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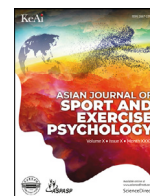
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Sport and exercise psychology research from the Asian and South Pacific region: A bibliometric analysis

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A B S T R A C T

Given that the Asian-South Pacific Association of Sport Psychology has recently passed 30 years since its creation, it would be interesting to examine the pattern of scientific publications of researchers from the Asian and South Pacific region over that period. This bibliometric analysis summarizes and analyses sport and exercise psychology publications from the region from the establishment of the Association in 1989 to the present. We conducted a systematic search of publications authored by researchers from the Asian and South Pacific region in nine sport and exercise psychology journals indexed in the Web of Science from 1989 to 2020. We analysed overall trends, the most prominent authors in terms of number of publications and citations, keywords as a reflection of noteworthy topics, and maps representing co-authorship, country, and institution clusters. Of the total of 1,003 publications, more than half were published after 2012. The most prolific authors with at least 30 publications each were James A. Dimmock, Ben Jackson, and Daniel F. Gucciardi who are all affiliated to Australian universities. Authors of the top 10 most cited publications are affiliated to Australian, New Zealand, and Singapore universities. The universities with the most publications were from Australia (University of Western Australia, University of Queensland, Curtin University, Victoria University, University of Wollongong, and Australian Catholic University), Hong Kong (University of Hong Kong), New Zealand (University of Otago), Singapore (Nanyang Technological University), and Taiwan (National Taiwan Sport University). There is co-authorship between countries in the Asian and South Pacific region as well as outside the region. Most of the collaborations outside the region were with the USA and England.

Introduction

Sport and exercise psychology (SEP) is a relatively recent branch of the discipline of psychology that also has a presence in the field of sport and exercise science around the world. Its modern development can be associated with establishment of the International Society of Sport Psychology (ISSP) at a conference held in Italy in 1965 (Morris, Hackfort & Lidor, 2003). At that time, the formal bases of the discipline were primarily in North America and Europe. Academic training and research in sport psychology was typically nurtured in countries when they developed a commitment to involvement and success in elite sport (Green & Houlihan, 2005). The North American Society for the Psychology of Sport and Physical Activity (NASPSPA) was established soon after ISSP in 1966, as was the European Federation of Sport Psychology (FEPSAC) in 1969. Periodically, individuals from Asian and South Pacific countries were elected to the ISSP Managing Council, including Atsushi Fujita, a Japanese professor. By the 1980s, Fujita rose to the status of Vice President in ISSP and delegates from economically developed countries in Asia and the South Pacific attended ISSP quadrennial congresses. However, highly organised academic SEP organisations were few and far between across the Asian and South Pacific region.

The development of academic journals that focused on SEP reflected the progression of discipline-based societies. ISSP sponsored a journal,

the *International Journal of Sport Psychology (IJSP)*, which started publication in Italy in 1970, driven by the then President of ISSP, Italian psychiatrist Ferruccio Antonelli. Toward the end of that decade, in 1979, NASPSPA published the first American journal, namely the *Journal of Sport Psychology (JSP)*, which changed its name to the *Journal of Sport and Exercise Psychology (JSEP)* in 1996. The SEP academic community expanded rapidly in North American universities during the 1970s and 1980s, leading to the creation of other journals. *The Sport Psychologist (TSP)* was first published in 1987 and the *Journal of Applied Sport Psychology (JASP)* started in 1989. These journals provide platforms for publication of applied research and the academic discussion of SEP practice, in contrast to the theoretical stance adopted by *JSEP* during this period (Landers, Boutcher & Wang, 1986). Keys to the development of SEP as a discipline in Europe and North America were the major organisations, especially ISSP, FEPSAC, NASPSPA, and AASP, and the SEP-specific journals that were developed from the 1960s to the 1980s.

No similar development had occurred in the Asian and South Pacific region, the most populous and diverse region in the world. In the late 1980s, President of ISSP, Robert Singer, led the development that would establish SEP in the Asian and South Pacific region. First, through ISSP, he encouraged ISSP Vice President Fujita to establish an organization to promote the development of SEP in Asia, with a close link to and support from ISSP. In 1988, Fujita convened a meeting during

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the Seoul Olympic Scientific Congress, at which he gained support for the creation of an Asian SEP body from a number of interested individuals. Concurrently, Singer stimulated organization of the first ISSP congress in Asia, which took place in Singapore in 1989. It was at the 1989 ISSP 7th World Congress of Sport Psychology that the statutes of the Asian-South Pacific Association of Sport Psychology (ASPASP) were ratified and Fujita was elected President. Now, just over 30 years since the inauguration of ASPASP, the Asian and South Pacific region's first sponsored SEP journal, the *Asian Journal of Sport and Exercise Psychology (AJSEP)*, has been established, so it is highly appropriate that the academic and applied development promoted by ASPASP (see Morris & Terry, this issue) is examined. We conducted a bibliometric review to uncover trends in the development of SEP in the Asian and South Pacific region since the creation of ASPASP in 1989.

Bibliometric reviews are a relatively recent development in the field of SEP. Bibliometrics can be described as statistical analysis of the published communication of a field or discipline (Lindahl, Stenling, Lindwall & Colliander, 2015). It is a practical way to draw a macroscopic picture of a large amount of data in an academic literature (van Nunen, Li, Reniers & Ponnet, 2018). Bibliometric studies map the development of a specific field and performance of its contributors through a set of quantitative analyses of various data, such as citation counts of authors and journals, countries and institutions, and cooperation between authors (Jia, Dai & Guo, 2014). Bibliometric research could also highlight past and present trends as well as identify current gaps (Gall, Nguyen & Cutler, 2015). The results could provide insight for decision makers in terms of planning, policy making, and allocation of funding in certain disciplines. To date, only two bibliometric reviews have been published in SEP. Lindahl et al. (2015) examined the trends and knowledge base in SEP between 2008 and 2011. Olmedilla et al. (2017) conducted a bibliometric review of doctoral theses on sport psychology published in the Spanish General University Board database TESEO from 1976 to 2015.

There have been a variety of types of qualitative review of SEP. According to Lindahl et al. (2015), these include qualitative analysis of publications in sport psychology between 1975 and 1991 (Tenenbaum & Bar-Eli, 1995), published articles in *TSP* from 1985 to 1992 (Vealey, 1994), exercise and fitness-related publications in 10 sport, exercise, and health psychology journals from 1990 to 1994 (Gauvin & Spence, 1995), psychology publications in the *Journal of Sports Sciences (JSS)* between 1996 and 2000 (Markland, 2001), and a comprehensive content analysis of publications in *IJSP* and *JSEP* between 1985 and 1994 (Biddle, 1997). A noteworthy addition since Lindahl et al. published their list is the qualitative review of trends in the *IJSP* over 50 years (1970–2019), by Terry, Parsons-Smith, Quartirolì, and Blackmore (2020). These qualitative reviews have provided valuable information about research and practice in SEP, but they are limited. Some focused on relatively short periods of time, so they cannot claim to definitively reflect continuing themes. Other reviews targeted specific aspects of SEP, such as exercise and fitness, whereas a number of reviews focused on a small sample of journals, which might have favoured certain aspects of SEP. Thus, the conclusions of each review must be limited to the target topic or qualified by the specific journals sampled. Importantly, such qualitative reviews and even meta-analyses, that apply statistical techniques to a specific research topic, cannot reflect the major fields and the interconnections between topics in a field as it expands in the way that SEP has expanded in recent times, and is expected to continue to expand in the future. Examining the development of SEP in the Asian and South Pacific region over 30 years, which is a much longer period than is typical of qualitative reviews, covering the whole field of SEP, and drawing on a substantial number of the key discipline-specific journals is a challenge that is beyond qualitative reviews. However, bibliometric analysis is ideally suited to such a task because it has the potential to group the extensive set of data by important factors, such as authors, topics, countries, and institutions within the field.

The purpose of this paper is to report the results of a bibliometric analysis that was constructed to examine the research that has been published in SEP by authors from the Asian and South Pacific region since the initiation of ASPASP in 1989 until early in 2020, across the principal discipline-specific SEP journals in the field. In this bibliometric review, we consider patterns relevant to presenting a picture of the growth of SEP publications over the designated time period, the authors who published key papers, that is, those that are most widely cited, the topics that are prominent in the literature, the countries from which those publications emanated, and major institutional affiliations. We discuss insights about the development of the field in the region and consider how this might reflect on the growing influence of ASPASP on training, research, and practice of SEP in the Asian and South Pacific region.

Method

On 26 May 2020, we conducted a systematic search in nine SEP journals (*International Journal of Sport Psychology [IJSP]*, *International Review of Sport and Exercise Psychology [IRSEP]*, *Journal of Applied Sport Psychology [JASP]*, *Journal of Clinical Sport Psychology [JCSP]*, *Journal of Sport and Exercise Psychology [JSEP]*, *Psychology of Sport and Exercise [PSE]*, *Sport, Exercise and Performance Psychology [PSESEPP]*, *The Sport Psychologist [TSP]*, and *Zeitschrift fur Sportpsychologie [ZSP]*) indexed in the Web of Science. We chose this database because it includes the most significant and impactful publications (Herrera & de las Heras-Rosas, 2020) and is employed as one of the main criteria in making academic decisions (Jiménez-García, Ruiz-Chico, Peña-Sánchez & López-Sánchez, 2020; Seipel, 2003). We searched for countries in Asia and the South Pacific in the address category combined with the Boolean Operator OR (Afghanistan OR Armenia OR Azerbaijan OR Bahrain OR...). This search yielded 1943 results. We then refined our search to publications published from 1989 onwards. We screened the results to remove publications with University of Georgia, USA in the address. We also excluded meeting abstracts, corrections, editorial material, letters, notes, and retractions from our analyses. This resulted in 1003 publications in our data set, which we transferred to an Excel sheet for further analysis and calculations.

Results and discussion

In this section, we have integrated the results and discussion because we consider that this is the most effective way to present the data we have analysed and to interpret what we found in this research process. In the sequence in which they are presented, we examine overall trends, the most prominent authors in terms of number of publications and citations, keywords as a reflection of noteworthy topics, and maps representing co-authorship, country, and institution clusters, discussing each topic as we report our findings.

Overall trend

There has been an increase in the number of publications from authors in Asian and South Pacific countries through the years (see Fig. 1). With less than 10 publications per year from 1989 to 1993, the number increased to over 25 publications a year from 2006 onwards (there were 24 publications for 2020 when the search was conducted in May). The highest number of publications ($n = 95$) was recorded in 2019. Of the total of 1003 publications, more than half were published after 2012.

The most popular SEP journal among Asian and South Pacific researchers is *PSE* (332 publications), followed by *IJSP* (223 publications), *JSEP* (184 publications), *JASP* (108 publications), *TSP* (89 publications), *SEPP* (35 publications), *IRSEP* (17 publications), and *JCSP* (10 publications). Understandably, the least number of publications appeared in the German language journal *ZSP* (5 publications). The five journals with the most publications from the region have been indexed in Web of Science for more than 15 years. The other English language journals

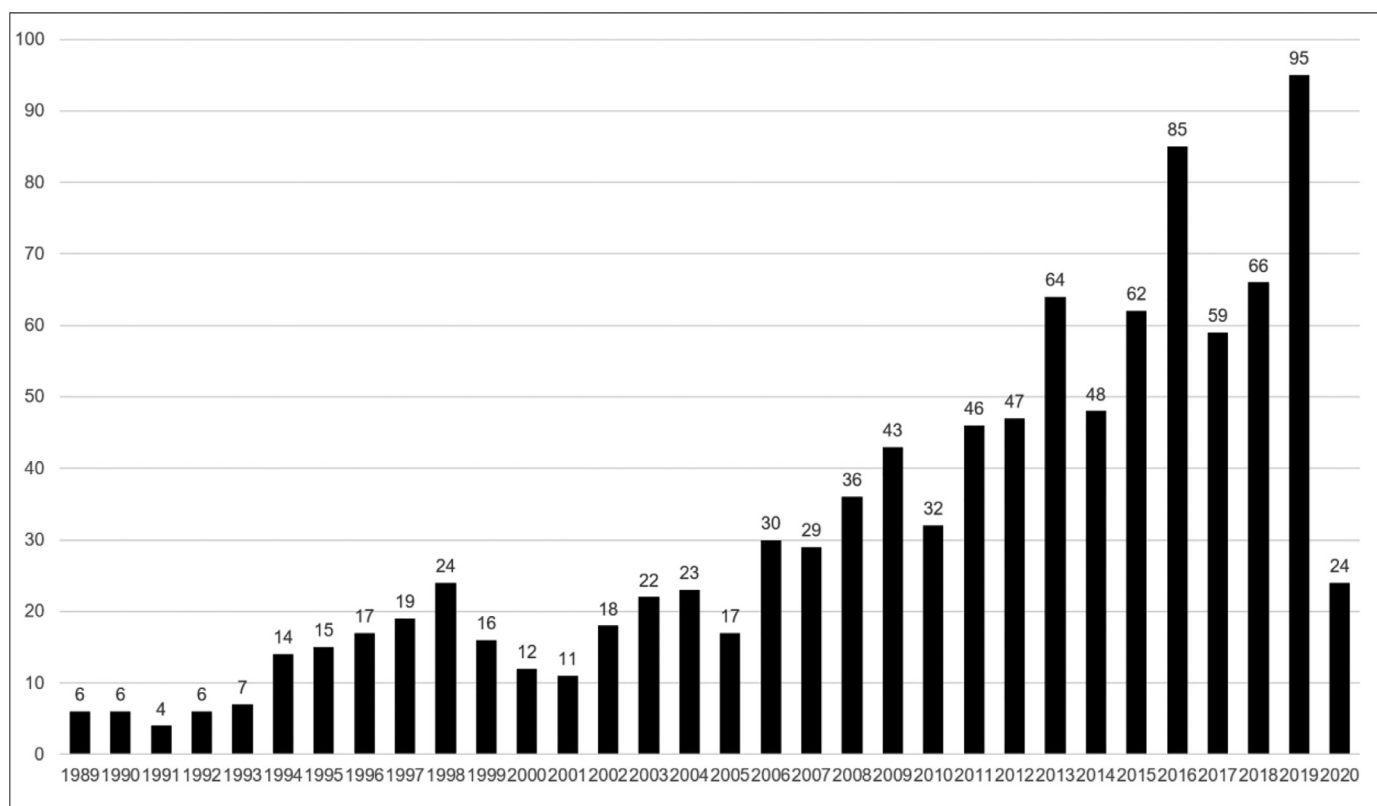


Fig. 1. Sport and Exercise Psychology Publications from the Asian and South Pacific region between 1989 and 26 May 2020.

have only been indexed in the last eight years. Most of the publications were articles ($n = 928$). Reviews ($n = 36$) appeared in five journals (*IJSP*, *IRSEP*, *JASP*, *JSEP*, and *PSE*) with half published in *PSE*.

It would be expected that the longer journals have been publishing, the more articles there would be involving Asian and South Pacific authors. However, when total articles are divided by several measures of the longevity of journals, *PSE* (18.44) is by far the most popular journal among Asian and South Pacific researchers with *IJSP* next (7.19) and then *JSEP* (5.94). Other factors could also influence the frequency of publication. Two obvious publication variables that could change are the number of issues of the journal per year, which can increase over time as the journal gains popularity, and the number of articles in each issue, which has shown increases in some journals in recent years as they have moved to electronic publication, where the previous financial limits to journal size are minimized. Nonetheless, it is clear that Asian and South Pacific authors are both leading more research and collaborating with other authors more often in research as they gain skill and confidence, and also as they network more with colleagues in and outside the region.

Authors and affiliations

A total of 1683 authors from 42 countries contributed to the publications. The South Pacific was represented by authors from Australia and New Zealand. There were no authors from the Pacific Island Countries. Nineteen Asian countries from the sub-regions of East Asia, South Asia, South East Asia, and West Asia contributed publications, with East Asia being the most prolific sub-region. There were no publications from Central Asia.

The 10 universities with the highest publications in Asian and South Pacific countries were from Australia (University of Western Australia, University of Queensland, Curtin University, Victoria University, University of Wollongong, and Australian Catholic University), Hong Kong (University of Hong Kong), New Zealand (University of Otago), Singa-

pore (Nanyang Technological University), and Taiwan (National Taiwan Sport University). These universities accounted for 56.3% of the total publications. Australia's productivity is probably related to funding, because the top funding agency was the Australian Research Council which funded 26 research projects.

In Table 1, we list the 44 authors who had at least 10 publications each. We have distinguished those authors into three categories. First, authors whose affiliations on their publications were to Asian countries (signified by *). Second, authors whose affiliations on their publications were to Australian or New Zealand institutions or if their origin was Australia or New Zealand (signified by #). Third, authors whose affiliations on their publications were primarily (> 65%) to countries outside the Asian and South Pacific region. This resulted in four authors having Asian affiliations, 26 authors having South Pacific affiliations, and 14 authors having affiliations outside the Asian and South Pacific region.

The most prolific authors with at least 30 publications each were James A. Dimmock, Ben Jackson, and Daniel F. Gucciardi who are all affiliated to Australian universities.

Citations for the top 10 most cited authors ranged from 724 to 2245. The authors are currently affiliated to Australian, New Zealand, and Singapore universities. The author with the highest number of citations is Herbert W. Marsh with 2245 citations. As the only author with more than two thousand citations within the Asian and South Pacific region, Marsh also has the highest citations per publication (86.4).

Among the authors from the Asian and South Pacific region, the predominance of South Pacific authors and the small number of Asian authors reflects the decision to examine mainly major sport and exercise psychology journals published in the English language (only *ZSP* is not an English language journal, being published in German). Countries and regions like Japan, China, Korea, and Taiwan certainly have a long history of research in SEP, with well-regarded scholars. However, many of these authors have preferred to publish their research in prestigious journals in their native language.

Table 1
Authors with the most publications and citations.

Author's Name	Total publications	Total citations
*Dimmock, James A.	43	798
#Jackson, Ben	41	459
*Gucciardi, Daniel F.	38	981
Tenenbaum, Gershon	34	487
Eklund, Robert C.	32	2302
Ntoumanis, Nikos	27	316
*Grove, J. Robert	26	791
*Marsh, Herbert W.	26	2245
#Hodge, Ken	25	1014
*Andersen, Mark B.	24	724
Hagger, Martin S.	24	614
*Lonsdale, Chris	24	939
*Masters, Rich S. W.	22	353
*Morris, Tony	22	155
*Chang, Yu-Kai	21	396
#Swann, Christian	21	143
*Vella, Stewart A.	20	196
*Wang, C. K. John	20	815
*Mesagno, Christopher	19	327
*Farrow, Damian	18	317
*Gordon, Sandy	18	686
*Jackson, Susan A.	18	1688
Kerr, John H.	18	317
*Mallett, Clifford J.	17	604
Chatzisarantis, Nikos L. D.	17	461
*Hanrahan, Stephanie J.	16	341
*Hung, Tsung-Min	16	226
*Prapavessis, Harry	16	582
*Abernethy, Bruce	15	659
#Davids, Keith	15	1033
Van Der Kamp, John	15	308
Asci, F. Hulya	13	265
*Bar-Eli, Michael	13	283
Anshel, Mark H.	12	335
Crust, Lee	12	118
Quested, Eleanor	12	133
*Macmahon, Clare	11	211
Thogersen-Ntoumani, Cecilie	11	41
Araujo, Duarte	11	839
*Huang, Chung-Ju	10	92
*Maxwell, Jonathan P.	10	318
*Rebar, Amanda L.	10	72
Reeve, Johnmarshall	10	391
*Whipp, Peter R.	10	90

Note.

* authors with Asian affiliations.

authors with South Pacific affiliations.

In addition, some ambiguity might arise because motor learning has long been considered to come under the generic umbrella of “sport psychology”. For example, it has always been a part of ISSP, with a section in the Society’s world congresses and ASPASP has followed this model. However, there are a number of well-reputed motor learning journals in which specialists in that area often prefer to publish. This means their work is under-represented in the SEP journals that we surveyed.

Highly cited publications

The top 10 most cited publications are presented in Table 2. They were published between 1992 and 2015 in five journals (*IJSP*, *JASP*, *JSEP*, *PSE*, and *TSP*), with 76% in the *JSEP* ($n = 22$) and *PSE* ($n = 16$). Nearly all the top cited publications were articles, except for two reviews published in *PSE*. The top-cited publication was “Development and validation of a scale to measure optimal experience: The Flow State Scale” by Jackson & Marsh, 1996 with 448 citations. Marsh was associated with the largest number ($n = 9$) of top cited publications. Marsh also authored the second most cited publication “Physical self-description questionnaire - psychometric properties and a multitrait-multimethod analysis of relations to existing instruments” with 388 citations published in 1994.

The publication with the highest average citations per year was “The ecological dynamics of decision making in sport” by Araujo, Davids and Hristovski (2006) with 23.1 citations per year. Araujo also authored the publication (“Representative learning design and functionality of research and practice in sport”) with the second most citations per year (22.6). Eight of the top-cited publications also had the highest average citations per year (marked with asterisks in Table 2).

The pre-eminence of publications on the concept of flow (Jackson & Eklund, 2002; Jackson & Marsh, 1996; Jackson et al., 2001) reflects the key role of Susan Jackson in transferring the concept from mainstream psychology, where it had previously attracted some attention, following Csikszentmihalyi’s (1975) introduction of theory and research on flow. A substantial increase in interest in flow in psychology generally, as well as in SEP, then occurred with Seligman and Csikszentmihalyi’s (2000) promulgation of the now burgeoning field of positive psychology, within which flow is a prominent concept. Flow had particular appeal in SEP because of its status as a positive psychological state that can particularly be experienced during sport and exercise performance. The popularity of Marsh’s physical self-description construct and instrument (Marsh, Richards, Johnson, Roche, & Tremayne, 1994) was perhaps more fleeting. Its attraction was that it represented a concept that was specifically related to sport and exercise, whereas many concepts employed in SEP at that time were borrowed from mainstream psychology. Despite the under-representation referred to earlier, motor learning publications form the other major category in the 10 most cited articles in Table 3. Two of these articles (Araujo et al., 2006; Pinder et al., 2011) reflect the growth of interest in an approach to understanding perception and movement termed ecological psychology, which is based on Gibson’s (1966) seminal work. These papers were among the more accessible sources of a challenging view of how perception works and how it leads to movement. The other motor learning paper was a key contribution to the area of expertise (Baker et al., 2003), which examined the nature and development of expertise in a new way, namely by using historical interviews to explore the experiences through which the greatest experts in sport had attained their skill. This approach pioneered by Ericsson (Ericsson & Smith, 1991) appears to present a bridge between motor learning and sport psychology, which sparked considerable interest.

We conducted an analysis of the keywords authors used with their publications over the 30 years from 1989 to 2020 in the nine journals chosen for the bibliometric analysis. Table 3 lists the top 21 keywords that emerged from this analysis.

Examining the list in Table 3, some distinctions should be made. First, a number of the keywords refer to the type of activity that was the focus of various studies. Noteworthy here are physical activity with the highest frequency of use (71) and exercise (44) with the second highest frequency, while sport is fifth highest. An interesting point is that authors from the Asian and South Pacific region published about three times as many exercise psychology articles (115) as sport psychology articles (38) during the period 1989–2020. This might partly be because keywords sometimes refer to the specific sport studied, e.g., basketball, football, tennis, rather than using the generic term “sport”. As would be expected, many keywords refer to the psychological processes examined. Prominent among these in terms of frequency of use are motivation (41), Self-determination Theory (40), stress (27), expertise (24), and anxiety (20). It should be noted that these keywords could sometimes be cited in the same publications. For example, Self-determination Theory and self-efficacy (19) could often be associated with motivation, while stress and anxiety might be co-cited or each cited with coping. Certain keywords refer to the type of study conducted, e.g., intervention (22) and scale development (17), whereas others reflect the major statistical analysis executed, e.g., confirmatory factor analysis (16). Over the period covered by this bibliometric review, it is clear that motivation, including self-efficacy (18), was the most extensively studied psychological process. Combining the predominant type of activity and the major psychological processes identified in the analysis in Table 3 seems

Table 2
Top cited publications based on total citations.

	Publication	Total citations	Average citations per year
1*	Jackson & Marsh, 1996. Development and validation of a scale to measure optimal experience: The Flow State Scale. <i>Journal of Sport & Exercise Psychology</i> , 18(1), 17–35.	448	18.7
2*	Marsh, Richards, Johnson, Roche, & Tremayne, 1994. Physical Self-Description Questionnaire: Psychometric properties and a multitrait-multimethod analysis of relations to existing instruments. <i>Journal of Sport & Exercise psychology</i> , 16(3), 270–305.	388	14.9
3*	Araujo et al. (2006). The ecological dynamics of decision making in sport. <i>Psychology of Sport and Exercise</i> , 7(6), 653–676.	324	23.1
4*	Baker, Cote and Abernethy (2003). Sport-specific practice and the development of expert decision-making in team ball sports. <i>Journal of Applied Sport Psychology</i> , 15(1), 12–25.	272	16.0
5*	Jackson & Eklund, 2002. Assessing flow in physical activity: the Flow State Scale-2 and Dispositional Flow Scale-2. <i>Journal of Sport & Exercise Psychology</i> , 24(2), 135–150.	260	14.4
6*	Terry, P. C., Lane, A. M., & Fogarty, G. J. (2003). Construct validity of the Profile of Mood States—Adolescents for use with adults. <i>Psychology of Sport and Exercise</i> , 4(2), 125–139.	243	14.3
7*	Pinder, Davids, Renshaw and Araújo (2011). Representative learning design and functionality of research and practice in sport. <i>Journal of Sport & Exercise Psychology</i> , 33(1), 146–155.	203	22.6
8	Williams, J. M., & Andersen, M. B. (1998). Psychosocial antecedents of sport injury: Review and critique of the stress and injury model'. <i>Journal of Applied Sport Psychology</i> , 10(1), 5–25.	200	9.1
9*	Lonsdale, C., Hodge, K., & Rose, E. A. (2008). The Behavioral Regulation in Sport Questionnaire (BRSQ): Instrument development and initial validity evidence. <i>Journal of Sport & Exercise Psychology</i> , 30(3), 323–355.	193	16.1
10	Jackson, Thomas, Marsh and Smethurst (2001). Relationships between flow, self-concept, psychological skills, and performance. <i>Journal of Applied Sport Psychology</i> , 13(2), 129–153.	174	9.2

Table 3
Top 21 Keywords in Nine Journals from 1989 to 2020.

Keyword	Frequency
Physical activity	71
Exercise	44
Motivation	41
Self-determination Theory	40
Sport	38
Stress	27
Expertise	24
Intervention	22
Anxiety	20
Self-efficacy	19
Coping	18
Performance	18
Physical self-concept	17
Scale development	17
Coaching	16
Confirmatory factor analysis	16
Gender	15
Sport psychology	15
Athletes	14
Autonomy support	14
Construct validity	14

to reflect the preoccupation of researchers in the discipline with the global drive to increase participation in physical activity during the period we are examining in this bibliometric review (World Health Organization, 2004, 2018).

To expand on the question of trends across the 30-year period studied, we conducted a keyword analysis of each 5-year period from 1989 to 2020. The trends are presented in Table 4. The temporal evolution of trends based on the most frequently used keywords over the six 5-year periods shows that physical activity, exercise, and sport have been among the ten most used keywords in the last 15 years, whereas motivation and Self-determination Theory have been prominent during the last

10 years. Physical activity was the most frequently used keyword from 2006 to 2020. Exercise was one of the three most frequently used keywords during that period. While the broader concept of motivation has gained prominence, the area of stress, anxiety, and coping, which was preeminent in the period from 1989 until 2005, has declined somewhat in the published work of Asian and South Pacific authors in SEP. Physical self-concept was a popular topic in the 1989 to 2005 period, during which confirmatory factor analysis was an important enough method of statistical analysis to be in the top 10 keywords in all three 5-year periods.

We adopted an approach using VOSviewer to chart research clusters and co-citations among authors and research topics, countries, and universities, in and related to the Asian and South Pacific region, across the nine major SEP journals. Fig. 2 reflects clusters of authors and their primary research topics.

Eleven clusters were identified, each with a lead author and one or more co-authors. These are presented in Table 6. We have identified major research topics for most of the clusters. The cluster numbers in Table 6 correspond to the numbers adjacent to each cluster in Fig. 2. Naming the topic for each cluster is complicated because some authors are cited in more than one cluster. For example, Gucciardi's work is cited in three clusters. Also, some clusters appear to include authors with different primary research interests. For example, in Cluster 9, Morris has conducted research on imagery with Watt and studies on choking with Mesagno and Marchant. Further, in Cluster 11, Tenenbaum has published extensively, but with a small number of publications on each of a number of different topics, so it is difficult to identify a unifying theme for that cluster. Finally, there are major topics over the last 30 years that are not identified in this analysis, such as stress and anxiety in sport, and flow in sport and exercise.

The extent of co-authorship between countries is shown in Fig. 3. The number of author collaborations is represented by the thickness of lines linking countries. This map of links between countries shows publications emanating from Asian and South Pacific countries and links with other Asian and South Pacific countries. Also, there are links be-

Table 4
Temporal evolution of trends based on most frequently used keywords.

1989–1995		1996–2000		2001–2005		2006–2010		2011–2015		2016–2020	
Keywords	F	Keywords	F	Keywords	F	Keywords	F	Keywords	F	Keywords	F
Construct validity	3	Stress	5	Physical self-concept	5	Physical activity	11	Physical activity	21	Physical activity	33
Physical self-concept	3	Confirmatory factor analysis	4	Stress	5	Exercise	10	Motivation	19	Exercise	20
Competition	2	Burnout	3	Coping	4	Expertise	9	Exercise	14	Self-determination Theory	20
	2	Gender	3	Athletes	3		6	Self-determination Theory	14	Motivation	17
Confirmatory factor analysis	2	Coaching	2		3	Measurement	6	Self-efficacy	12	Intervention	13
Emotion	2			Confirmatory factor analysis		Sport	6				
		Coping style	2	Gender	3	Anticipation	5	Expertise	10	Sport	13
Gender	2	Elite athletes	2		3	Anxiety	5	Sport	10	Performance	10
Personality	2			Measurement							
		Hardiness	2	Psychometrics	3	Reversal theory	5	Autonomy support	8	Anxiety	9
Physical activity	2	Physical activity	2	Self-esteem	3	Body image	4	Coping	8	Athletes	9
Physical self-description questionnaire	2										
Self-description questionnaire	2	Physical self-concept	2	Sport	3	Motivation	4	Coaching	7		
Wheelchair	2	Scale development	2	Physical self-concept	5	Practice	4	Performance	7		
		Self-concept	2								
		Sport	2								

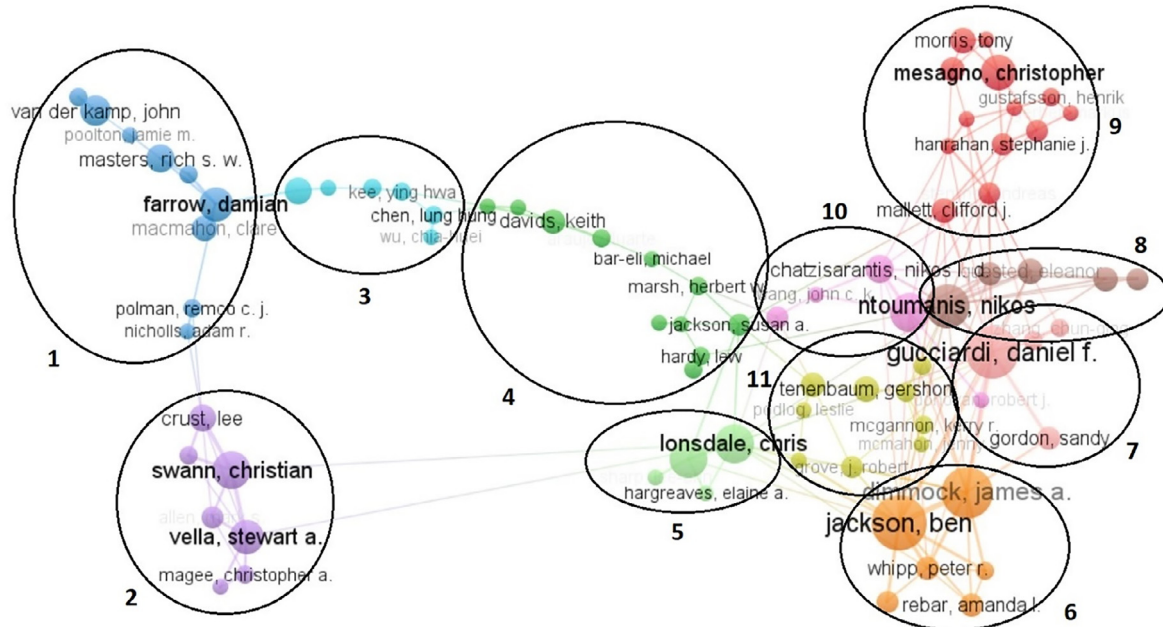


Fig. 2. Co-authorship clusters.

tween various countries within the Asian and South Pacific region and co-authorship with countries outside the Asian and South Pacific region. Publications by authors affiliated with institutions in Australia is most prominent and central, then publications associated with the USA, Canada, England, and Wales. Australia has the strongest links with England and USA. Several Asian countries are present, but they tend to be

on the periphery of the map and of specific clusters. Thus, Australia is associated with China, as is New Zealand, and Australia also has strong publishing links with South Korea and Malaysia. Links are also evident between Asian countries, for example, Taiwan with Singapore and Japan; Korea with Malaysia and Iran. It is possible that these links between Asian countries have been fostered by ASPASP through contacts

Table 6
Research clusters and co-cited authors.

Cluster Number	Research Theme/s	Most Active Author	Co-authors
1	Motor Learning	Farrow	Buszard, Masters
2	Mental Toughness/Health	Swann	Crust, Vella
3	Skill and Expertise	Abernethy	Cote, Farrow
4	Ecological Psychology	Dauids	Araujo
5	Burnout and Overtraining	Hodge	Lonsdale
6	Active Healthy Living	Dimmock	Jackson
7	MentalToughness/Resilience/ Hardiness	Gucciardi	Dimmock, Gordon, Ntoumanis
8	Motivation/Self-determination Theory	Ntoumanis	Thogersen-Ntoumanis, Qusted, Gucciardi
9	Imagery and Choking	Morris	Watt, Mesagno, Marchant
10	Motivation and Physical Activity	Hagger	Chatzisarantis
11	Various Sport Psychology	Tenenbaum	Schinke, Eklund

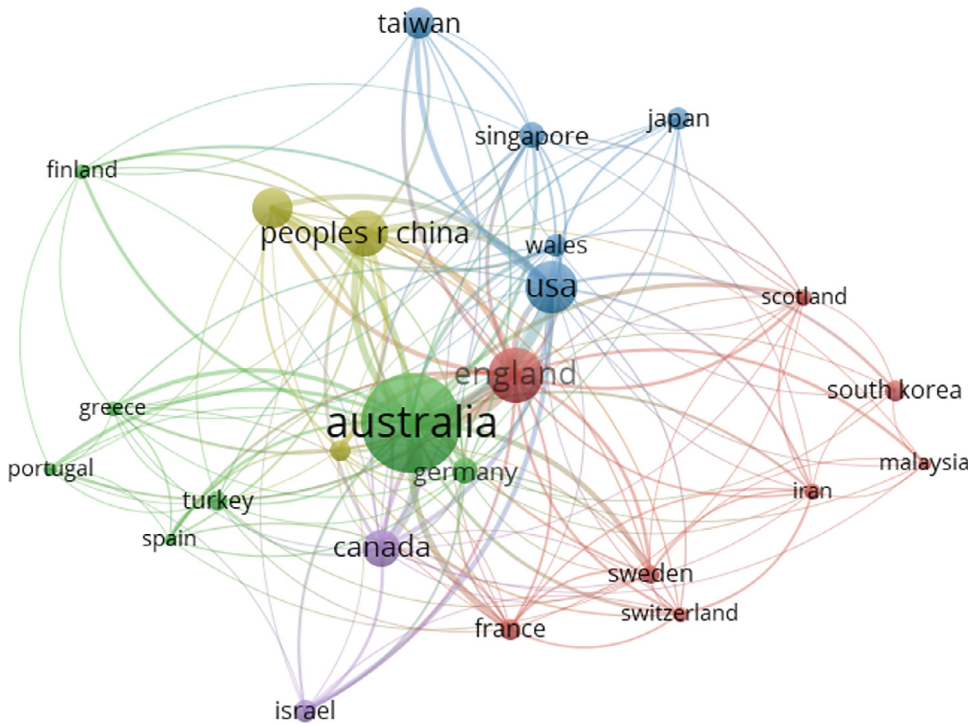


Fig. 3. Co-authorship between countries.

made at the quadrennial ASPASP International Congresses and through Managing Council meetings and ASPASP official visits to various Asian countries.

Fig. 4 shows the collaborations between universities. There are eight clusters and the most active university in each cluster is identified. The most active universities from the Asian and South Pacific region are University of Western Australia (104 publications), University of Queensland (85 publications), Victoria University (67 publications), Curtin University (67 publications), University of Hong Kong (61 publications), University of Otago (55 publications), and National Taiwan Sport University (26 publications). The strong performance by the University of Hong Kong, despite the absence of Hong Kong in the countries map, probably reflects the influence of Abernethy, from the University of Queensland, Australia and originally from New Zealand, and Masters, originally from New Zealand, who do figure in the authors' map. The top collaborations are within universities in Asia, where there are 12 co-authorships between National Taiwan Sport University and National Taiwan Normal University. This collaboration between the top two Taiwanese universities for sport is, perhaps, a reflection of the relative isolation of Taiwan for a substantial part of the period we examined. However, the strong connection between Taiwan and the USA that is evident in the countries map, is indicative of the product of training of Taiwanese academics in SEP in the USA. Within Australia there are 11

co-authorships between the University of Western Australia and Curtin University. There are also collaborations between universities in and outside Asia and the South Pacific, with 13 co-authorships between University of Hong Kong and Vrije Universiteit Amsterdam, another major international center for motor skill and expertise research during much of the 30-year period we examined. In addition, there are 10 co-authorships between Curtin University and Birmingham University, in the UK, which has an outstanding international reputation in motivation research that extends back much further than that of Curtin.

Conclusions

There is evidence that first generation sport and exercise psychologists, in countries and regions including Taiwan, Hong Kong, Singapore, and South Korea, graduated with PhDs from North American, United Kingdom, and Australian universities and have since developed academic programs in their own country, leading to the emergence of a new generation of home-grown researchers. Notable researchers who graduated with a PhD from such universities and then returned home to develop young academics in their own country include Yu-Kai Chang, Ernest Tsung-Min Hung, Chung-Ju Huang, and Likang Chi (Taiwan), Gangyan Si, who completed his PhD in Germany, and Henry Li (Hong

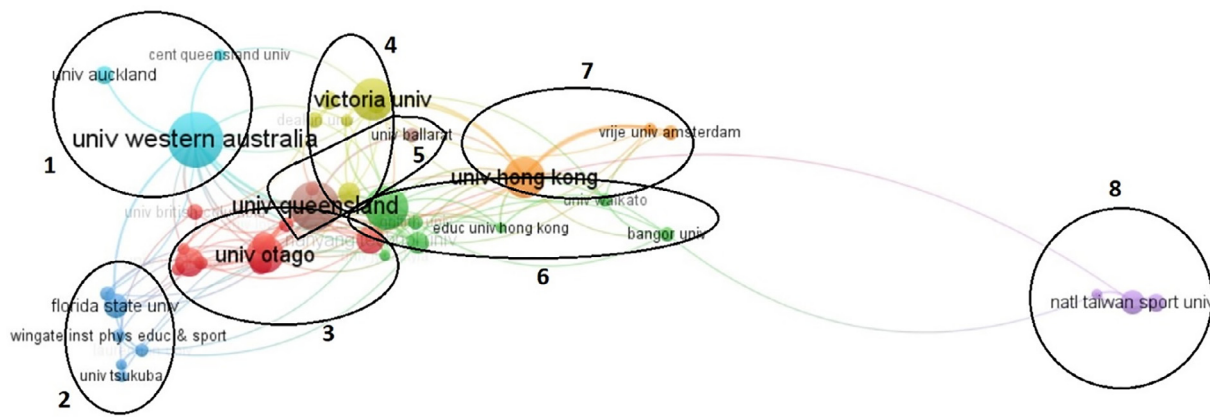


Fig. 4. Institutional collaboration network.

Kong), John C. K. Wang (Singapore), Myung-Woo Han, Young-Ho Kim, and Jihang Lee (South Korea).

There has also been mobility of researchers between regions. Researchers who moved from countries outside Asia and the South Pacific to work in research and teaching in Asian and South Pacific countries have contributed strongly to publications. Australia seems to be a popular choice among researchers who have spent a substantial proportion of their careers in their host country. Examples include Sandy Gordon and Robert Grove (University of Western Australia), Herbert Marsh (Western Sydney University), Stephanie Hanrahan (University of Queensland), Tony Morris and Mark Andersen (Victoria University), Peter Terry (University of Southern Queensland), and Martin Hagger (Curtin University).

Eight journals considered in this review were in the English language which could explain the publication productivity we found for countries like Australia and New Zealand. There are SEP journals in Asian languages (e.g., Japanese Journal of Sport Psychology, Korean Journal of Sport Psychology), which are not indexed in Web of Science. These national periodicals could be the journal of choice for researchers in those countries. This choice of a restricted number of English language journals of international renown limits the conclusions from the present bibliometric review. This is because the long-established academic systems in sport psychology, particularly in Japan, China, and South Korea, are supported by strong academic publishing systems, including scientific journals, in psychology, sport science and medicine, as well as SEP, in which researchers from those countries have long published. The expertise and documented research in Chinese, Japanese, and Korean languages and others represents a substantial resource that was not considered in the present bibliometric review. A more wide-ranging review, including scientific journals in all the languages of the Asian and South Pacific region, and going beyond periodicals cited in the Web of Science, would provide a more complete picture of the development of SEP in this region. The present review represents a starting point for such an endeavour that reflects the growing influence of SEP research from the Asian and South Pacific region at the global level.

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