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A Scientometric Portrait of Daniel Funk: Publication Productivity, Collaboration Patterns, and Citation Analysis

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Abstract

Purpose: Scientometrics summarise and analyse the work of eminent researchers. In this paper, we analyse and to some extent celebrate, the influence of Dan Funk on sport marketing and sport consumer behaviour scholarship.

Design/methodology/approach: We summarise 1) the scientific indicators of his contribution; 2) research themes; 3) co-authorship patterns (i.e. key collaborators, country, university affiliation, author group size) 4) journals that have pubished his research; 5) his ideational influencers and influencees. His articles were retrieved from the Web of Science (Core collection) and analysed using HistCite, Publish or Perish and VOSviewer software.

Findings: The scientometric portrait depicts a 20-year publishing career, the pursuit of complementary research themes, a large number of co-authors and a relatively small number of high-value collaborators, and a willingness to pursue opportunities at different universities (and countries), a process which inevitably expands a researcher's network

Originality/value: This is the first scientometric portrait of sport marketing and consumer behaviour. The emergence of highly prolific authors is a sign that the related academic fields of sport management, sport marketing and sport consumer behaviour are maturing.

Keywords: Scientometric, sport management, bio-bibliometric;

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A bibliometric study is an effective method to evaluate outstanding researchers within a scientific field. Such studies are known as either bio-bibliometric, or our preferred term, scientometric portraits (Koley & Sen, 2017). Nalimov and Mul′chenko first defined scientometrics as "the quantitative methods of the research on the development of science as an informational process" (Nalimov & Mul′chenko, 1971, p. 2). Scientometrics is "centrally, but not only, concerned with the analysis of citations in the academic literature" (Mingers & Leydesdorff, 2015, p. 1).

Scientometric portraits are somewhat rare in the academic literature, but are available for leading scholars in a variety of academic disciplines including philosophy (Chaparro-Domínguez, & Repiso, 2020), agricultural science (Garg & Kumar, 2019), organic chemistry (Yasmin & Valli, 2019), genetics (Kumar, Kumar, & Ruhela, 2018; Kumar, Ruhela, & Kumar, 2018), economics (Sinha, 2017), bibliometrics (Koley & Sen, 2016; Jacso, 2018), and biochemistry (González-Alcaide, 2014). There are no known scientometric portraits of scholar in the related fields of sport management, sport marketing, and sport consumer behaviour.

In this study we provide a scientometric portrait of Daniel Funk, a prolific sport marketing and sport consumer behaviour researcher. Funk is currently employed as a professor and Washburn Senior Research Fellow for the School of Tourism and Hospitality Management at Temple University. He also holds a joint appointment in the Fox School of Business (Fox School of Business, 2020). Funk received his bachelor's degree in communications from the University of Kansas in May 1987, later obtaining masters (1998) and doctoral degrees (1998) in sports management from Ohio State University. Prior to starting at Temple University in 2011, he

worked at the University of Louisville (1998-2000), University of Texas at Austin (2000-2004) and at Griffith University (Australia) (2002-2011). Funk has received a number of awards and honors. In 2007, he was admitted as a Research Fellow of North American Society for Sport Management (NASSM). In 20113, he was awarded the Sports Marketing Association Researcher Award. In 2018, NASSM awarded Funk the Earle F. Zeigler Award, an award which reflects "significant contributions to the field in terms of scholarship, research, leadership, and peer recognition".

The overarching aim of the study is to evaluate the Funk's contribution to the field of consumer behaviour. More specifically we will summarise 1) the scientific indicators of his contribution; 2) research themes; 3) co-authorship patterns (i.e. key collaborators, country, university affiliation, author group size) 4) journals that have pubished his research; 5) his ideational influencers and influencees.

In the following section we will outline our methods. This is followed by an integrated results and discussion section.

Methods

This study is based on the published work of Dan Funk. His articles were retrieved from the Web of Science (Core collection), and more specifically the Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI), Conference Proceedings Citation Index- Science (CPCI-S), Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH). The search terms were 'AI=L-4302-2018 OR AU=Funk, Daniel C'. Consequently, 86 documents were identified, starting in 2001 and the most recent a 2020 publication. The bibliographic data – article title, year of publication, journal name, co-authors, co-author university, Funk university, university country - were

subsequently analysed by three different programs. HistCite software generated the visualization of highly cited published articles, and subsequently to map the citations to indicate their impact on future research (Garfield, 2009). Publish or Perish (Harzing, 2007) and VOSviewer software (van Eck & Waltman, 2010) was used to construct and visualise the bibliometric networks.

Findings and Discussion

In this section we present and discuss our findings in four sub-sections – scientific indicators, co-authorship patterns, journals and individual ideational influencers and recipients.

Scientific Indicators

Table 1 summarises Funks contributions across 11 scientific indicators. Total Publications refers to the nunber of articles authored or co-autored by Funk. The Total Global Citation Score (TGCS) is the total number of citations to all Funk papers. The Average Citations per Item and and cites per year are self explanatory. Cites Author refers to sum of the average number of citations per author. Sum of Times Cited refers to the total number of articles that have cited Funk's work. Citing Articles refers to the total number of citing articles. Citing articles without self citations excludes those citing articles authored or co-authored by Funk. A scientist has H-index of h if his or her N papers have at least h citations each, and the other (N-h) papers have no more than h citations each. While the h-index is independent of an academic's career length, the m-quotient incorprates the period of academic endeavour. Thus, if n=number of years since the first published paper of the scientist, the m-quotient=h-index/n. The g-index, a variant of the h-index, incorporates the citation evolution of the most cited papers over time. A set of papers has a g-index of g if g is the highest rank such that the top g papers have, together, at least g^2 citations.

Table 1.Funk: Scientific Indicators

Scientific Indicator	Value
Total Publications	86
Total Global Citation Scores	2286
Average Citations per Item	26.99
Cites per Year	120.32
Cites Author	814.21
Sum of Times Cited	2294
Citing Articles	1456
Citing Articles - Without Self Citations	1490
H-Index	27
G-Index	45
M-Index	1.35

Figure 1 provides a temporal assessment Funk's research outputs. Funk published his first article at the age of 37. His productivity was at its highest between the ages of 47 to 51 years. Approximately 41% of his articles were pubished during this time. Calcuating TGCS based on five-year periods starting with his first publication, his citations improved across the first three periods, but have declined in the fourth period (2016-2020).

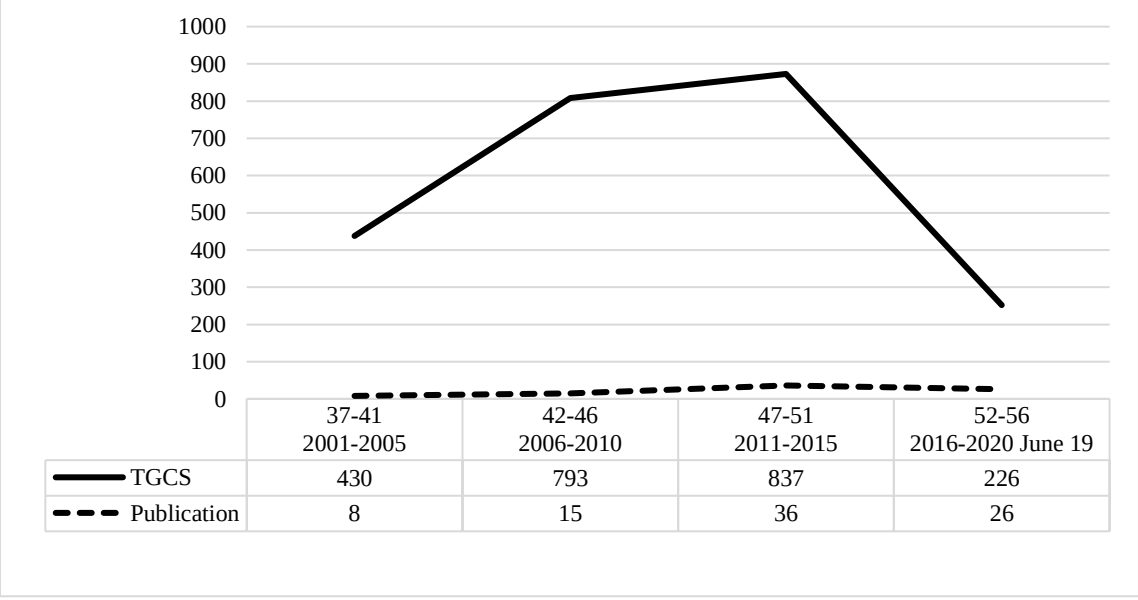

Figure 1. *Funk: Publications and Citations*

Table 2 provides a list of Funk's ten most cited articles. Each of these articles have received more than 60 citations and were published between 2002 and 2012. These ten articles account for 1107 of the 2286 citations, or approximately 48% of his TGCS. Five of the ten articles were published in the Journal of Sport Management. Funk was first author for five of the articles.

Table 2. *Funk: Articles with Ten Highest TGCS*

Article Title	Year	Journal	First Author	TGCS
Consumer loyalty: The meaning of attachment in the development of sport team allegiance	2006	Journal of Sport Management	Funk	228
Developing an understanding of brand associations in team sport: Empirical evidence from consumers of professional sport	2002	Journal of Sport Management	Gladden	177
Exploring origins of involvement: Understanding the relationship between consumer motives and involvement with professional sport teams	2004	Leisure Sciences	Funk	129
The role of socio-psychological and culture-education motives in marketing international sport tourism: A cross-cultural perspective	2007	Tourism Management	Funk	98
Sport involvement: A conceptual and empirical analysis	2011	Sport Management Review	Beaton	84
Capacity of mass participant sport events for the development of activity commitment and future exercise intention	2011	Leisure Sciences	Funk	69
Impact of prior exercise on hamstring flexibility: A comparison of proprioceptive neuromuscular facilitation and static stretching	2003	Journal of Strength and Conditioning Research	Funk	68
It's really not about the bike: Exploring attraction and attachment to the events of the Lance Armstrong Foundation	2008	Journal of Sport Management	Filo	67

Recurring sport events and destination image perceptions: Impact on active sport tourist behavioral intentions and place attachment	2012	Journal of Sport Management	Kaplanidou	63
The meaning behind attachment: Exploring camaraderie, cause, and competency at a charity sport event	2009	Journal of Sport Management	Filo	62

Research Themes

To identify Funk's key research themes, Figure 2 below displays a word cloud of keywords. In this word cloud, the most frequently used words are displayed in larger font. Consumer behavior, team identification, brand association, sport events, physically active leisure, loyalty, brand, involvement and sport fan are the most prominent keywords.

Figure 2. *Funk – Keyword Word Cloud*

Figure 3 provides a more nuanced summary of the keywords used in Funk's articles. The keywords are coded in five colours: red (i.e. high density), orange, yellow, green and blue (i.e. low density). Closely related keywords are in close proximity whereas less-related keywords are further apart. Therefore, sporting events, sport fans, involvement, motivation, physically active leisure, sport consumers, marketing, consumer behavior, e-sport, are the central research themes pursued by Funk.

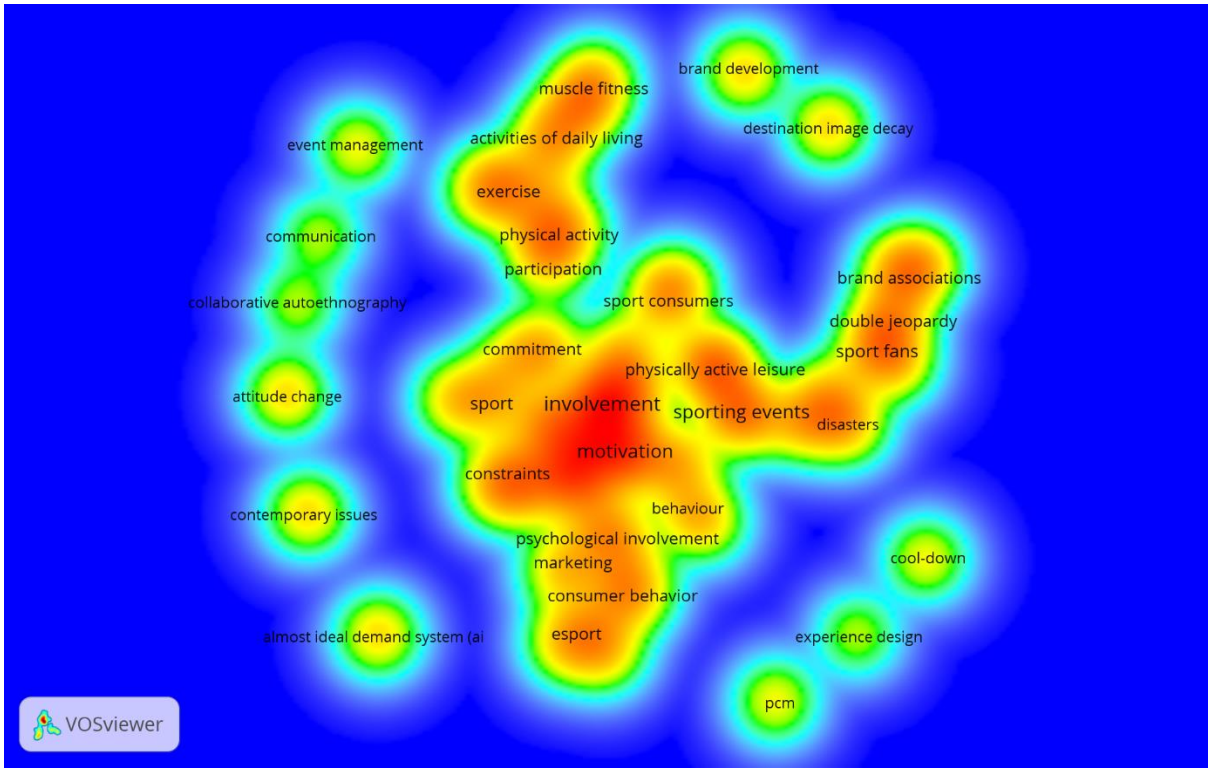

Figure 3. *Funk – Keyword Density Citation Map*

Co-Authorship Patterns

In this subsection we examine Funk's co-authorship patterns. More specifically, we identify key co-authors, co-author country, co-author university affiliation, author group size.

Key co-authors. Table 3 indicates that Jeremy Jordan (n= 23), Kevin Filo (n=11), and Mikihiro Sato (n=10) are Funk's most frequent collaborators. The Funk-Jordan publishing partnership started in 2011, whereas collaborations with with Filo (2008-2017) and Sato (2014-2020) started later. His 48 collaborations with either Jordan, Filo, Alexandris, and Ridinger account for 1,290 citations, or just over half of his TGCS.

Table 3. *Funk: Most Frequent Collaborators*

Author	**Collaborations**		**University**	**H-index**	**TGCS**	
	n	%			n	**%**
Jordan	23	26.7	Temple	20	402	17.58
Filo	11	12.8	Griffith	13	283	12.37
Sato	10	11.6	James Madison	6	86	3.76
Pritchard	9	10.5	Central Washington	22	191	8.35
Alexandris	8	9.3	Aristotle	12	242	10.58
Doyle	8	9.3	Griffith	13	143	6.25
McDonald	8	9.3	RMIT	13	138	6.03
Swank	7	8.1	Louisville	19	151	6.60
Lock	7	8.1	Bournemouth	12	144	6.29
Du	7	8.1	Florida State	5	48	2.09
Kunkel	7	8.1	Temple	9	110	4.81
Inoue	7	8.1	Manchester Met.	11	66	2.88
Ridinger	6	7.0	Old Dominion	7	363	15.87
King	6	7.0	Temple	22	130	5.68
Baker	6	7.0	Massachusetts	4	53	2.31

Figure 4 shows Funk's co-author network. In this network, the nodes represent the researchers and links among the nodes represent scientific collaborations (i.e. co-authorships). The size of the nodes indicates the number of publications, and the thickness of the link reflects the the multiplicity of collaborations. In the network, Jeremy Jordan, Kevin Filo and Mikihiro Sato are the most prominent. The Funk-Jordan collaborative window (2011-2019) is similar in length to the windows for Funk-Filo (2008-2017) and Funk-Sato (2014-2020).

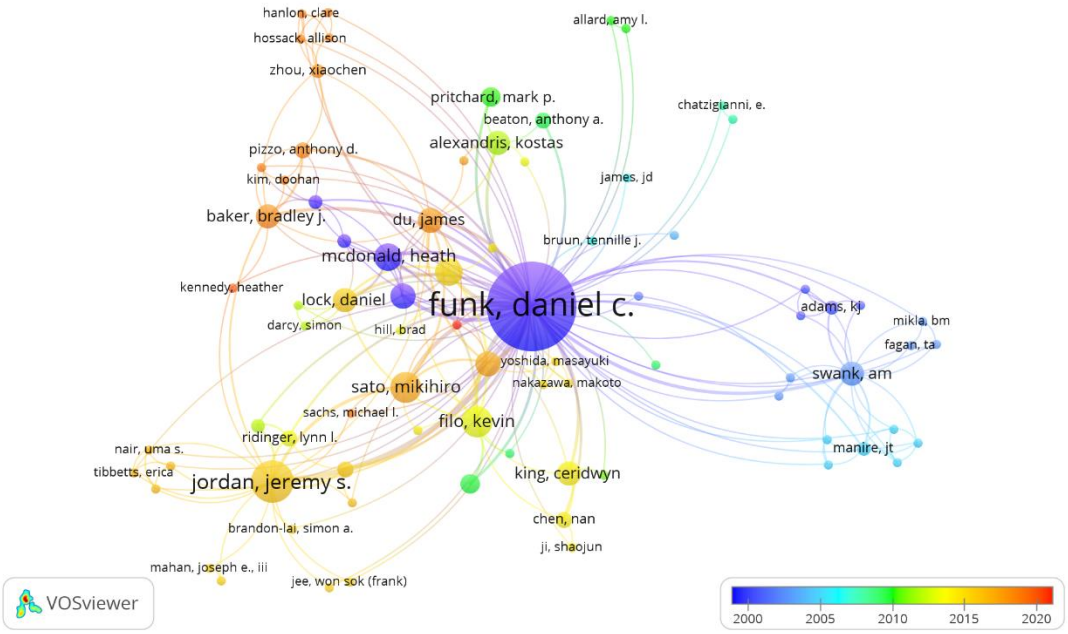

Figure 4. *Funk: Co-author Network*

Country of collaboration. Funk has an international network of collaborators. Funk has collaborated with 80 researchers from seven countries. US colleagues are the most prominent (n=77), ahead of Australia (n=47), Greece (n=5), the United Kingdom (n=6), South Korea (n=3), Japan (n=1), and China (n=1). Funk's frequent collaboration with Australia and the United States reflects his employment at US and Australian universities. Unsurprisingly, articles published with Australian and United States colleagues account for 46% and 44% of his TGCS respectively. This network is summarised in Table 4 and Figure 5.

Table 4. *Funk: Research Collaborators and TGCS by Country of Collaborator*

Country	Collaborators (n)	TGCS (n)	%
Australia	47	1177	46.0
USA	77	1135	44.4
Greece	9	190	7.4
UK	6	21	0.8
South Korea	3	18	0.7
Japan	1	9	0.4
China	1	6	0.2
Total	144	2556	100

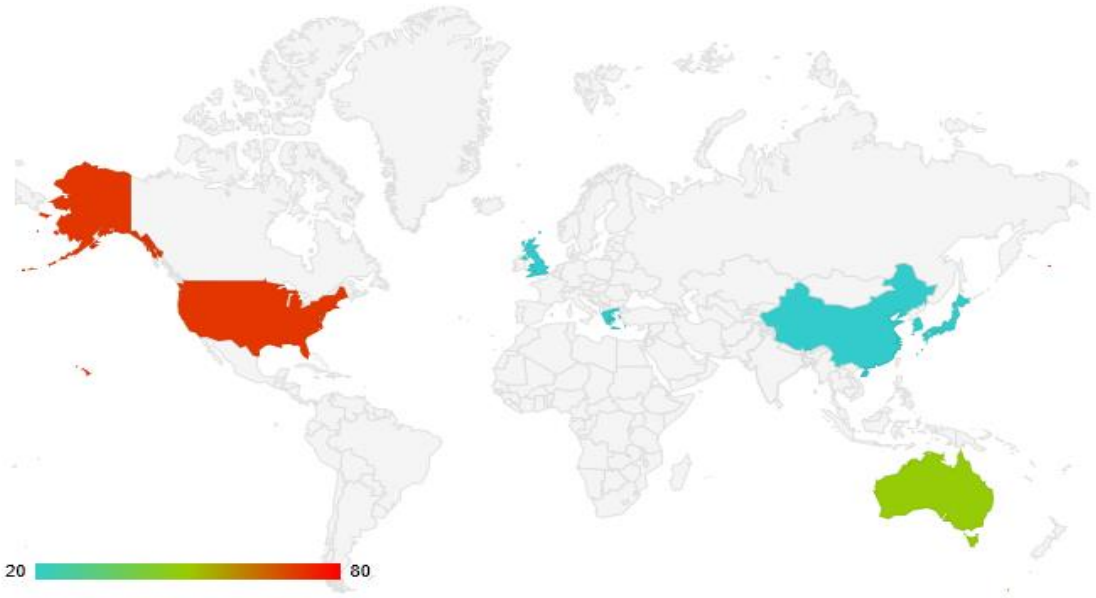

Figure 5. *Funk: Geographical Map Collaboration Country*

University affiliation of collaborators. Funk's scientific collaborators are distributed across a variety universities throughout these countries. Temple University (n=61), Griffith University (n=46), University of Louisville (n=8), Aristotle University (n=8), and the University of Florida (n=8) are the most prominent. In terms of TGCS, the universities with the greatest

number of Funk-related citations were Griffith University (n= 1642) and Temple University (n= 1037). This network is summarised in Table 5.

Table 5. *Research Collaborations: Most Active Institutions*

University	QS Ranking	Country	Research Collaborations		TGCS
			(n)	(%)	
Temple	301-350	USA	61	70.9	1037
Griffith	201-250	Australia	46	53.5	1642
Louisville	-	USA	8	9.3	277
Aristotle	601-800	Greece	8	9.3	242
Florida State	251-300	USA	8	9.3	241
Swinburne	351-400	Australia	8	9.3	128
Cent. Washington	-	USA	7	8.1	115
James Madison	-	USA	7	8.1	36
Old Dominion	601-800	USA	6	7.0	363
Texas	38	USA	5	5.8	302
Minnesota	79	USA	5	5.8	59
Florida	175	USA	4	4.7	168
Bournemouth	401-500	UK	4	4.7	50
Massachuesetts	201-250	USA	3	3.5	248

Figure 6 provides a temporal perspective to understanding the university of affiliation amongst Funk's collaborators. The size of the nodes indicates the number of publications, and the thickness of the links signifies the volume of collaborations with each institution The figure uses three colours to reflect Funk's three university affiliations: blue (University of Louisville, 2001-2005), turquoise (Griffith University, 2010-2014), and green (Temple University, 2011-).

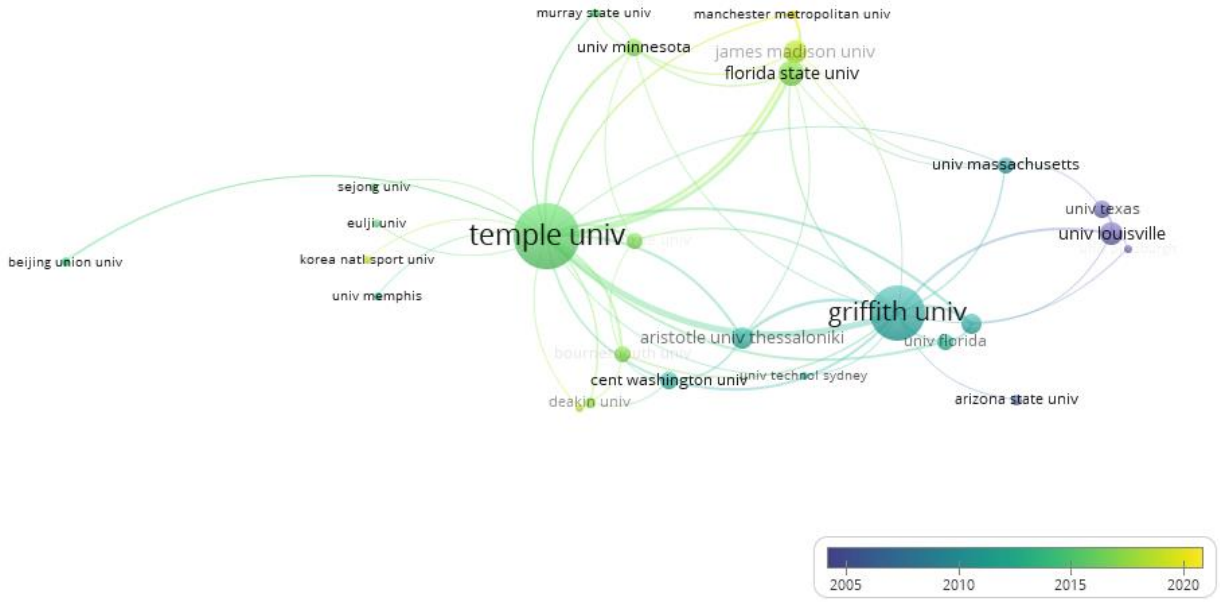

Figure 6. *Funk: Network of Collaborating Institutions*

Even during his University of Louisville years, Funk was already collaborating with colleagues at Griffith University, his future employer. During his Griffith University tenure, Funk published many articles with his Griffith University colleagues, but also with colleagues at Temple University, University of Louisville and Aristotle University of Thessaloniki. During his Temple University tenure, Funk has maintained his scientific connection with researchers from Griffith University, Aristotle University, University of Florida and Washington University. Funk has clearly leveraged his relationships with colleagues internal to his place of employment and also with colleagues at other universities.

Author-group size. We now turn our attention to the number of co-author group size amongst Funk's publications. Approximately 96% of Funk's publications have involved at least one co-author. Figure 7 summarises the distribution of author-group size in Funk's articles

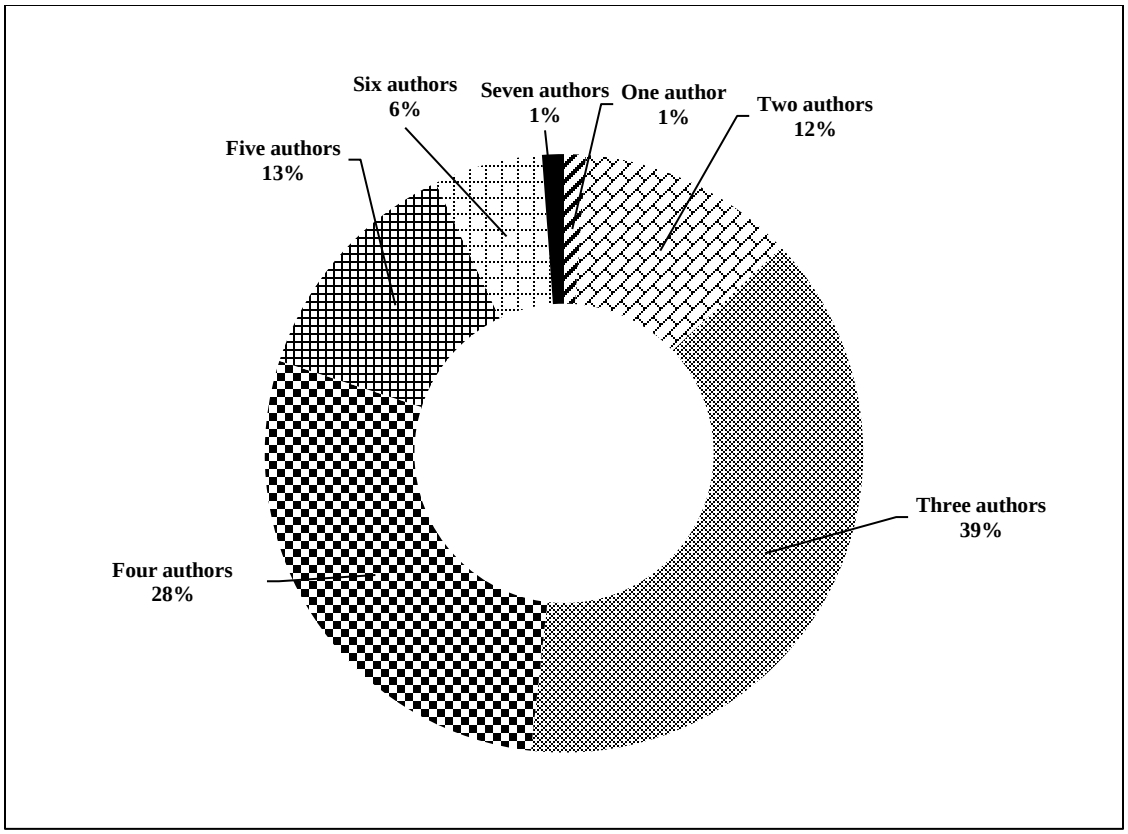

Figure 7. *Funk: Author-Group Size*

Journals

In this section we turn our attention to the journals that have published Funk's research. Funk's 86 articles have been published in 22 different journals. Table 6 summarises the journals with the highest proportion of Funk's articles.

Table 6. *Funk: Publication Journals*

Journal	Articles (n)	Impact Factor	Quartile	H-index	TGCS	Publication range
Journal of Sport Management	24	2.167	2	55	870	2002-2019
Sport Management Review	15	2.138	2	36	303	2011-2018
Journal of Leisure Research	9	1.12	4	56	195	2009-2019

Journal of Strength and Conditioning Research	6	3.017	1	116	149	2001-2010
Leisure Sciences	4	1.969	3	57	280	2004-2014

The analysis reveals that over half of Funk's articles are pubished in the Journal of Sport Management and Sport Management Review, arguably the two leading journals in the wider field of sport management. Journal of Sport Management accounts for 870 of Funk's citations, perhaps unsurprising given he has published 24 articles there and the journal has a H-index of 55.

Ideational Influencer and Influencees

The final part of our of scientometric portrait identifies the ideational influencers on Funk as well as those that Funk himself has influenced. Ideational influence reflects the extent to which a researcher's scientific ideas have been cited by the scientific community (Truex, Cuellar and Takeda, 2009, p. 585). Figure 8 summarises which authors have cited Funk the most (i.e. iauthors influenced by Funk) and which authors Funk has cited the most (i.e. authors influencing Funk).

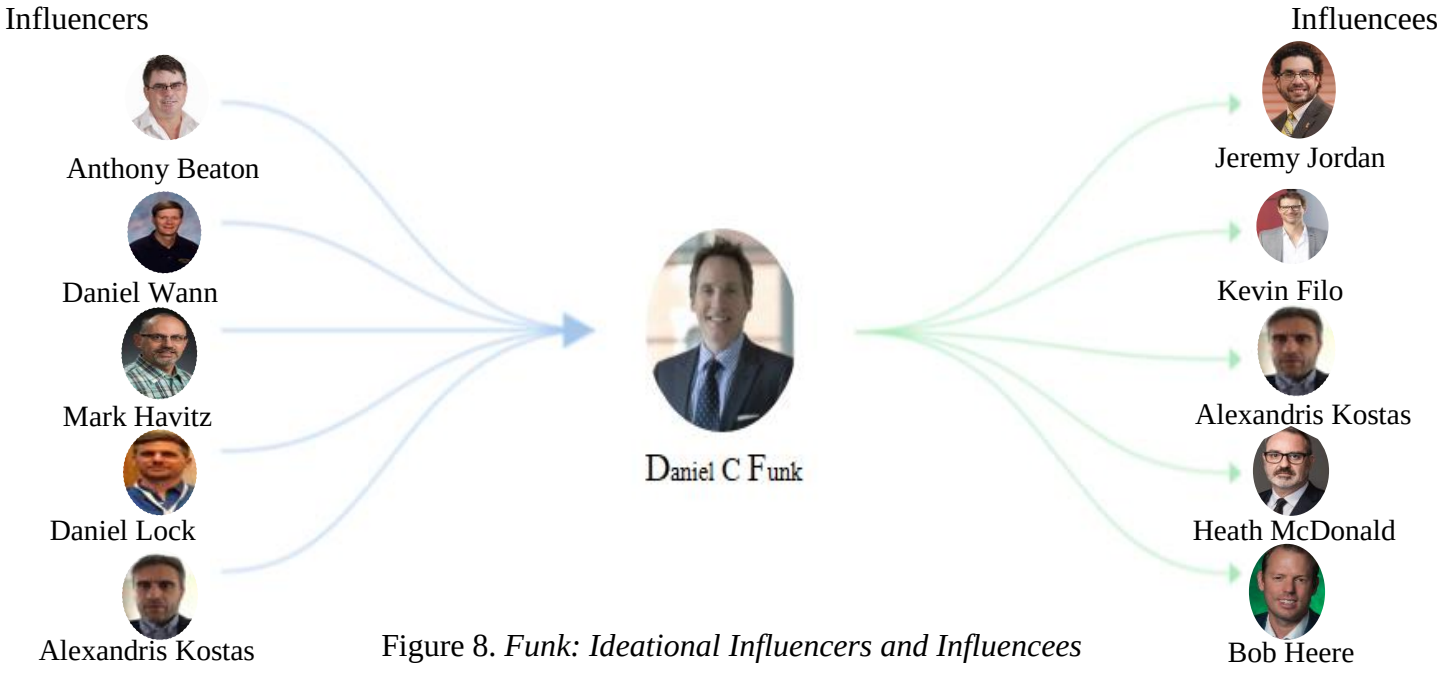

Figure 8. *Funk: Ideational Influencers and Influencees*

There are two anomalies in Figure 8. The first is that Kostas Alexandris is both a significant influencer and influencee. The second is that Anthony Beaton a noticeable influencer on Funk, is a former Funk PHD student.

Conclusion

Talented researchers should be appreciated and venerated whilst they are alive, not posthumously. Funk is arguably one of the most prolific and influential authors in the wider field of sport management, and perhaps the most prominent and and influential in the narrower field of sport marketing and consumer behaviour. This scientometric profile highlights the major aspects of the career of Dan Funk. These include a 20-year publishing career, pursuit of complementary research themes, a large number of co-authors and a relatively small number of high-value collaborators, and a willingness to pursue opportunities at different universities (and countries), a process which inevitably expands a researcher's network. Of course, these are just some of the necessary but ultimately insufficient hallmarks of a successful academic career. What the scientometric profile does not highlight is Funk's talent, work ethic, and resilience.

Scientometric portraits are valuable for many reasons. Scientometric portraits identify influential authors in a scientific field, and reveal otherwise latent behaviours patterns. This can clarify for (emerging) researchers behaviours worthy of emulation. There is no doubt that Funk's productivity makes him a role model for the next generation of researchers. The emergence of highly prolific authors is also a sign that the related academic fields of sport management, sport marketing and sport consumer behaviour are maturing.

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