennis court affect the frequency and type of sports injuries?



ANSWER

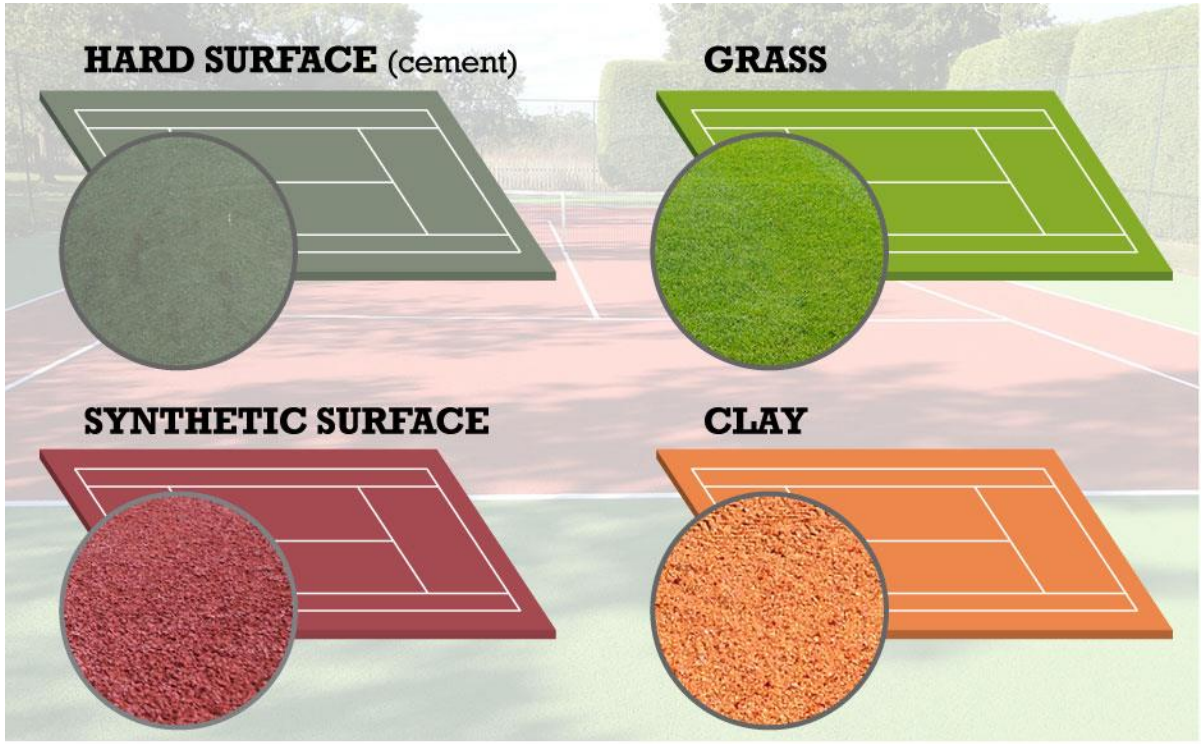
INDEPENDENT VARIABLE

- Does the change of the ground material of tennis court affect the frequency and type of sports injuries?

DEPENDENT VARIABLES

CONTROL VARIABLES

TIME OF THE DAY
AIR TEMPERATURE
HUMIDITY
DURATION OF GAME



ASSIGNMENT #2 FOR STUDENTS

- In the following scenario, try to identify the research variables.

ASSIGNMENT FOR STUDENTS

- Does the change in the temperature of the ball affect the height to which the ball will bounce off?

ANSWER

- Does the change in the TEMPERATURE OF THE BALL affect the height to which the ball will BOUNCE OFF?

CONTROL VARIABLES

- Height
- Characteristics of ball
- Characteristics of surface

BRAINSTORMING MINUTES

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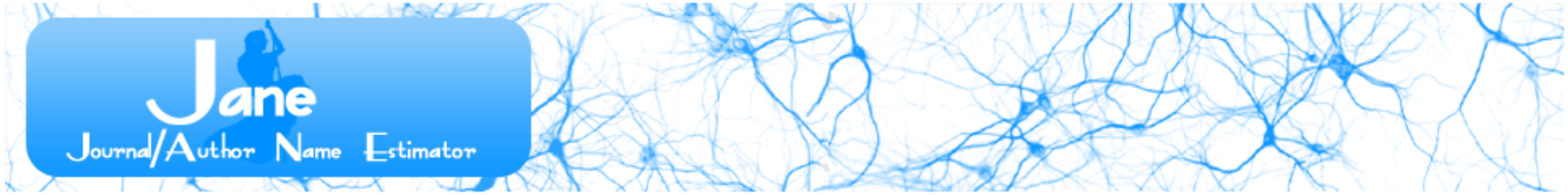

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SCIENCE for SPORT

5-10-5 Shuttle Test Scores and Performance Targets

5-10-5 Shuttle Test Scores (s)

Athlete Name	Trial 1	Trial 2	Trial 3	Best	CV (%)
1	5.25	5.34	5.34	5.25	0.80
2	5.43	5.41	5.24	5.24	1.59
3	5.7	5.52	5.57	5.52	1.36
4	5.63	5.72	5.75	5.63	0.89
5	5.45	5.39	5.39	5.39	0.52
6	5.65	5.55	5.39	5.39	1.94
7	5.16	5.34	5.35	5.16	1.65
8	5.66	5.7	5.5	5.5	1.54
9	5.07	5.26	5.16	5.07	1.50
10	5.32	5.38	5.52	5.32	1.55
11	5.41	5.41	5.46	5.41	0.43
12	5.25	5.29	5.34	5.25	0.70
13	5.16	5.26	5.23	5.16	0.80
14	5.43	5.33	5.31	5.31	0.98
15	5.14	5.35	5.23	5.14	1.64

Average	5.32	1.19
Std. Dev.	0.15	

*SWC (s)	*CV (s)	*2CV (s)
0.03	0.06	0.13

* SWC = 0.2 * Std. Dev.
*CV = Avg/100 *CV%
*2CV = CV (s) * 2

5-10-5 Shuttle Test Performance Targets (s)

Athlete Name	Best	SWC	CV	2CV
1	5.25	5.22	5.19	5.12
2	5.24	5.21	5.18	5.11
3	5.52	5.49	5.46	5.39
4	5.63	5.60	5.57	5.50
5	5.39	5.36	5.33	5.26
6	5.39	5.36	5.33	5.26
7	5.16	5.13	5.10	5.03
8	5.5	5.47	5.44	5.37
9	5.07	5.04	5.01	4.94
10	5.32	5.29	5.26	5.19
11	5.41	5.38	5.35	5.28
12	5.25	5.22	5.19	5.38
13	5.16	5.13	5.10	5.03
14	5.31	5.28	5.25	5.18
15	5.14	5.11	5.08	5.01

*SWC (s)	*CV
0.03	0.

* SWC = 0.2
*CV = Avg
*2CV = C

SWC = Trivial
CV = Possible
2CV = Certain

Thanks for Downloading | SWC Calculator

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MARTIN BUCHHEIT
Sport Scientist, Physiologist and Strength & Conditioning Coach

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Any comments?

The best of the review process in Sport Science

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The stats approach that changed my (at least scientific) life

I first had the idea of this blog when repeatedly reading Reviewers' comments about the stats used in our papers, i.e., the progressive approach based on inferences and magnitudes (http://www.sportsci.org/resource/stats/index.html). While it is impossible for me (and Alberto at least) to go backwards and use the traditional approach (based on P values), there is still still some work to do for this essential approach to be understood/accepted by the sport science community !! Have a look at the following posts, and enjoy ! Nonetheless, we will keep fighting !

Hopkins – How to Interpret Changes in an Athletic Performance Test Hopkins – Progressive statistics in sports… Batterham – Making Meaningful Inferences about magnitudes

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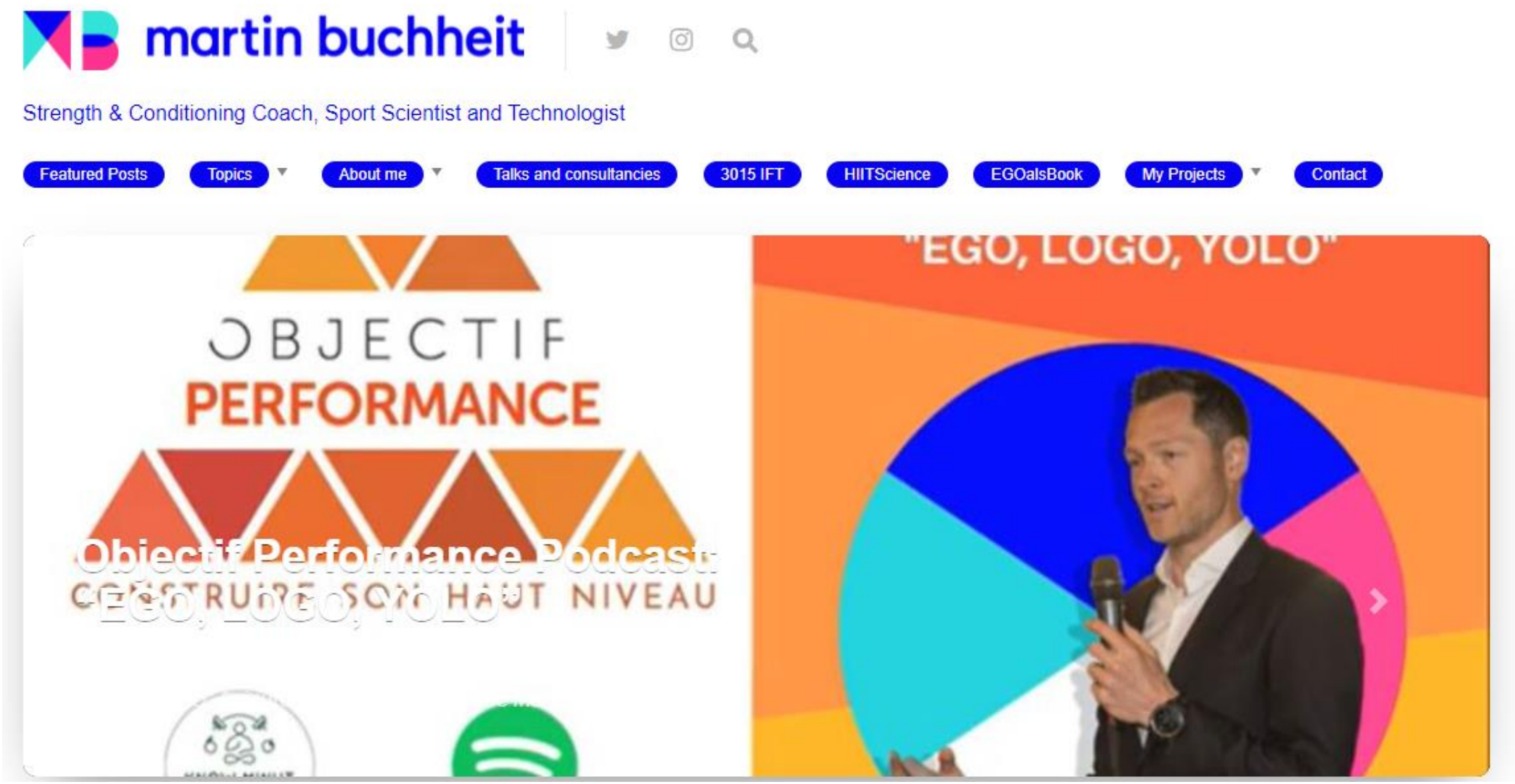

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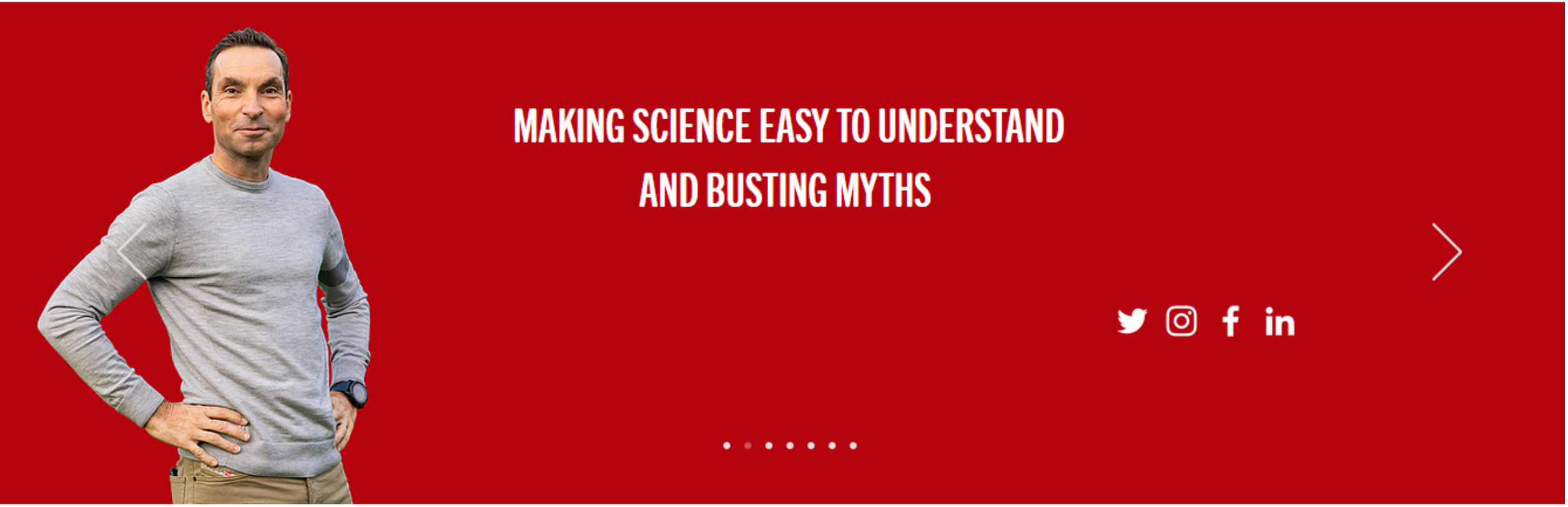

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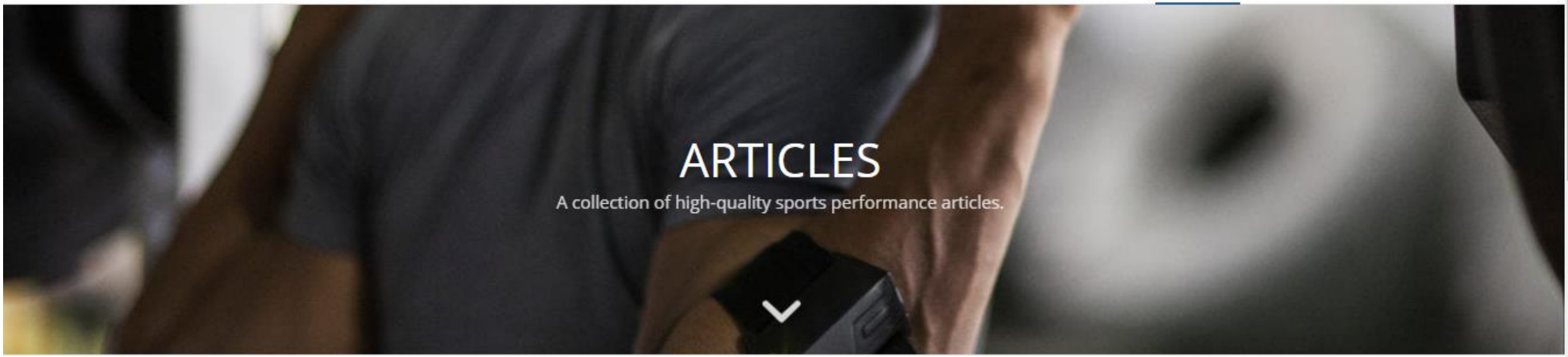

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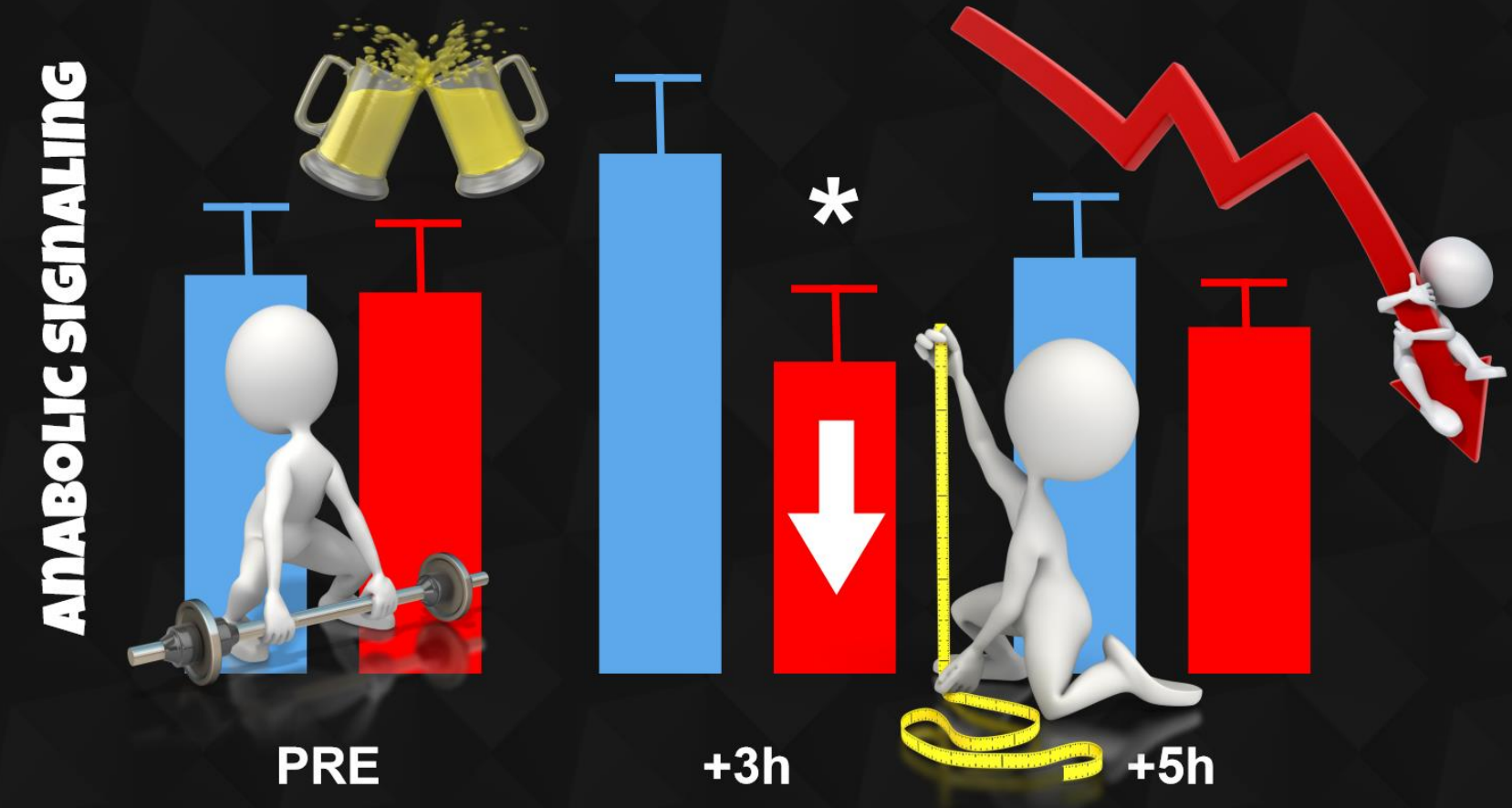
ABOUT ME

My name is Yann Le Meur. I'm a French sport scientist. I earned a Ph.D in Physiology of Exercise from the University of Nice-Sophia Antipolis in 2010 by studying the performance factors in high-level Olympic distance triathlon. My main research interests focus on performance analysis, training methodology, prevention of overreaching and recovery (~40 scientific publications). At the same time, I'm currently editorial member of different scientific journals (Sports Medicine, British Journal of Sport Medicine, Science & Medicine in Football,

Alcohol ingestion hampers the desired muscular adaptations to resistance exercise

Ten resistance trained men completed two identical acute heavy resistance exercise trials followed by ingestion of either alcohol or placebo (1.09 g of alcohol per kg of fat free body mass)



Reference: by AD Duplanty et al. JSCR, May 2016

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ORIGINAL RESEARCH

Effect of Acute Alcohol Ingestion on Resistance Exercise–Induced mTORC1 Signaling in Human Muscle

Duplanty, Anthony A.[1,2,3]; Budnar, Ronald G.[1]; Luk, Hui Y.[1,2]; Levitt, Danielle E.[1,2]; Hill, David W.[1]; McFarlin, Brian K.[1,2]; Huggett, Duane B.[2]; Vingren, Jakob L.[1,2]

Author Information

[1]Applied Physiology Laboratory, Department of Kinesiology, Health Promotion, and Recreation, University of North Texas, Denton, Texas;

[2]Department of Biological Sciences, University of North Texas, Denton, Texas; and

[3]Department of Physiology, Louisiana State University Health Sciences Center, New Orleans, Louisiana

Address correspondence to Dr. Jakob L. Vingren, Jakob.vingren@unt.edu.

Journal of Strength and Conditioning Research: January 2017 - Volume 31 - Issue 1 - p 54-61
doi: 10.1519/JSC.0000000000001468

Just lift until you can't

THE KEY TO BUILDING MUSCLE

By Robert Morton et al, Journal of Applied Physiology, 2016

49 resistance-trained men were assigned in two training groups

HEAVY LOADS

~75-90% 1RM, 8-12 repetitions/set

VS

LIGHT LOADS

~30-50% 1RM

WITH ALL SETS BEING PERFORMED TO VOLITIONAL FAILURE

RESULTS

CHANGE IN LEAN MASS

SIMILAR

CHANGE IN LEAN MASS

SIMILAR*

*only the change in bench press being higher in heavy loads group

Load DOES NOT dictate hypertrophy or, for the most part, strength gains in resistance-trained individuals

When exercises are performed to volitional failure

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Articles

Neither load nor systemic hormones determine resistance training-mediated hypertrophy or strength gains in resistance-trained young men

Robert W. Morton*, Sara Y. Oikawa*, Christopher G. Wavell, Nicole Mazara, Chris McGlory, Joe Quadrilatero, Brittany L. Baechler, Steven K. Baker, and Stuart M. Phillips Show fewer authors

CONTRALATERAL EFFECTS BY ECCENTRIC EXERCISE

Reference : Tseng et al. MSSE 2020

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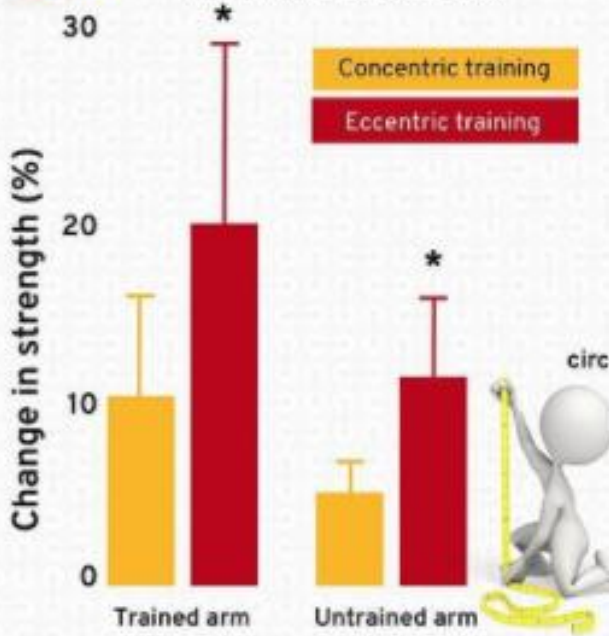
24 men were placed into 2 groups (eccentric vs concentric training of the elbow flexors). Each group completed 5 x 6 unilateral contractions, once a week for 5 wk by increasing the intensity. After the intervention, 30 maximal eccentric contractions of the opposite arm were performed 1-wk later

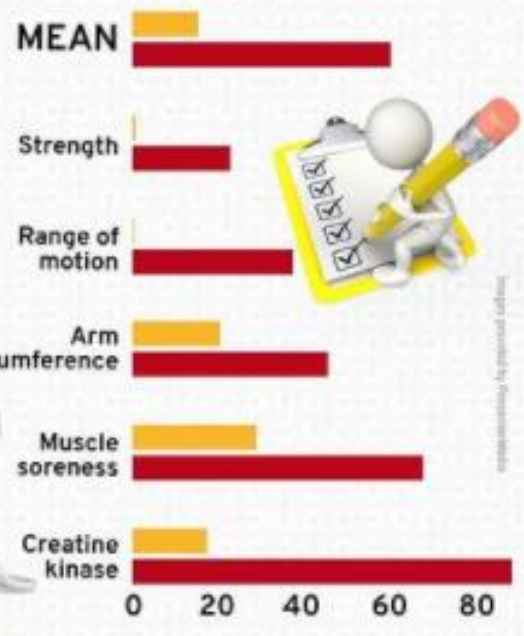
Strength

maximal voluntary isometric contraction



The progressive eccentric training produced greater increases in muscle strength not only for the trained arm but also the nontrained arm

Index of protection (%)



Progressive eccentric produced greater contralateral muscle damage protective effect

IMPLICATIONS FOR REHABILITATION

If one of the limbs is not utilized for a while and before retraining of the injured limb, a progressive eccentric training can be given to the opposite limb to minimize muscle damage when the injured muscle performs eccentric contractions

Eccentric training of a non-injured limb could potentially attenuate muscle strength loss of the injured limb better than concentric training

Contralateral Effects by Unilateral Eccentric versus Concentric Resistance Training

WEI-CHIN TSENG[1], KAZUNORI NOSAKA[2], KUO-WEI TSENG[1], TAI-YING CHOU[3], and TREVOR C. CHEN[4]

[1]Department of Exercise and Health Sciences, University of Taipei, Taipei City, TAIWAN; [2]Centre for Exercise and Sports Science Research, School of Medical and Health Sciences, Edith Cowan University, Western Australia, AUSTRALIA; [3]Department of Athletic Performance, National Taiwan Normal University, Taipei City, TAIWAN; and [4]Department of Physical Education, National Taiwan Normal University, Taipei City, TAIWAN

ABSTRACT

TSENG, W.-C., K. NOSAKA, K.-W. TSENG, T.-Y. CHOU, and T. C. CHEN. Contralateral Effects by Unilateral Eccentric versus Concentric Resistance Training. *Med. Sci. Sports Exerc.*, Vol. 52, No. 2, pp. 474–483, 2020. **Purpose:** Unilateral resistance training increases muscle strength of the contralateral homologous muscle by the cross-education effect. Muscle damage induced by second eccentric exercise bout is attenuated, even when it is performed by the contralateral limb. The present study compared the effects of unilateral eccentric training (ET) and concentric training (CT) of the elbow flexors (EF) on maximal voluntary isometric contraction (MVC) strength and muscle damage of the contralateral untrained EF. **Methods:** Young men were placed into ET, CT, ipsilateral repeated bout (IL-RB), and contralateral repeated bout (CL-RB) groups ($n = 12$ per group). The ET and CT groups performed unilateral EF training consisting of five sets of six eccentric and concentric contractions, respectively, once a week for 5 wk by increasing the intensity from 10% to 100% of MVC, followed by 30 maximal eccentric contractions (30MaxEC) of the opposite EF 1 wk later. The IL-RB group performed two bouts of 30MaxEC separated by 2 wk using the non-dominant arm, and CL-RB group performed two bouts of 30MaxEC with a different arm for each bout in 1-wk apart. **Results:** The MVC increased ($P < 0.05$) greater for the trained (19% ± 8%) and untrained (11% ± 5%) arms in ET when compared with those in CT (10% ± 6%, 5% ± 2%). The magnitude of changes in muscle damage markers was reduced by 71% ± 19% after the second than the first bout for IL-RB group, and by 48% ± 21% for CL-RB group. Eccentric training and CT attenuated the magnitude by 58% ± 25% and 13% ± 13%, respectively, and the protective effect of ET was greater ($P < 0.05$) than CL-RB, but smaller ($P < 0.05$) than IL-RB. **Conclusions:** These results showed that cross-education effect was stronger for ET than CT, and progressive ET produced greater contralateral muscle damage protective effect than a single eccentric exercise bout. **Key Words:** CROSS-EDUCATION EFFECT, RESISTANCE TRAINING, CONTRALATERAL REPEATED BOUT EFFECT, MUSCLE STRENGTH, DELAYED ONSET MUSCLE SORENESS

THE TOP 10 REASONS REPORTED FOR UPTAKE OF A SPORT IN YOUTH (177 MALES, 15-23 YEARS)

BUILD STRENGTH / MUSCLES

ENJOYMENT / FUN

FRIENDS

LIKE IT

BODY IMAGE

INTERESTED IN IT

HEALTH BENEFITS

TO TRY SOMETHING NEW

TO DEVELOP NEW SKILLS

FITNESS

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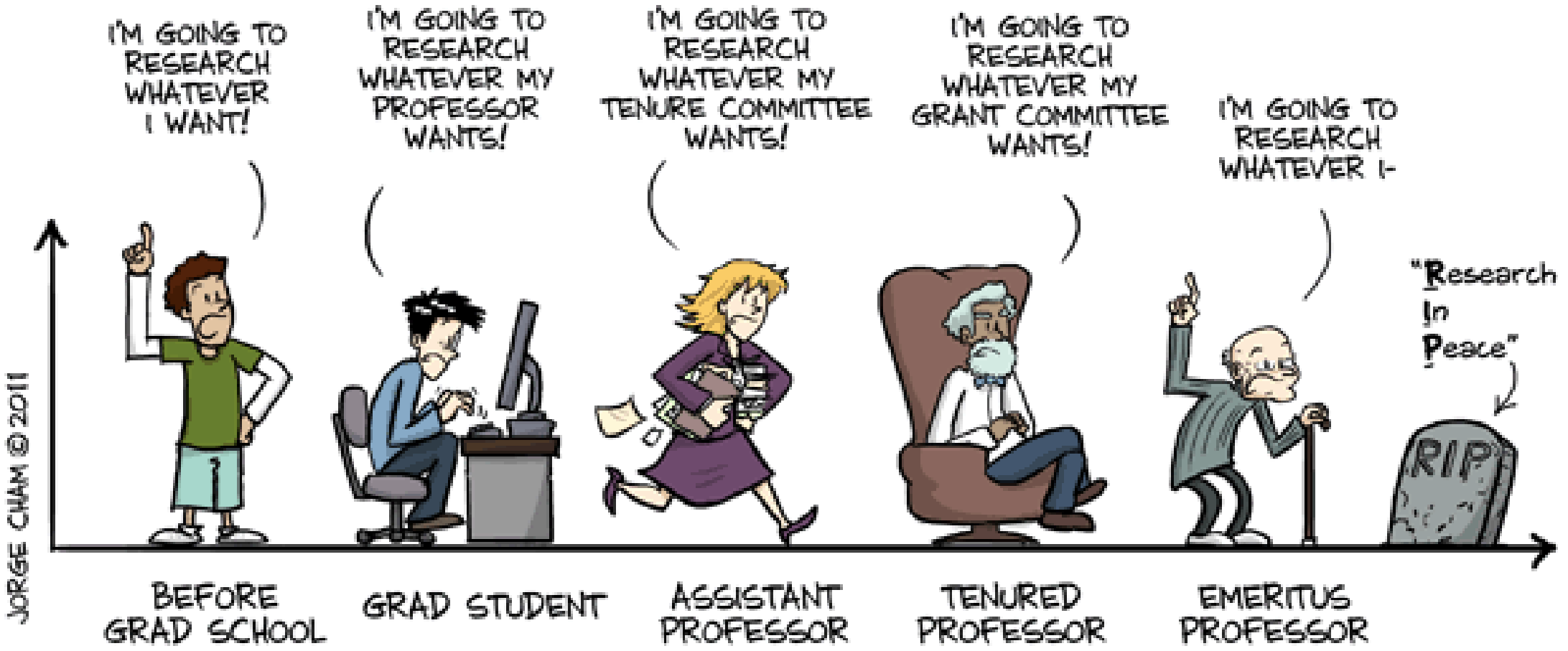
THE EVOLUTION OF INTELLECTUAL FREEDOM



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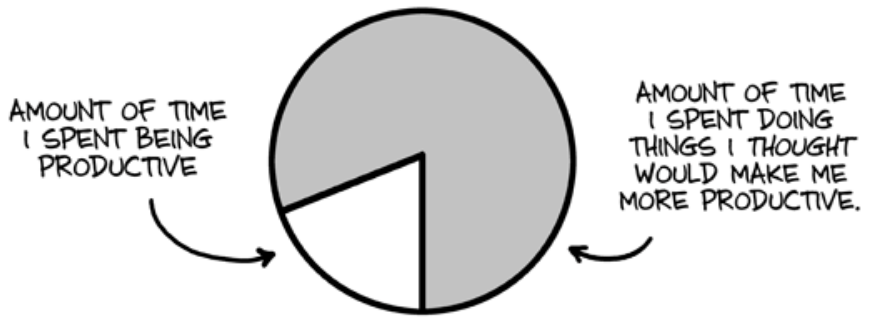

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Buddy Morris

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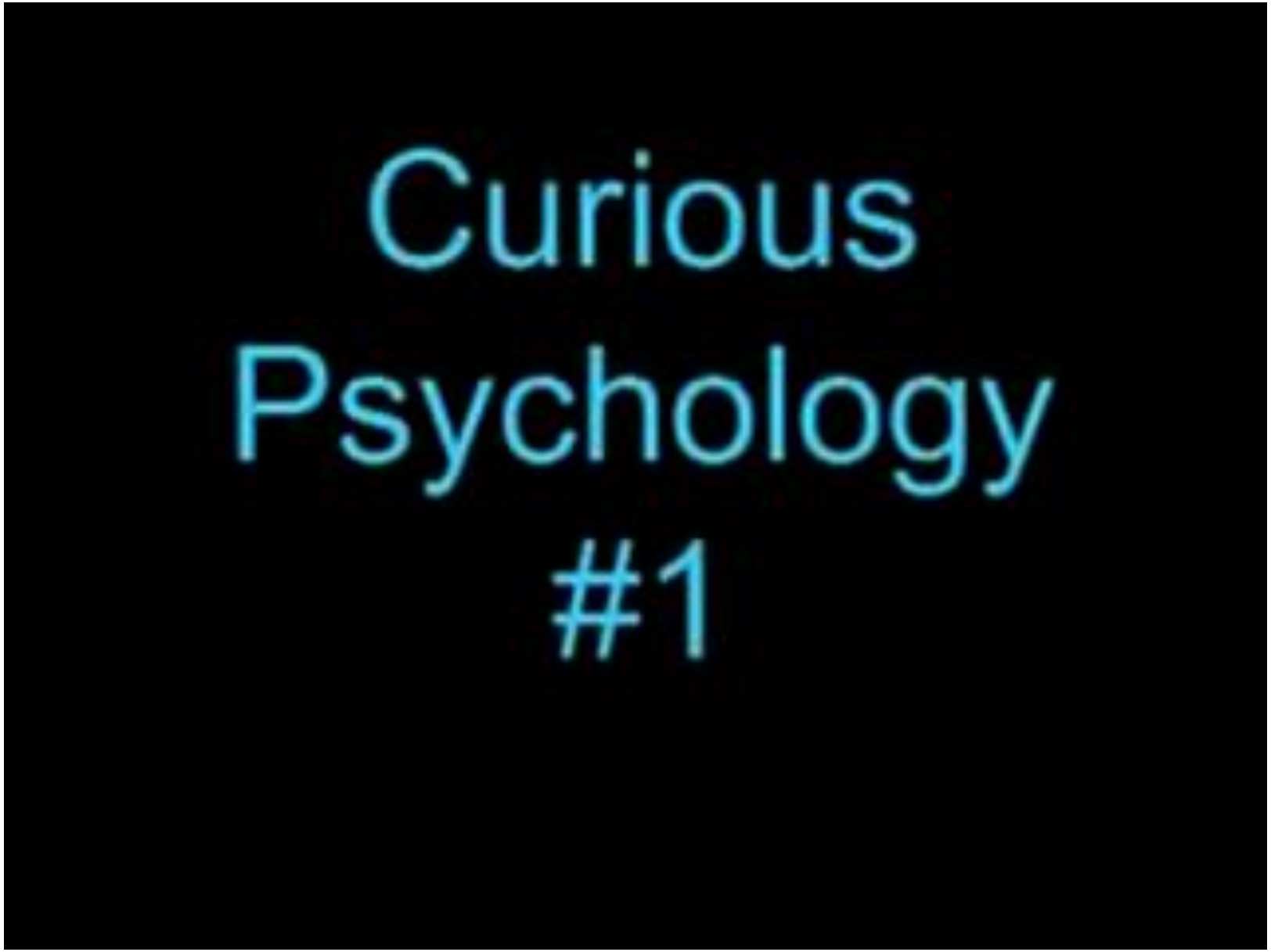
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