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RESEARCH ARTICLE

Participation of Australian women and girls in traditionally male-dominated sports 2016-2018

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ABSTRACT

There have been increased opportunities for women and girls to play traditionally male-dominated sports. However, we do not know the impact of these opportunities on participation. The study aim was to investigate the changing sport participation trends of women and girls, and in particular the increasing rates of participation in traditional male-dominated sports. Australian community-level registered sport participant data from five sports (three male-dominated, one female-dominated, and one gender-neutral) was tracked over the three years 2016–2018. There were 513,270 participants in year 1, 160,178 female and 353,092 male. Over the three years there was considerable increase in number of female participants, a rise of 15,646, compared to a decrease of 13,397 in male participants. The study shows that in year 1 (2016), women and girls in the male-dominated sports were most likely 'new' to sport and not transitioning from other sports. Of women and girls transitioning into male-dominated sports many came from playing the female-only sport. In all years, many women and girls transitioned from female-only sport to male-dominated sports, reflecting increased opportunity and choices. However, men and boys more likely to be retained. The female transition trends raise the need for further growth and development strategies by the female-only sport, but also capacity and gender issues for the male-dominated sports. More broadly, sport organisations should consider retention strategies across both genders and age groups, as male retention rates still remain higher than female retention rates, and there remains a large drop-off in participation during adolescence.

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Community sport; women and girls; retention; participation

Introduction

Sport is a predominant form of leisure-time physical activity with a wide variety of sports being played both nationally and internationally. However, participation in sport is neither consistent between sports nor across various demographic variables such as region, age and gender (Eime *et al*. 2016, 2018, Kokolakakis *et al*. 2017). Historically, women and girls have not been afforded the same opportunities as boys and men to be involved in sport and there has traditionally been, and still remains, vast gender inequality in sport (Spaaij *et al*. 2015, English 2017). Whilst this relates to various roles played in sport as a player, board member, chief executive officer, coach, or official (Burton 2015, Adriaanse 2016), the focus of this paper is on community-level players, those who play sport – the community 'sport participants'.

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Sport is widely understood to be organised around the discourses of hegemonic masculinity. Hegemonic masculinity relates to the way that ideas about gender are embedded within society. It is described as a practice that legitimises mens' dominant position in society and has historically played a central role in sport, partly due to the excessive focus on winning (English 2017). Further, societal norms have dictated which sports were deemed appropriate for participation by men and women (Pavlidis 2018, Glenn and King-Watkins 2020). Until a few decades ago, individual sports were deemed more appropriate for women and girls play as they did not involve bodily contact or applying force to a heavy object (Methany 1965). As a result, sports such as rugby, football and wrestling, were not considered suitable for women and girls, due to the aggression and force required to compete (Riemer and Visio 2003, Glenn and King-Watkins 2020). Some sports were/are considered gender specific. For example sports such as football and wrestling were supposed to be for men and boys, sports such as aerobics and gymnastics were deemed more appropriate for women and girls. Other sports, such as basketball, golf, soccer and tennis, came to be deemed suitable for both genders (Riemer and Visio 2003).

The game of netball was designed specifically for women and girls and originated from the sport of basketball (Eime and Stewart 2018). As such the game of basketball was modified to accommodate gendered social standards regarding female participation in sport. At the time, in 1891 women's' dress conventions of ankle length skirts and wrist length shirts hindered their physical movements, which meant that playing basketball with dribbling and throwing long passes was difficult. Therefore, changes were made so that women and girls could play within accepted feminine cultural practices such as accepted conventions of clothing attire. These rule changes included dividing the court into three zones, increasing the number of players, and using a smaller ball. Further, netball was an alternative to womens' field hockey and was perceived as an ideal female game as it did not require excessive strength, aggression or physical exertion. It was also thought that netball was not overly competitive, and was played with a cooperative and 'ladylike' spirit which reflected the accepted notion of femininity of the time (Eime and Stewart 2018).

Although there have been developments for societal acceptance of women and girls playing a wider variety of sports, there still remain beliefs that whilst some sports are now considered gender neutral or acceptable for women and girls to play, that does not necessarily mean that women and girls are socially accepted when they choose to play so-called masculine sports (Oxford and McLachlan 2018, Zipp *et al*. 2019, Fowlie, Fowlie *et al*. 2021).

The development of cultural and societal acceptance of women and girls playing sport varies widely across the globe. For example, until very recently, Iranian women and girls were not allowed to attend sporting events, and even today their attendance remains limited (Bureau 2015, Evans 2019). Women and girls were allowed to attend a World Cup qualifier (football) in Iran, but only in response to pressure by a woman setting herself on fire protesting against her arrest for trying to get into a match as a spectator (Evans 2019). In other countries women and girls are allowed to play sports, but in some countries like Samoa, cultural norms still restrict what sports they can play, with rugby not allowed for women and girls (Thorp 2014).

Countries such as Sweden, Finland, Norway, New Zealand, the United Kingdom and Australia are further advanced in terms of gender equality in sport participation, with a range of gender equality frameworks, investments and policies which have resulted in opportunities for women and girls to play the sport of their choice (Sport England 2016, Ministry of Education and Culture 2018, Council of Europe 2019). In Australia, various levels of government and other sport and health agencies have developed and implemented a range of gender equality strategies, policies and investments (Australian Government Department of Health 2017, VicHealth. 2017, NSW Government 2019). For example, Sport England developed the 'This Girl Can' initiative which has been adopted in Australia (VicHealth and Latrobe University 2020). The campaign was designed to inspire, energise and empower women to be more active regardless of their ethnicity, size or sporting ability (VicHealth

and Latrobe University 2020). In the State of Victoria in Australia, the 'Change our Game' initiative has also been developed which aims to 'level the playing field for women and girls in sport and active recreation' (Victoria State Government undated).

Recent research in Australia and abroad highlights the gender inequality in sport participation rates, with boys and men participating at much higher rates than women and girls (Eime *et al*. 2016, 2018, 2019a, Luiggi *et al*. 2018, Strandbu *et al*. 2019, Shull *et al*. 2020). Luiggi *et al*. (2018) conducted surveys with adolescent students (n = 3218, aged 16 years) in France, and reported that only 57% of girls reported playing sport, compared to 78% of boys (Luiggi *et al*. 2018). In Australia, a longitudinal study involving all registered club participants (n = 844,992) in 10 major sports across the state of Victoria reported overall population participation rates of 10% for women and girls and 17% for boys and men, aged 5–100 (Eime *et al*. 2020). This study also reported that the largest differences in participation rates by gender were for the 5–9 and the 10–14 year age groups. For ages 5–9 years, 63% of boys played sport compared to only 45% of girls, and for ages 10–14 74% of boys played sport compared to 55% of girls (Eime *et al*. 2020).

Studies show that there are many barriers to participation in sport for women and girls (Sport Scotland 2008). These included practical barriers, personal barriers, and social and cultural barriers. Practical barriers include the lack of time/childcare, lack of money, lack of transport, personal safety, less funding than male sport, and access to female friendly facilities. In regard to personal barriers, issues included body image, type and cost of clothing and equipment, lack of self-confidence and parental and adult influence (Sport Scotland 2008). And in regard to social and cultural barriers, the list seems the longest. These barriers include male domination of sport culture in general, attitudes and prejudices about sexuality, disability, ethnicity, sexual harassment and abuse, female invisibility in media representation of sport, and lack of female role models.

These barriers to some extent explain why marketeers for decades have overlooked or underestimated the commercial attraction of the female elite sport platform. Barriers such as male dominated sport (governance) culture and poor media representation of female elite sport may have led to an unfounded assumption that consumers (men and women) were not interested in playing and watching professional/elite level female sport. As noted, women and girls have faced and continue to face more barriers to participation in sport and physical activity than men and boys (Oxford and McLachlan 2018, Portela-Pino, López-Castedo et al. 2020) and with fewer women and girls playing, their representation in elite sport also suffers. And whilst the barriers include individual, organisational and environmental barriers, the societal and cultural barriers to partichttps://federation.edu.au/libraryipation in sport remain significant (Oxford and McLachlan 2018, Hanlon *et al*. 2019, Fowlie, Fowlie *et al*. 2021).

In recent times there has been an increase in female participation in sport and this is also reflected in the media coverage of emerging and expanding professional sporting leagues for women and girls which is slowly correcting this gender imbalance (English *et al*. 2019). Women and girls are still marginalised in sports media coverage (English *et al*. 2019). However, the question remains, why did it take so long for a wide range of sport and media decision makers to realise the potential of properly providing for and marketing sport to women and girls? The overriding popular argument is summarised by Symons *et al*. (2021) and remains an economic one – where those who run media outlets assume that media consumers (supposedly) are less interested in viewing female sport, hence the value of media and commercial rights is lower, which in turn impacts the ability to pay female athletes equal to their male counterparts. With less or lower quality media coverage there is less exposure, fewer role models and hence, the vicious circle continues. As a matter of fact, Symons *et al*. (2021) conclude that 'the major contribution of this study is its demonstration that the ongoing dominance of men's sport media coverage does not emerge as a result of weekly, seasonal coverage of live sport, but is founded on deeply entrenched notions of commercial value and upheld by newsroom work routines and social rituals' (Symons *et al*. 2021).

It remains to be seen if the creation of professional sporting leagues for women and girls has started to break this cycle, leading to changes in sporting culture and broader societal attitudes about women and girls' participation in sport. If nothing else, the new leagues have resulted in sport policy development, strategies and investments aimed at increasing representation of women and girls throughout sport.

This study focuses on participation in community club-based sport. Over the past decade in Australia, there has been an increase in opportunities for women and girls to play sports that were traditionally male-only or male-dominated, for example sports such as cricket and Australian football. The competitions are still gendered in that women and girls play together and not with boys and men. However, it is not clear whether these increased opportunities for women and girls to play 'all sports' now results in new people coming into sport, the same participants playing multiple sports, or the same participants transitioning into traditionally male-dominated sports from other sports. Therefore, we are seeking to investigate whether the new opportunities for women and girls to play traditionally male-dominated sports actually increases overall participation numbers of women and girls playing community club-based sport. The primary aim of this study is to investigate the changing sport participation trends of women and girls, and in particular the increasing rates of participation in traditionally male-dominated sports in the Australian state of Victoria. The secondary aim was to provide a comparative analysis of sport participation rates and patterns of men and boys.

Methods

In this study an innovative approach to the tracking of transitions of individuals from one sport to another was made possible by the research team having access to a comprehensive database of annual membership registration data from the state sporting associations (SSAs) that administer five of the most popular community/club-based sporting codes in the Australian State of Victoria. This study investigated the registration history of all female and male players under the age of 30 registered in these five popular Victorian sports over a 3-year period. The methods for this study have been approved by Federation University Human Research Ethics Committee.

To illuminate the motivation for our approach, it is worth briefly considering the more conventional approach of conducting a sample survey of players, in which survey respondents directly report their sport participation histories and transitions. Well documented problems of this approach include the logistics and associated expense of gaining access to the relevant segment of the population and the difficulty of recruiting a representative sample of respondents. The response rate is likely to be low, and unless resources are sufficient to conduct such a survey at large scale, the sample size is likely to be moderate at best, and as a consequence the sampling error is likely to result in large ranges of uncertainty for estimates of transition counts. This uncertainty is likely to be exacerbated by non-sampling errors (biases) due to unrepresentativeness and particularly by self-selection bias. Furthermore, surveys involving minors require protocols for consent to be given by guardians, which constitutes another barrier to comprehensive data collection.

In comparison, advantages of our 'census' approach include: low cost; no recruitment issues; a large dataset comprising a near-complete enumeration (census) of the players of each sport in each year; very little sampling error or representation bias (limited to that caused by missing, incomplete or inaccurate organisational records); and no reliance on retrospective self-reporting. The countervailing disadvantage or limitation is that there is no direct information about transitions; records for an individual cannot be linked across sports, because privacy and confidentiality considerations require that the data made available by the primary custodians (the SSAs) is anonymised. Consequently, while an individual can be tracked longitudinally within one sport using the unique member ID issued by the SSA, the records from different sports cannot be directly linked. Given the comprehensive scope of the datasets the statistical analysis was descriptive rather than inferential. STATA software was used for analysis and table-building.

To overcome this limitation, numbers of transitions between sports were instead estimated using demographic matching; registrations in different sports with the same date of birth (DOB), sex and residential postcode (PC) were assumed to be the same person. In the small proportion of cases where there were multiple instances of the same combination of DOB, sex and PC within a sport, only the first instance of the combination was used for matching players across sports. This procedure results in a small over-estimation of transition counts, due to different individuals in different sports who are matched on all three characteristics being regarded as one person. This method has been described in more detail elsewhere (Eime *et al*. 2020).

The sports required that they remain anonymous in terms of identification of their individual sports data and results. Therefore, the five sports have been coded as follows, on the basis of the proportion of male participants in the study population in the first year of the study (2016):

- Three male-dominated sports: Male1, Male2, Male3 (92%, 93%, 81% respectively)
- One relatively gender-neutral sport: Neutral1 (67%)
- One female-dominated sport: Female1 (3%)

Given that our central aim was to investigate female transition into traditionally male-dominated sports, our analysis is structured with a focus on transitions INTO each of the five sports. Each pair of columns in Tables 1 and 2 summarises the transitions into a particular sport. We refer to this sport as the 'target' sport. For each of three study years (2016, 2017 and 2018), participants in each target sport were tracked retrospectively to determine their playing history across all five sports (the target sport and the other four sports, termed 'feeder sports') in the previous year. Players new to the group of five sports were also identified; these were players who did not play any of the five sports in the previous year. For each sport in each study year, the outcomes were the numbers of players who: continued in the target sport; transitioned from the other four feeder sports; or commenced in the target spot but did not transition from any of the four feeder sports. Each of these numbers was expressed as a percentage of players in the target sport in the study year. We also note that because our analysis is focused on transitions INTO each of the five sports, those who transitioned OUT OF the group of five sports altogether were outside the scope of the analysis and are not shown in Tables 1 and 2.

Results

In 2016 across the 5 sports there were 513,270 participants with 160,178 women and girls and 353,092 men and boys. This increased slightly to 515,519 in 2018. There was a considerable increase in female participation, a rise of 15,646 compared to a decrease of 13,397 in male participation.

The results of the analysis of transitions are shown in Table 1 (female players) and Table 2 (male players).

In each table, for each year, the number of transitions into each sport (rows 2–7) is expressed as a percentage of the number of players of the sport (row 1). Because some players transition from more than one of the other sports in the previous year, the total number of transitions (row 12) is greater than the number of players, and so the corresponding percentage is greater than 100%.

The three rows of total numbers of transitions for each sport (rows 8, 10, 12) are each summed across the table, with the total number of transitions for all five sports being shown in the final column of the table. The percentages in the following rows (rows 9, 11, 13) are percentages of these totals.

For female players the key features of the 2016 transition data were that the Female1 and Neutral1 sports had the highest number of female players. For two of the Male-dominated sports, Male1 and Male2, nearly half of the female players were new to sport, i.e. they were not players of any of the five sports in the previous year. The next highest proportions of participants in these sports were players retained from 2015. For Male3, the Neutral and Female1 sports, players retained from

Table 1. Estimated[1] numbers of transitions between five major sports[2]: female players aged 4-29, Victoria, 2016-2018

Row	Transitions (in current year) to ————————————>	Male1[2]		Male2[2]		Male3[2]		Neutral1[2]		Female1[2]		Total
		n	3%	n	3%	n	3%	n	3%	n	3%	transitions
	2016 season											
1	Total female players	11,974		4,620		11,657		47,358		84,569		
	Transitions from (in previous year: 2015)											
2	Male1	3,930	32.8	331	7.2	156	1.3	1,357	2.9	1,640	1.9	
3	Male2	410	3.4	1,522	32.9	176	1.5	442	0.9	948	1.1	
4	Male3	198	1.7	143	3.1	6,258	53.7	879	1.9	1,133	1.3	
5	Neutral1	1,586	13.2	434	9.4	912	7.8	23,631	49.9	8,315	9.8	
6	Female1	1,991	16.6	873	18.9	1,232	10.6	8,504	18	54,899	64.9	
7	None of the 5 sports (new players)	5,823	48.6	2,238	48.4	4,395	37.7	18,996	40.1	26,243	31	
8	**Transitions from 4 sports (excluding retention)[4]**	4,185	35	1,781	38.5	2,476	21.2	11,182	23.6	12,036	14.2	31,660
9	% of all transitions from 4 other sports[4]		13.2		5.6		7.8		35.3		38	100
10	**Transitions from 5 sports (including retention)[4]**	8,115	67.8	3,303	71.5	8,734	74.9	34,813	73.5	66,935	79.1	1,21,900
11	% of all transitions from all 5 sports[4]		6.7		2.7		7.2		28.6		54.9	100
12	**Transitions from 5 sports and new players[3,4]**	13,938	116.4	5,541	119.9	13,129	112.6	53,809	113.6	93,178	110.2	1,79,595
13	% of all transitions from 5 sports and new players[4]		7.8		3.1		7.3		30		51.9	100
	2017 season											
1	Total female players	23,296		5,320		11,959		49,424		84,184		
	Transitions from (in previous year: 2016)											
2	Male1	6,122	26.3	453	8.5	224	1.9	1,941	3.9	2,256	2.7	
3	Male2	746	3.2	1,983	37.3	186	1.6	591	1.2	1,162	1.4	
4	Male3	483	2.1	196	3.7	6,966	58.2	1,060	2.1	1,374	1.6	
5	Neutral1	3,933	16.9	550	10.3	999	8.4	31,058	62.8	9,689	11.5	
6	Female1	4,953	21.3	1,062	20.0	1,342	11.2	9,230	18.7	56,147	66.7	
7	None of the 5 sports (new players)	11,034	47.4	2,380	44.7	4,033	33.7	14,515	29.4	24,181	28.7	
8	**Transitions from 4 sports (excluding retention)[4]**	10,115	43.4	2,261	42.5	2,751	23	12,822	25.9	14,481	17.2	42,430
9	% of all transitions from 4 other sports[4]		23.8		5.3		6.5		30.2		34.1	100
10	**Transitions from 5 sports (including retention)[4]**	16,237	69.7	4,244	79.8	9,717	81.3	43,880	88.8	70,628	83.9	1,44,706
11	% of all transitions from all 5 sports[4]		11.2		2.9		6.7		30.3		48.8	100
12	**Transitions from 5 sports and new players[3,4]**	27,271	117.1	6,624	124.5	13,750	115	58,395	118.2	94,809	112.6	2,00,849
13	% of all transitions from 5 sports and new players[4]		13.6		3.3		6.8		29.1		47.2	100

(*Continued*)

Table 1. (Continued).

Row	Transitions (in current year) to ————————————>	Male1[2]		Male2[2]		Male3[2]		Neutral1[2]		Female1[2]		Total transitions
		n	3%	n	3%	n	3%	n	3%	n	3%	
	2018 season											
1	Total female players	28,148		4,362		12,509		48,082		82,723		
	Transitions from (in previous year: 2017)											
2	Male1	12,551	44.6	579	13.3	411	3.3	3,791	7.9	4,859	5.9	
3	Male2	965	3.4	2,122	48.6	200	1.6	633	1.3	1,309	1.6	
4	Male3	499	1.8	189	4.3	4,800	38.4	1,005	2.1	1,394	1.7	
5	Neutral1	5,118	18.2	559	12.8	956	7.6	28,626	59.5	10,072	12.2	
6	Female1	5,963	21.2	1,050	24.1	1,295	10.4	8,633	18	55,892	67.6	
7	None of the 5 sports (new players)	10,588	37.6	1,435	32.9	6,300	50.4	15,303	31.8	22,393	27.1	
8	**Transitions from 4 sports (excluding retention)[4]**	12,545	44.6	2,377	54.5	2,862	22.9	14,062	29.2	17,634	21.3	49,480
9	% of all transitions from 4 other sports[4]		25.4		4.8		5.8		28.4		35.6	100
10	**Transitions from 5 sports (including retention)[4]**	25,096	89.2	4,499	103.1	7,662	61.3	42,688	88.8	73,526	88.9	1,53,471
11	% of all transitions from all 5 sports[4]		16.4		2.9		5		27.8		47.9	100
12	**Transitions from 5 sports and new players[3,4]**	35,684	126.8	5,934	136	13,962	111.6	57,991	120.6	95,919	116	2,09,490
13	% of all transitions from 5 sports and new players[4]		17		2.8		6.7		27.7		45.8	100
	Change: 2016 season to 2018 season [5]											
1	Total female players[6]	16,174	135.1	-258	-5.6	852	7.3	724	1.5	-1,846	-2.2	
	Transitions from (in previous year - 2015 or 2017)											
2	Male1	8,621	11.8	248	6.1	255	1.9	2,434	5	3,219	3.9	
3	Male2	555	0	600	15.7	24	0.1	191	0.4	361	0.5	
4	Male3	301	0.1	46	1.2	-1,458	-15.3	126	0.2	261	0.3	
5	Neutral1	3,532	4.9	125	3.4	44	-0.2	4,995	9.6	1,757	2.3	
6	Female1	3,972	4.6	177	5.2	63	-0.2	129	0	993	2.6	
7	None of the 5 sports (new players)	4,765	-11	-803	-15.5	1,905	12.7	-3,693	-8.3	-3,850	-4	
8	**Transitions from 4 sports (excluding retention)[4]**	8,360	9.6	596	15.9	386	1.6	2,880	5.6	5,598	7.1	17,820

(*Continued*)

Table 1. (Continued).

9	% of all transitions from 4 other sports[4]		12.1		-0.8		-2		-6.9		-2.4	
10	**Transitions from 5 sports (including retention)[4]**	16,981	21.4	1,196	31.6	-1,072	-13.7	7,875	15.3	6,591	9.7	31,571
11	% of all transitions from all 5 sports[4]		9.7		0.2		-2.2		-0.7		-7	
12	**Transitions from 5 sports and new players[3,4]**	21,746	10.4	393	16.1	833	-1	4,182	7	2,741	5.8	29,895
13	% of all transitions from 5 sports and new players[4]		9.3		-0.3		-0.6		-2.3		-6.1	

[1]The registration data supplied by SSAs are de-identified for privacy/confidentiality, and consequently it is not possible to directly link individuals' registrations in different sports. Numbers of transitions between sports are estimated using demographic matching; registrations with the same date of birth, sex & residential postcode are assumed to be the same person. This results in a small over-estimation of transition counts, due to different individuals who are matched on all three characteristics being regarded as one person.
[2]The five sports are de-identified and designated according to the sex of the majority of participants.
[3]With three exceptions (see Note 4), the number of transitions is expressed as a percentage of the number of players (Row 1). Because some players transition from more than one of the other sports in the previous year, the total number of transitions (Row 12) is greater than the number of players, and so the corresponding percentage is greater than 100%.
[4]The three rows of total numbers of transitions for each sport (Rows 8, 10, 12) are each summed across the table, with the total number of transitions for all five sports being shown in the final column of the table. The percentages in the following rows (Rows 9, 11, 13) are percentages of these totals.
[5]The change section shows: changes in numbers of transitions = number in 2018 – number in 2016; and changes in percentages = percentage in 2018 – percentage in 2016.
[6]The percentages in this row are the percentage change in the total number of players from 2016 to 2018.

Table 2. Estimated[1] numbers of transitions between five major sports[2]: male players aged 4-29, Victoria, 2016-2018

Row	Transitions (in current year) to ————————————>	Male1[2]		Male2[2]		Male3[2]		Neutral1[2]		Female1[2]		Total
		n	3%	n	3%	n	3%	n	3%	n	3%	transitions
	2016 season											
1	Total male players	1,42,509		64,741		48,697		94,831		2,314		
	Transitions from (in previous year: 2015)											
2	Male1	92,782	65.1	21,935	33.9	6,799	14	28,102	29.6	624	27.0	
3	Male2	26,067	18.3	41,496	64.1	5,264	10.8	11,074	11.7	294	12.7	
4	Male3	5,463	3.8	4,089	6.3	28,946	59.4	5,289	5.6	116	5.0	
5	Neutral1	22,748	16	7,731	11.9	4,754	9.8	45,062	47.5	402	17.4	
6	Female1	598	0.4	257	0.4	93	0.2	385	0.4	805	34.8	
7	None of the 5 sports (new players)	37,676	26.4	15,542	24.0	13,876	28.5	32,204	34.0	815	35.2	
8	**Transitions from 4 sports (excluding retention)[4]**	54,876	38.5	34,012	52.5	16,910	34.7	44,850	47.3	1,436	62.1	1,52,084
9	% of all transitions from 4 other sports[4]		36.1		22.4		11.1		29.5		0.9	100
10	**Transitions from 5 sports (including retention)[4]**	1,47,658	103.6	75,508	116.6	45,856	94.2	89,912	94.8	2,241	96.8	3,61,175
11	% of all transitions from all 5 sports[4]		40.9		20.9		12.7		24.9		0.6	100
12	**Transitions from 5 sports and new players[3,4]**	1,85,334	130.1	91,050	140.6	59,732	122.7	1,22,116	128.8	3,056	132.1	4,61,288
13	% of all transitions from 5 sports and new players[4]		40.2		19.7		12.9		26.5		0.7	100
	2017 season											
1	Total male players	1,40,834		62,376		47,306		1,02,241		2,562		
	Transitions from (in previous year: 2016)											
2	Male1	94,460	67.1	22,756	36.5	6,463	13.7	31,546	30.9	728	28.4	
3	Male2	24,012	17.0	39,962	64.1	4,737	10.	10,788	10.6	323	12.6	
4	Male3	6,057	4.3	4,320	6.9	30,370	64.2	6,424	6.3	126	4.9	
5	Neutral1	28,524	20.3	9,203	14.8	5,520	11.7	62,560	61.2	535	20.9	
6	Female1	660	0.5	262	0.4	111	0.2	462	0.5	843	32.9	
7	None of the 5 sports (new players)	35,255	25.0	14,463	23.2	12,070	25.5	25,856	25.3	903	35.2	
8	**Transitions from 4 sports (excluding retention)[4]**	59,253	42.1	36,541	58.6	16,831	35.6	49,220	48.1	1,712	66.8	1,63,557
9	% of all transitions from 4 other sports[4]		36.2		22.3		10.3		30.1		1	100
10	**Transitions from 5 sports (including retention)[4]**	1,53,713	109.1	76,503	122.6	47,201	99.8	1,11,780	109.3	2,555	99.7	3,91,752
11	% of all transitions from all 5 sports[4]		39.2		19.5		12		28.5		0.7	100
12	**Transitions from 5 sports and new players[3,4]**	1,88,968	134.2	90,966	145.8	59,271	125.3	1,37,636	134.6	3,458	135	4,80,299
13	% of all transitions from 5 sports and new players[4]		39.3		18.9		12.3		28.7		0.7	100

(*Continued*)

Table 2. (Continued).

Row	Transitions (in current year) to ————————————>	Male1[2]		Male2[2]		Male3[2]		Neutral1[2]		Female1[2]		Total
		n	3%	n	3%	n	3%	n	3%	n	3%	transitions
	2018 season											
1	Total male players	1,39,362		50,657		43,980		1,03,123		2,573		
	Transitions from (in previous year: 2017)											
2	Male1	93,725	67.3	18,497	36.5	6,254	14.2	31,691	30.7	848	33	
3	Male2	23,300	16.7	34,444	68	4,009	9.1	10,386	10.1	328	12.7	
4	Male3	5,845	4.2	3,479	6.9	19,270	43.8	6,146	6	164	6.4	
5	Neutral1	30,120	21.6	8,351	16.5	4,772	10.9	60,372	58.5	569	22.1	
6	Female1	722	0.5	286	0.6	99	0.2	528	0.5	915	35.6	
7	None of the 5 sports (new players)	34,773	25	10,340	20.4	18,355	41.7	28,429	27.6	770	29.9	
8	**Transitions from 4 sports (excluding retention)[4]**	59,987	43	30,613	60.4	15,134	34.4	48,751	47.3	1,909	74.2	1,56,394
9	% of all transitions from 4 other sports[4]		38.4		19.6		9.7		31.2		1.2	100
10	**Transitions from 5 sports (including retention)[4]**	1,53,712	110.3	65,057	128.4	34,404	78.2	1,09,123	105.8	2,824	109.8	3,65,120
11	% of all transitions from all 5 sports[4]		42.1		17.8		9.4		29.9		0.8	100
12	**Transitions from 5 sports and new players[3,4]**	1,88,485	135.2	75,397	148.8	52,759	120	1,37,552	133.4	3,594	139.7	4,57,787
13	% of all transitions from 5 sports and new players[4]		41.2		16.5		11.5		30		0.8	100
	Change: 2016 season to 2018 season [5]											
1	Total male players[6]	-3,147	-2.2	-14,084	-21.8	-4,717	-9.7	8,292	8.7	259	0.11	
	Transitions from (in previous year - 2015 or 2017)											
2	Male1	943	2.1	-3,438	2.6	-545	0.3	3,589	1.1	224	6	
3	Male2	-2,767	-1.6	-7,052	3.9	-1,255	-1.7	-688	-1.6	34	0	
4	Male3	382	0.4	-610	0.6	-9,676	-15.6	857	0.4	48	1.4	
5	Neutral1	7,372	5.7	620	4.5	18	1.1	15,310	11	167	4.7	
6	Female1	124	0.1	29	0.2	6	0	143	0.1	110	0.8	
7	None of the 5 sports (new players)	-2,903	-1.5	-5,202	-3.6	4,479	13.2	-3,775	-6.4	-45	-5.3	
8	**Transitions from 4 sports (excluding retention)[4]**	5,111	4.5	-3,399	7.9	-1,776	-0.3	3,901	0	473	12.1	4,310
9	% of all transitions from 4 other sports[4]		2.3		-2.8		-1.4		1.7		0.3	
10	**Transitions from 5 sports (including retention)[4]**	6,054	6.7	-10,451	11.8	-11,452	-15.9	19,211	11	583	12.9	3,945
11	% of all transitions from all 5 sports[4]		1.2		-3.1		-3.3		5		0.2	
12	**Transitions from 5 sports and new players[4]**	3,151	5.2	-15,653	8.2	-6,973	-2.7	15,436	4.6	538	7.6	-3,501
13	% of all transitions from 5 sports and new players[3,4]		1		-3.3		-1.4		3.6		0.1	

[1]The registration data supplied by SSAs are de-identified for privacy/confidentiality, and consequently it is not possible to directly link individuals' registrations in different sports. Numbers of transitions between sports are estimated using demographic matching; registrations with the same date of birth, sex & residential postcode are assumed to be the same person. This results in a small over-estimation of transition counts, due to different individuals who are matched on all three characteristics being regarded as one person.

[2]The five sports are de-identified and designated according to the sex of the majority of participants.

[3]With three exceptions (see Note 4), the number of transitions is expressed as a percentage of the number of players (Row 1). Because some players transition from more than one of the other sports in the previous year, the total number of transitions (Row 12) is greater than the number of players, and so the corresponding percentage is greater than 100%.

[4]The three rows of total numbers of transitions for each sport (Rows 8, 10, 12) are each summed across the table, with the total number of transitions for all five sports being shown in the final column of the table. The percentages in the following rows (Rows 9, 11, 13) are percentages of these totals.

[5]The change section shows: changes in numbers of transitions = number in 2018 – number in 2016; and changes in percentages = percentage in 2018 – percentage in 2016.

[6]The percentages in this row are the percentage change in the total number of players from 2016 to 2018.

Table 3. Registered members of five major sports[1] aged 4-29 years, Victoria, 2016-2018: age profiles by gender

	Female										Male									
Age	**Male1[1]**		**Male2[1]**		**Male3[1]**		**Neutral1[1]**		**Female1[1]**		**Male1[1]**		**Male2[1]**		**Male3[1]**		**Neutral1[1]**		**Female1[1]**	
(years)	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
2016																				
4	824	6.9	234	5.1	119	1.0	359	0.8	502	0.6	5,610	3.9	1,476	2.3	591	1.2	822	0.9	12	0.5
5-9	4,419	36.9	1,934	41.9	3,084	26.5	14,200	30.0	20,786	24.6	45,565	32.0	16,545	25.6	16,128	33.1	26,279	27.7	426	18.4
10-14	3,710	31.0	1,543	33.4	4,713	40.4	17,874	37.7	32,602	38.6	38,735	27.2	19,033	29.4	18,334	37.6	32,306	34.1	543	23.5
15-19	1,925	16.1	471	10.2	2,062	17.7	7,952	16.8	17,071	20.2	25,482	17.9	10,773	16.6	7,210	14.8	17,419	18.4	567	24.5
20-24	697	5.8	264	5.7	1,100	9.4	4,240	9.0	8,167	9.7	16,110	11.3	9,039	14.0	3,695	7.6	10,713	11.3	455	19.7
25-29	399	3.3	174	3.8	579	5.0	2,733	5.8	5,441	6.4	11,007	7.7	7,875	12.2	2,739	5.6	7,292	7.7	311	13.4
Total	11,974	100	4,620	100	11,657	100	47,358	100	84,569	100	142,509	100	64,741	100	48,697	100	94,831	100	2,314	100
2017																				
4	1,096	4.7	225	4.2	94	0.8	368	0.7	454	0.5	5,640	4.0	1,330	2.1	481	1.0	789	0.8	15	0.6
5-9	6,631	28.5	2,035	38.3	3,027	25.3	14,570	29.5	20,040	23.8	44,843	31.8	15,959	25.6	14,584	30.8	27,295	26.7	494	19.3
10-14	8,206	35.2	2,000	37.6	5,012	41.9	18,635	37.7	32,953	39.1	38,121	27.1	18,389	29.5	18,548	39.2	34,801	34.0	644	25.1
15-19	4,284	18.4	528	9.9	2,039	17.0	8,363	16.9	16,785	19.9	25,034	17.8	10,352	16.6	7,196	15.2	19,357	18.9	506	19.8
20-24	1,961	8.4	308	5.8	1,148	9.6	4,404	8.9	8,320	9.9	15,980	11.3	8,644	13.9	3,728	7.9	11,915	11.7	541	21.1
25-29	1,118	4.8	224	4.2	639	5.3	3,084	6.2	5,632	6.7	11,216	8.0	7,702	12.3	2,769	5.9	8,084	7.9	362	14.1
Total	23,296	100	5,320	100	11,959	100	49,424	100	84,184	100	140,834	100	62,376	100	47,306	100	102,241	100	2,562	100
2018																				
4	1,261	4.5	67	1.5	254	2.0	351	0.7	448	0.5	5,813	4.2	277	0.5	1,243	2.8	893	0.9	12	0.5
5-9	7,338	26.1	906	20.8	4,198	33.6	14,760	30.7	19,213	23.2	44,157	31.7	8,084	16.0	18,137	41.2	27,933	27.1	470	18.3
10-14	10,233	36.4	2,090	47.9	4,626	37.0	18,285	38.0	32,682	39.5	38,070	27.3	16,604	32.8	13,915	31.6	35,397	34.3	671	26.1
15-19	5,193	18.4	656	15.0	1,594	12.7	7,618	15.8	16,605	20.1	24,849	17.8	9,711	19.2	4,712	10.7	19,094	18.5	599	23.3
20-24	2,573	9.1	349	8.0	1,155	9.2	4,068	8.5	8,215	9.9	15,318	11.0	8,345	16.5	3,378	7.7	11,711	11.4	487	18.9
25-29	1,550	5.5	294	6.7	682	5.5	3,000	6.2	5,560	6.7	11,155	8.0	7,636	15.1	2,595	5.9	8,095	7.8	334	13.0
Total	28,148	100	4,362	100	12,509	100	48,082	100	82,723	100	139,362	100	50,657	100	43,980	100	103,123	100	2,573	100

[1]The five sports are de-identified and designated according to the sex of the majority of participants.

Note: The age profiles each have a flattened peak spanning two 5-year age cohorts (shaded). All peaks range from 5 to 14 years, with exception of male netballers, for whom the peaks range from 10 to 19 years.

the previous year predominated, followed by new players. The proportions of women and girls in male-dominated and neutral sports in 2016 who transitioned from the Female1 sport in 2015 ranged from 10.6% to 18.9%.

The patterns of transition in 2018 remained broadly similar to those of 2016, but there were some differences in the detail. For all sports, the inward transitions were mainly from the Female1 and Neutral sports, and the proportions generally remained similar to previous years, but were higher for transitions from Female1 into the two male-dominated sports (21.2% and 24.1%). For the Female1 and Neutral sports there were very similar proportions of new players in 2018 compared to 2016. For Male3 the proportion of new players rose whilst the proportion of retained players dropped considerably (15 percentage points) from 2016 to 2018. All other sports had higher proportions of retained players in 2018 compared to 2016.

Overall, a substantial number of women and girls have transitioned from the Female1 sport into the male-dominated sports and/or the neutral sport. Further, a substantial number of women and girls have been retained in the new sport in subsequent years, with retained players into the two most male-dominated sports representing an increasing proportion of all players in 2018 compared to 2016.

Compared to the female transition patterns, men and boys (Table 2) were less likely to be new to sport in both 2016 and 2018. They were also much more likely than women and girls to be retained in all of the male-dominated sports, but not in the neutral or female-dominated sports, in both 2016 and 2018.

The age profile of players (Table 3) shows that the peak age of participation across each sport and gender was clearly 5–14 years which represented 60–70% of all participants with the exception of male players in the Female1 sport, where the age distribution was spread more widely into the older age ranges. The proportion of younger players (4–9 years) was higher in 2018 for Male3, however for Male1 and Male2 the proportion of young players was higher in 2016, which aligns with a higher proportion of players in these sports being retained in subsequent years.

Discussion

This study provides unique details of sport participation patterns across time (3 years) and across sports with a large study sample of over 500,000 sport participants across 5 major Australian sports.

There are five main points to highlight. Firstly, female participation increased considerably over the 3 years (by more than 15,000), whereas participation for men and boys decreased with more than 13,000 fewer participants. It is positive that female participation has increased substantially over a relatively short period. It would seem that the policy, strategies and investments for female participation in sport and the subsequent opportunities for women and girls to play traditionally male-dominated sports has increased demand for women and girls to play those sports (Casey *et al*. 2019). In the context of the Australian sporting landscape, this also has to be seen against the backdrop of significant media exposure for the newly established professional leagues for females in cricket and Australian football. Understanding why participation of men and boys is decreasing requires further attention.

Secondly, it is clear that women and girls in the male-dominated sports in 2016 were most likely 'new' to sport and not transitioning or 'code-hopping' from other sports within this dataset. This may relate to a sense of empowerment that the newfound opportunity to use the male-dominated sport context as a platform to resist gendered stereotypes provides. Many of these players were retained in these sports over the 3 years. It is positive to see that retention of women and girls in two male-dominated sports increased from around 33% in 2016 to 45–49% in 2018. There are many reasons why women choose to play male-dominated sports and keep playing these sports, but in doing so they also need to link their participation to their sense of identity and their sense of belonging in the sporting context (Oxford and McLachlan 2018, Fernandez-Lasa *et al*. 2020). Whilst women and girls are increasingly playing male-dominated sports there are still many barriers to overcome (Oxford and

McLachlan 2018, Bevan *et al*. 2020, Fernandez-Lasa *et al*. 2020, Portela-Pino, López-Castedo et al. 2020). For example, in a recent Spanish study some women and girls stated that they felt 'different' when they played traditionally male-dominated sports, because of the dominance of male players and few female players (Fernandez-Lasa *et al*. 2020). Women playing male-dominated sports have an opportunity to resist gendered social norms and are provided with an escape from stereotypes – it (may) empower(s) women and girls to play sport on their terms (Fernandez-Lasa *et al*. 2020). Various studies have highlighted the need for family support and broader social support for women and girls in traditionally male-dominated sports (Bevan *et al*. 2020, Elliott, Elliott *et al*. 2020, Fernandez-Lasa *et al*. 2020). It is clear that parental support is very important for children and adolescents to be able to engage in specific sports (Elliott and Drummond 2017). A study of women and girls playing male-dominated sports discussed the issue of lack of family support, with a grandmother stating 'that's a boys sport, what are you doing?' (Bevan *et al*. 2020). An Australian study of girls playing Australian rules football noted that what attracted them to play male-dominated sport was a desire to play professionally, and this was often supported by their parents, including fathers (Elliott, Elliott *et al*. 2020).They also enjoyed the thrill-seeking of physically expressing themselves in a sport that required physical contact (Elliott, Elliott *et al*. 2020). The concept of an optimal club environment was also noted as important in that the clubs were warm, welcoming and friendly (Elliott, Elliott *et al*. 2020). It is worthwhile noting in that regard, that the capacity of the sports to cater for increased numbers on an ongoing basis may be limited (Eime *et al*. 2020). Literature that addresses female participation in male-dominated sports is limited, however a recent study reported that community-level sport faces challenges to accommodate growth of female participation (Eime *et al*. 2020). This relates to the capacity of clubs to provide infrastructure, playing space availability and volunteers willing and able to take on additional roles to support increased female participation (Eime *et al*. 2020).

Thirdly, women and girls in the female-dominated sport constituted a substantial proportion of those who transitioned into male-dominated sports or the neutral sport, and the proportions of these transitions within two of the male-dominated sports increased from 2016 to 2018. In 2018, 21% and 24% of female participants in the two most male-dominated sports came from the female-dominated sport in the previous year. There is some research to suggest that women enjoy some of the physicality of male-dominated sports. For example, a study of elite Canadian rugby players explored their experiences and many chose to play rugby due to the physicality and aggression and it being physically challenging (Kerr 2021). It was a sport suitable to their body type and it offered alternative social aspects with teammates and the rugby community, as well as being non-conformist. It is important that women and girls get to choose for themselves what sport they play, and without others providing negative input (Fernandez-Lasa *et al*. 2020). There is now more choice of activities for women and girls, and many are moving away from the female-only sports, but the long-term implications of this on female-only sports is unknown. Perhaps many women and girls like playing a sport that includes both boys and men as well as girls and women and there may be more family and social support for such sports. However further research is required to investigate this. It is known that parents often place greater value on sport for their sons than for their daughters (Heinze *et al*. 2017). This study found that the more progressive parents' gender role beliefs were, the more likely they were to have daughters who played stereotypically masculine sports (Heinze *et al*. 2017). Such cultural and social change leading to parents more willing for their daughters to play traditionally male-dominated sports in turn will lead to broader societal acceptance of women and girls playing these sports. In a recent study, the participants recognised that the sporting culture is shifting, with more accessibility and opportunities for women and girls than ever before; the three main factors for continued involvement identified were social connectedness, mentors within the club and media 'normalising' women in sport (Bevan *et al*. 2020).

Fourthly, compared to women and girls, men and boys were less likely to be 'new' to sport in both 2016 and 2018, and they were more likely to be retained than women and girls. The first point most likely relates to the fact that men and boys were historically more enabled to play these sports and that sport participation is higher amongst men and boys than women and girls, but the fact that men

and boys were more likely to be retained is something that requires further consideration. Why are the women and girls playing male-dominated sports less likely to be retained? The opportunities to play these sports are apparent, and there has been much sport policy directed towards these opportunities, for example by developing more female-friendly infrastructure (Australian Government Department of Health 2017, VicHealth. 2017, NSW Government 2019). Perhaps there are other factors that are related to skill and competency, social support, and club culture that hinder their continued participation. Research into women and girls playing cricket has highlighted that the adolescents often lack confidence in their cricket skills, and that there was an absence of pathway opportunities (Fowlie, Fowlie *et al*. 2021). These issues are beyond the scope of this paper, but future research may delve deeper into them. Other barriers, such as having to play with men and boys because of a lack of female-only competitions which Fowlie et al. identified in cricket (Fowlie, Fowlie *et al*. 2021), have now largely been eliminated. A recent study of women and girls playing Australian rules football stated that for retention, the girls needed to take an active role in trying to grow the game (Elliott, Elliott *et al*. 2020). Another Australian study of women and girls playing male-dominated sports also articulated the importance of young women mentoring girls new to the sport and providing support for their colleagues and peers (Bevan *et al*. 2020).

Lastly, the age profiles of participants clearly show that sport participation is highly dominated by children and young adolescents, with 60–70% of sport participants aged between 5–14 years. Whilst sport participation is often depicted as a life-long activity, and whilst there are sports that cater for older adults specifically, the dominant representation of children in sport is a consistent finding (Eime *et al*. 2016, 2021). Many studies report that participation is highest for children, before declining rapidly towards late adolescence (Woods *et al*. 2018, Eime *et al*. 2019b, Shull *et al*. 2020). The unique census-based methodology of the present study demonstrates a consistent participation peak within a 10-year age range across five sports, more clearly than is possible with survey-based methodology. The significant decline in participation specifically from 15–19 years has been previously highlighted (Eime *et al*. 2019b). In the context of this study, it is critical to note that retention of women and girls continues to be lower than that of men and boys, which should become another focus for sport policy makers. Retention is important so that individuals continue to benefit from the physical, mental and social health benefits of participation in community sport. It is fair to assume that on the back of increasing opportunities for women and girls to play sport and an activewear driven move towards becoming physically more active (O'Sullivan *et al*. 2017) older women and girls will find their way to the sport club. Jenkin *et al*. (2021) also found that sport organisations may become more open to cater for participation across the lifespan (Jenkin *et al*. 2021). This view was expressed further in their Physical Activity and Sport Participation (lifespan) framework (Westerbeek and Eime 2021).

We acknowledge some limitations to this study. Firstly, the sports request that their name is not identified to the specific sport results. Secondly, it is limited to five-sports and only includes organised, competitive sport and not other forms of physical activity.

Conclusion

In conclusion, this study examined, separately for men and boys and women and girls aged 5–29 years, participation in five popular community sports in Australia over a 3-year period, including the retention of players within each sport and the transitions of players between the sports. This study was specifically focused on the fact that women and girls have only recently gained broad access to participation in traditionally male-dominated sports. Initially, many of the women and girls were 'new' to sport and not transitioning from another of the five sports. However, in the later years many women and girls transitioned from female-only sport to male-dominated sports. This trend requires consideration of further growth and development strategies by the female-only sport, but also raises capacity and gender issues for the male-dominated sports, as female demand continues to increase, while conversely the participation rate for men and boys declines. Furthermore, sports

organisations still needs to consider retention strategies across genders and ages, as it is still the case that men and boys are more likely to be retained than women and girls, and that a large drop off in participation occurs from peak in participation at ages 5–14 years.

As sport policy and practice continue to evolve, it is recommended that longitudinal studies are conducted so that the sector can understand how the changing practices and policies influence participation trends, and to inform future strategic directions.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

The data is not able to be shared due to confidentiality agreements with the primary data holders, the State Sporting Associations.

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