

THE FUTURE OF SPORT SCIENCE

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Abstract

The **purpose** of this paper is to predict the future of Sports Science (SptSci). The **method** identified 4 forces that will shape SptSci in 2040 starting with a boom in the space sector and leading to interdisciplinary collaborations between SptSci and Artificial Intelligences. The **results** are that SptSci will provide services to 7 new types of clients including Space Athletes and space-based research funders. In the **discussion** it is opined that there will be a second enlightenment and a renaissance for sport. It is **concluded** that to achieve this utopia SptSci must play its part in avoiding 2 dystopias.

Introduction

The purpose of this paper is to predict the future of SptSci up to 2040. As with most futurology ultimately it must adopt either a utopian or dystopian perspective. As it was written during a Pandemic there is a danger of a bias toward the dystopian and a risk of COVID-19 myopia. In response this paper is optimistic and hopeful because of the power of sport and science 2 of the greatest creations of humankind.

Methodology

The method used here is a futurology based on the prediction that over the next 20 years there will not be a steady, linear development in SptSci but a paradigm shift. 2040 will be very different from 2020 as compared to the difference between the years 2000 and 2020. This paradigm shift will occur because of 2 interconnected factors i) a new space race and ii) the emergence of the first generation of truly Artificial Intelligences (AI).

The credibility of the results rests on the correct identification of the forces that will shape SptSci in 2040. Figure 1 illustrates the 4 forces that it is argued will shape SptSci in 2040.

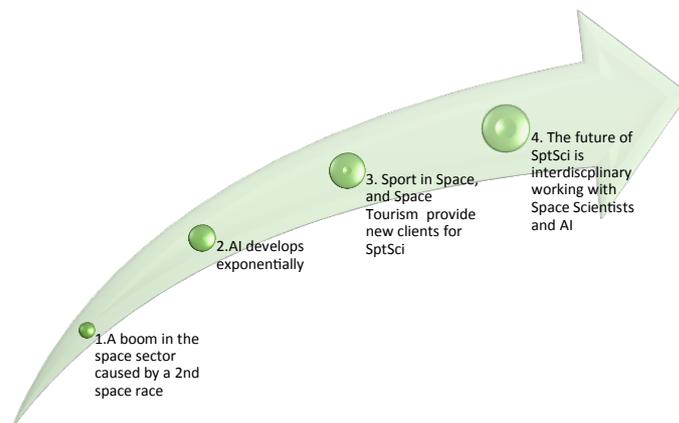


Figure 1: The Forces Shaping SptSci in 2040

These forces were identified on the bases of the following evidence.

Force 1 - A boom in the space sector: The boom in the space sector will be driven by a new Space Race. This will be animated by entrepreneurs including Sir Richard Branson (Virgin Galactic), Elon Musk (SpaceX) and Jeff Bezos (Blue Origin). Nation states will also continue to invest in space. Game changing missions in the next 20 years include;

- ✓ In 2021 the JWST mission will launch the successor to the Hubble telescope.

- ✓ In 2024 NASA's Artemis mission will put the first woman on the Moon.
- ✓ By 2030 at the earliest NASA plan to send people to Mars.

On their own these 3 missions' evidence the boom that will be experienced in the space sector by 2040. However, arguably it is as early as 2022 that the mission with the biggest paradigm busting potential will occur. ESA's ExoMars project will investigate if life has ever existed on Mars. If evidence of extra-terrestrial life is found it will revolutionise our understanding of evolution, biochemistry and the Krebs cycle resulting in major breakthroughs in all the natural sciences including exercise physiology.

F2 - AI develops exponentially: Whilst considering when superintelligent AI will arrive one of the world's leading experts Stuart Russell (2020)ⁱ stated that his timeline for their arrival '...of, say eighty years is considerably more conservative than that of the typical AI researcher. Recent surveys suggest that most active researchers expect human-level AI to arrive around the middle of the century' (p. 77). Whilst my prediction of their arrival by 2040 is therefore optimistic I justify it on 2 grounds i) the new space race will result in the investment of millions of dollars into AI and ii) this is a utopian futurology which adopts an optimistic perspective.

F3 – New Clients: With space opening up to more people for work and leisure a new group of clients for SptSci will develop. These will include Space Athletes playing and competing in space sports which the author defines as 'activities that exploit the unique features of off earth environments to enable people to play, recreate and compete to increase the sum of human and animal health and happiness'. Another important new client group will be Space Tourists whose numbers will be swelled through targeted marketing strategiesⁱⁱ.

F4 – Interdisciplinary working: There have long been calls for more interdisciplinary approaches to SptSci these have sometimes been understood in terms of more cross over between physiology, psychology and biomechanics. The force identified here is a stronger one which foresees SptSci working outside its disciplinary boundaries with Space Scientists and in a game changing development with AI.

Results and Discussion

The results are presented in Table 1.

New Clients of SptSci in 2040	Examples of New services.	Examples of New Research Questions
Space Tourists	'Fit to fly' and rehabilitation from zero gravity programmes tailored to Space Tourists.	What are the determinants of exercise adherence amongst Space Tourists?
Space Athletes	Fitness testing in zero gravity	What attributes can be used to identify talented Space Athletes?
Governing Bodies of space sports	The design of new space sports.	What characteristics of a space sport determine the level of fun experienced by participants?
Architects of space structures	The involvement of SptSci in the design of space colonies and spaceships.	What type of exercise interventions reduce the incidence of osteoporosis in off earth communities?
Space Entrepreneurs	Ideas and provocations from cutting edge research.	What is the optimum design of an Orbital Sports Stadium?
Earth based research funders	Experimentation in space on health and fitness on earth.	How can we prevent sarcopenia in older people?
Space based research funders	Experimentation in space on health and fitness in space.	What are the research priorities for a Orbital SptSci Lab?

Table 1: The Future of SptSci

The space boom and AI will lead to a new enlightenment driven by i) new insights into our cosmos created by the missions reported in the methodology and ii) the thinking and computational power of AI. A defining

characteristic of this enlightenment will be collaborations between the human mind and AI. As with all the sciences SptSci will thrive in this new culture.

Alongside the new enlightenment there will be a renaissance in sport as new sports are created in space specifically designed to ‘...increase the sum of human and animal health and happiness’. Not since the beginning of the 19th century will there have been such a codification of new sports and establishment of international federations. SptSci will be at the centre of this renaissance ensuring that these new sports are designed to meet the needs of people and animals.

Conclusion

To achieve the utopia hypothesised here SptSci must play its part in avoiding 2 dystopias. First, is a dystopian future dominated by sporadic outbreaks of COVID – 19. To prevent this future SptSci must change how it operatesⁱⁱⁱ. Second, is a dystopia created by climate change a glimpse of which we witnessed in the 2019-20 fires in Australia. To prevent this future SptSci must use its influence to educate, change behaviours and shape sustainable communities. The future of SptSci is full of scientific wonder and the passion of sport **IF** we can prevent future pandemics and reverse climate change.

References

ⁱ Russell, S. (2020). Human Compatible AI and the Problem of Control. Penguin Books.

ⁱⁱ Smith, B. (2016). Student Perceptions of Space Tourism and ways to Market the Industry to Generation Y. Unpublished UG Dissertation, University of Newcastle, UK.

ⁱⁱⁱ The BASES Position Stand on the ‘Reopening’ of Sport and Exercise Science Departments in Higher Education After Lockdown (August 2020). Available at https://www.bases.org.uk/imgs/bases_position_stand_august_202079.pdf