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The Sport Participation Pathway Model (SPPM): a conceptual model for participation and retention in community sport

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ABSTRACT

National sport policy has a dual focus on population-based participation, and elite performance. There are various models depicting the pathway to elite, however, there has not been a population-based sport participation pathway model to track, develop and facilitate holistic participation policies in sport. The aim of this study is to review sport participation trends, including new data on retention and drop-out across age groups in community club-based sport, and combine this data with evidence from literature about people moving in and out of sport, to develop the Sport Participation Pathway Model (SPPM), which provides a holistic view of sport participation. We conducted a 3-year analysis of sport participation for eight major sports from 2015–2017 for children and young people aged 4–29 years. The total number of participants was 579,696. Only half 50.8% played continuously for the three years, 44.7% dropped out, and 4.5% played discontinuously. Drop-out was highest for those aged 4 (57.0%), and lowest for those aged 10–14 years (39.3%). The SPPM demonstrates the movements of participation in sport and the drop-out at various stages out of competitive club-based sport and for those who are the main participants. The model is a standalone sport participation model that is a representation and integration of empirical sport participation. This model therefore is most useful for sports organisations to recognise issues around retention and drop-out. In developing sport policies, government can also use the model to make decisions on target groups and funding support.

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KEYWORDS
Sport participation; retention; policy; drop-out; community

Background

Sport policy

Globally, national sport policies provide a lead for the associated sports organisations to develop their own strategic plans, policies and practices which in turn provide direction for local community sports clubs. These policies and strategies have a dual focus of community-level population-based participation and at the other end of the participation spectrum, elite performance (Department of Health 2018). At the community level, sport policies are about encouraging people to be active through sport and engage in physical activity (PA) throughout their lives to build and nurture healthy individuals and communities (Department of Health 2018). Australian sport policy development is also about increasing the number of people active through sport and PA for health reasons, and specifically participation should lead to outcomes of improved physical and mental health; personal

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development; strengthening communities and; growing the economy (Department of Health 2018). These are nearly identical to the policy outcomes of Sport England which are to achieve physical wellbeing; mental wellbeing; individual development; social and community development; and economic development (Sport England 2016).

Australian sport policy makers acknowledge that participation in sport and the role that sport plays in the Australian society has changed, and will continue to evolve (Department of Health 2018). There is increasing evidence of a shift from traditional organised and competitive club-based sport to less structured, non-competitive and individual forms of sport and PA (Eime *et al*. 2013, 2015a, Borgers *et al*. 2016, Harris *et al*. 2017, Deelen *et al*. 2018). As such, Australian sport policy has recently been more broadly scoped, and is more in line with conceptualisations used in Europe and specifically by Sport England. This change, from sport being traditionally competitive and club-based, now encompasses 'a broad range of physical activities including informal, unstructured activity such as walking, riding, swimming and running as well as the traditional, structured sport and new and evolving sport and PA offerings such as mixed martial arts, "ninja" style obstacle courses and stand-up-paddle boarding' (p.6) (Department of Health 2018).

Sport participation models

There are various sport participation models all of which have a dominant focus on athlete development towards elite performance. As such, sport policy development has mostly been driven through pyramid models, that depict the movement of mass participation at the foundation base through to elite sporting success at the pinnacle for the very talented few (Green 2005, Bailey and Collins 2013). Green's Model of Sport Development does examine factors related to sport participation and considers stages of recruitment, retention and transition (Green 2005). Further, the Canadian Sport for Life, long-term athlete development framework acknowledges the various ways that people can be active throughout their life (Way *et al*. 2016). However, all of the above-mentioned models do focus on athlete development and transitions into higher levels of competition towards the elite level (Green 2005, Bailey and Collins 2013, Way *et al*. 2016) (Figure 1). The pyramid models depict a performance or talent pathway, and as such focus predominantly on progressing those identified as talented ignoring the majority of (potential) sport participants (Bailey and Collins 2013). Another model, the Developmental Model of Sport Participation (DMSP) discusses the development of sport ability through childhood and adolescence and focuses heavily on participation and early diversification before specialisation (Coté

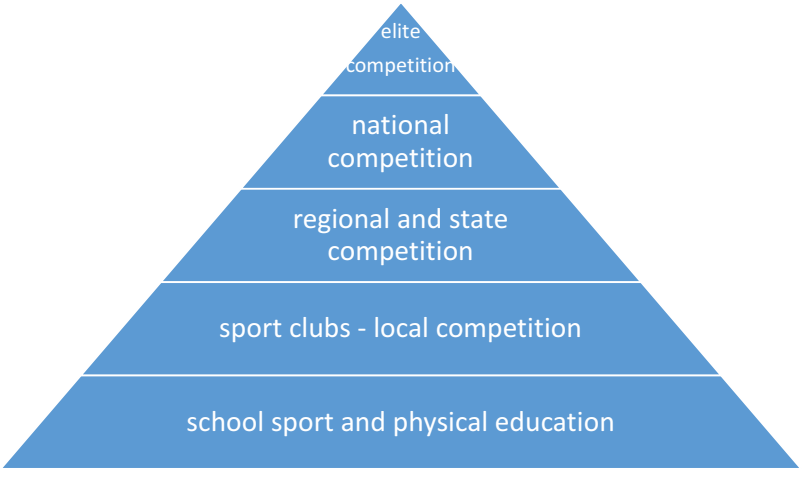

Figure 1. The standard model of talent development (adapted from Tinning et al. (1993).

and Vierimaa 2014). This model does consider that throughout childhood and adolescence the less talented and/or ambitious can continue to play at a recreational level, however its focus is on athlete development and the requirements to achieve international success (Coté and Vierimaa 2014). Yet another sport participation pathway model is the FTEM framework (Sport Sport Australia n.d.). The FTEM represents the Foundations, Talent, Elite and Mastery, with three of its four stages focusing on talent and elite development and mastery. This framework also identifies the foundations of learning and the acquisition of basic movement before talent, elite and master phases. The FTEM like the Canadian Sport for life model does acknowledge that when people move out of competitive and elite sport they can continue to engage in an active lifestyle (Sport Way *et al*. 2016, Sport Australia n.d.).

To date, and to the best of our knowledge, there is no sport participation model that represents participation with the focus being community level club-based sport. Further, previous models depict transitions across various forms of participation in sport and physical activity, however their presentation is not data driven and they do not depict the actual participation levels in each segment of the models. They also do not demonstrate the issue of drop-out. Without acknowledging the actual participation patterns and the issue of drop-out or retention, sport policy remains mainly focused on increasing total numbers and on producing elite players.

In order to remain relevant and sustainable, sport organisations like any other organisation operating in competitive environments, need to maximise their participation base, and one way to secure this is to develop retention strategies. We will return to this issue later in this paper, both from a customer recruitment and retention point of view.

Sport participation trends

The health benefits of participation are only apparent with continued participation (Visek *et al*. 2015). However, there is a body of research highlighting that there are critical transitional life stages related to drop-out or retention in sport and PA which need to be considered

(Women's Health Australia 2008, Craike *et al*. 2009, Eime *et al*. 2013, Talpey *et al*. 2017). Participation patterns at these transition stages often differ between sport and other leisure-time PA (Eime *et al*. 2013, Lounassalo *et al*. 2019). For example there is consistent research that older adolescents shift their participation away from organised, competitive sport and towards non-competitive modes and settings and individual types of PA (Eime *et al*. 2013).

At a national level, policy developed to facilitate community-level sport participation has been driven by an overriding objective of increasing participation numbers. As a consequence, national and state sporting organisations in turn have been pressured (through allocation of targeted funding) into prioritising increasing participation. Examples include tennis, netball and cricket. Tennis Australia's objectives are to have more active players, more great champions, more devoted fans and healthier communities (Tennis Tennis Australia n.d.). The vision for Netball Australia is to be Australia's leading team sport. This is underpinned by an objective to be ranked the number one participation sport in Australia, as well as growing the broadcast audience, increase the success of the elite competition as the world's number one women's sport league, and to be the world's number 1 ranked netball team (Netball Australia 2018). Lastly, the vision of Cricket Australia is to be Australia's favourite sport, a sport for all Australians. The three pillars for achieving this are fans – number 1 for fans; participants and volunteers – number 1 for participation and; elite players and teams – number 1 in all formats (Cricket Australia n.d.).

It can be derived from these examples that community-level sport policy, in theory, is mainly measured by annual sport participation numbers. With such a focus on achieving increased numbers, sports have commonly concentrated their strategies on input measures such as the number of new members signed up for the season, and this has resulted in a strong emphasis placed on expanding the market by including younger participants in an effort to add to total participation numbers and with a lack of attention towards retaining participants (Eime *et al*. 2020b, Westerbeek and Eime 2021).

So far, we have argued that although sport policy as expressed by various sport governing bodies focuses on community-level participation in sport and PA, elite development and performance, to date, theoretical participation models have focused on talent development pathways to elite sports performance. This may partly explain why community-level sport policy drives a focus on increasing participation numbers. Further, we know that participation in sport is not consistent across the lifespan with many different transitions. Sport participation models have not yet presented a population-level participation view, nor has there been consideration of participation transitions including retention and drop-out. The aim of this study is to review sport participation trends, including new data on retention and drop-out in community club-based sport, across age groups, and combine this data with evidence from the literature to develop the Sport Participation Pathway model (SPPM) which provides a holistic view of sport participation.

Methods

It is important to state that our Sport Participation Pathway Model (SPPM) is a conceptual model that was developed based on insights derived from the published scientific literature. We further added to this evidence base by using primary participation data to highlight key age groups in regard to sport participation, but also include evidence of retention and drop-out trends. There is a body of research that discusses sport participation trends, and specifically for children and youth, who are the main participants in community sport. We reviewed the literature, and were concerned with high rates of drop-out particularly during adolescence. Further, we were concerned with what we would consider a myopic focus of government directed sport policy on increasing participation numbers, and failing to consider retention. We utilised a large longitudinal data set of over 570,000 sports participants to further expand the evidence base for findings from the literature. In doing so, this study has applied a mixed-method approach to the development of SPPM. For our conceptual model to stand up to academic scrutiny, we have consulted the current literature to provide the wider (philosophical) context of sport participation (trends) beyond the boundaries of organised club sport. Our primary data is limited to organised club-based sport participation and adds to and confirms many findings related to club-based sport participation from the literature. With the majority of organised sport participation occurring in the 4–29 years age bracket, and as such the evidence base that we can tap into from a research point of view, we have limited our model to that grouping.

For example, recent Australian data presented in this paper confirms other research at which ages participation in sport is most popular and provides further evidence about drop-out of club-based sport, and at what specific ages this occurs. The method of analysis of primary participation data is provided next. Further, specific methods related to the development of the conceptual participation model are provided in the results which further highlights the sport participation retention and drop-out trends, and with links to the key literature.

In the results, we first present the primary data trends on participation and retention, and then discuss the literature and data that provide the philosophical underpinnings to the development of the SPPM.

Participants

In order to understand recent sport participation trends including retention and drop-out we conducted a longitudinal analysis of sport participation records for eight major sports from 2015–2017, whereby individual participation within sports was tracked from 2015 to subsequent years 2016 and 2017. The data for this analysis were collected and analysed as a part of the longitudinal Sport and Recreation Spatial which is now named Physical Activity and Sport Insights (PASI) (pasiglobal.com) programme of research and have been published in detail

previously (Eime *et al*. 2016a, 2016b). This research monitors participation in sport for the purpose of informing policy development and programme planning for the sport and recreation sector.

A participant, or player, was defined as a registered member of a Victorian sporting club competition or programme that was affiliated with one of the State Sporting Associations. Most local community club-based competition takes place under the auspices of these associations, and as such registered participants represent the great majority of participants in these sports, particularly among children and adolescents (Eime *et al*. 2019b).

Data analysis

The primary data analysis for this investigation involved following an individual's participation in a sport from 2015 to 2017. To do this, sport participation records from eight sports (Australian football, basketball, cricket, football (Soccer), golf, gymnastics, netball, and swimming) were amalgamated. These represent popular Australian sports and are within the top 10 Australian club-based sports (Australian Sports Commission 2016a). A participant must have been playing the sport in the first year (2015), and live in Victoria to be part of the analysis. Those aged 4–29 in 2015 were chosen for analysis, as this age range has been shown to generally have higher participation rates (Eime *et al*. 2016b, 2019b). Participation profiles for players in five-year age cohorts (4–29) were produced. The separate four-year-old group was specifically included due to a considerable number of community-level club-based sport participants aged 4, but not younger (Eime *et al*. 2016b). Participants who had missing data for age or sex were excluded from the analysis.

The characteristics of interest in this study were dichotomous participation or no participation. Participants were tracked over time using their sport's unique identifier (i.e. sport 'ID') and were further categorised into a pattern of participation with three categories. 1) Drop-out, where a participant played only in 2015, or played in 2015 and 2016 (but not 2017). 2) Continuous participation from 2015 to 2017. 3) Discontinuous, where the participant played in 2015 and 2017, but not 2016. Participation profiles for players in five-year age cohorts (4–29) were produced.

The 2017 integrated sport participant data for all ages 4–100 was used to develop Figure 4.

Ethics approval was granted by the University Human Research Ethics Committee, project number C13-007.

Results

Sport participation retention and drop-out

The total number of participants used in the analysis was 579,696 (Table 1). At baseline, the majority of the study participants were aged 10–14 years (33.4%) followed by participants aged 5–9 years (31.7%). Males represented 66.1% of the study participants.

Overall, half of the participants 50.8% played continuously for the three years, 44.7% dropped-out and the remainder participated in a discontinuous manner (Table 2).

Drop-out was highest amongst those playing at the youngest age (four-year-olds) in 2015, where 57.0% (n = 8,425) of those aged four and playing in 2015 were not participating in the sport in 2017 (Figure 2). In this age group, just over a third (36.4% n = 5,389) played the sport continuously for the three years. The age cohort with the lowest drop-out of players was the 10–14-year group in 2015 where 39.3% (n = 76,022) players did not continue playing for the three years.

Table 1. Demographics of participants.

	n	%
	579,696	**100.0**
Age range		
4	14,794	2.6
5–9	183,475	31.7
10–14	193,702	33.4
15–19	93,422	16.1
20–29	94,303	16.3
Gender		
Female	196,656	33.9
Male	383,040	66.1

Table 2. Retention pattern by age.

Participation	Age range											
pattern	4		5–9		10–14		15–19		20–29		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Continuous	5,389	36.4	91,918	50.1	112,060	57.9	41,689	44.6	43,463	46.1	294,519	50.8
Discontinuous	980	6.6	8,566	4.7	5,620	2.9	4,930	5.3	5,726	6.1	25,822	4.5
Drop out	8,425	57.0	82,991	45.2	76,022	39.3	46,803	50.1	45,114	47.8	259,355	44.7
Total	14,794	100.0	183,475	100.0	193,702	100.0	93,422	100.0	94,303	100.0	579,696	100.0

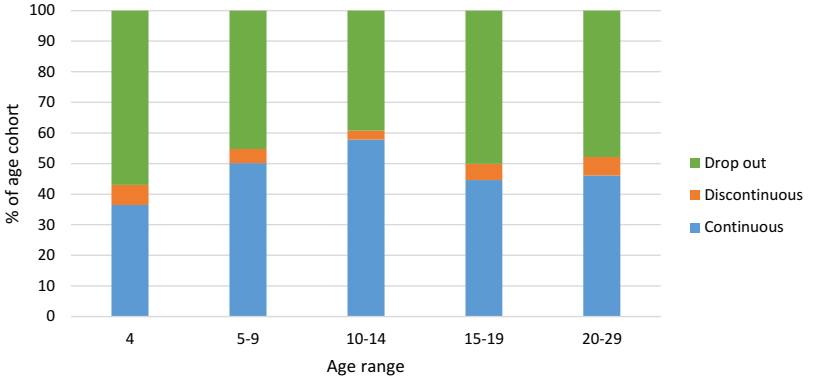

Figure 2. Retention pattern of registered sport participants.

The sport participation pathway model

In this section we provide further context for the development of the Sport Participation Pathway Model (SPPM). Most sports collect annual participant registration data, and when government funding is linked to developing sport policies that focus on increasing total numbers, sport organisations will follow suit. We have demonstrated earlier in this paper, that most sport participation models focus on the elite pathway, but very few sport participants will be elite athletes, and most people will drop-out of active sport participation at some point in time.

The SPPM is a fluid model depicting the flows of sport participation across age cohorts and it shows significant drop-out points in time (Figure 3). Furthermore, when progressing through the model, the issue of (poor) retention in club-based sport is visualised, and its absence from most sport policy exposed (Eime *et al.* 2020b, Westerbeek and Eime 2021). The longitudinal sport participation data presented in the results of this paper demonstrate the significant drop-out rates in community club-based sport, with 45% of participants dropping out within the three years (Table 2).

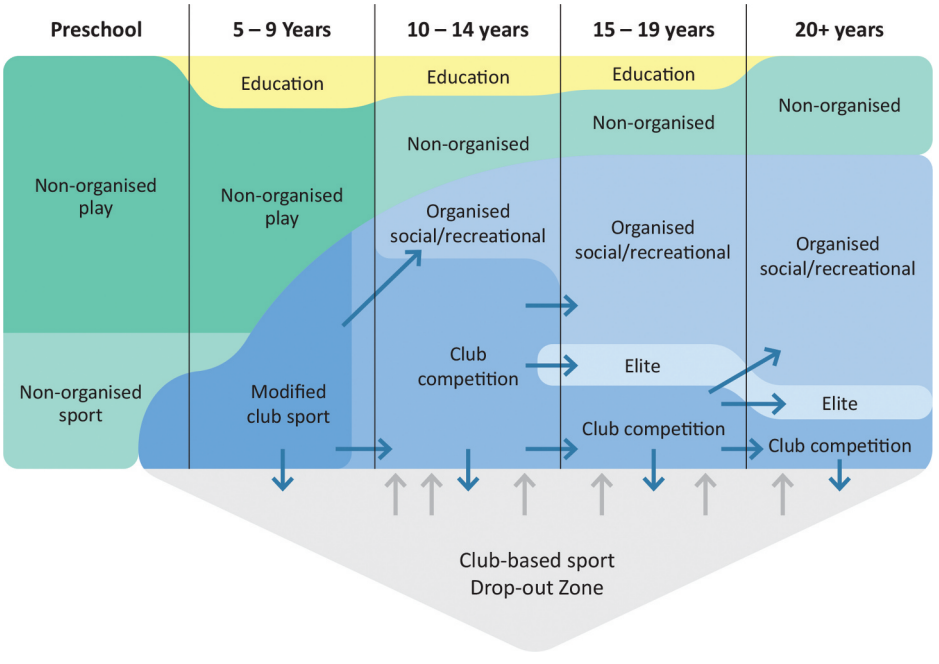

Figure 3. The Sport Participation Pathway Model (SPPM).

The model is not designed to depict all transitions across all physical activities across the lifespan. It is also not intended to include similarities, differences or nuances presented by considering various demographic variables such as gender or socio-economic status. Whilst it is acknowledged that such variances will exist, the model is intended to serve as a macro- or generic view of participation, a population-based holistic 'sport' participation model with a focal point on community level club-based sport and on the issue of retention or drop-out. The generic model may serve as a starting point for future research that investigates sport participation trends across demographic and psychographic variables. Sport can be broadly defined as competitive games played by agreed to rules, often with purpose designed equipment and in delineated (physical or natural) facilities. Within this broad definition in mind, and within the different forms that people play sport, we have identified various versions of sport ranging from sport played outside the club environment (non-organised), modified club sport, formal competitive sport in club competitions, to elite competitive sport at the highest level of performance (Deelen *et al*. 2018, Department of Health 2018, Keegan *et al*. 2019, Eime *et al*. 2020a, Westerbeek and Eime 2021). 'Education' in the model refers to sport being played whilst in primary, secondary or tertiary education environments. Participation in sport and PA through education systems like Physical Education in countries such as Australia is very low, and therefore depicted in the model as not contributing largely to the total activity levels of children and adolescents (Allender *et al*., 2020).

Organised social/recreational sport can occur in sporting clubs, but increasingly is offered by various private or public organisations that are not sporting clubs. At the heart of the model however, remains the concept of 'sport' as broadly defined above. The drop-out zone specifically represents dropping out of sporting club delivered sport – and as such, dropping out of organised and competitive club-based sport.

As noted earlier, the SPPM is not designed to identify or address the key barriers to participation in sport across lifestages as they have been articulated previously (Basterfield *et al*. 2016, Gardner *et al*. 2017, Somerset and Hoare 2018, Fowlie *et al*. 2020). Rather, it seeks to comprehensively map how people of all ages may engage in sport participation, and what are the critical transition points

in and out of different types of sport activities. The model can be viewed as a flow diagram, in which people move from one life stage to the next. The model is divided in five columns that break up the population across age groups that are broadly defined according to research evidence regarding participation in sport by age. Further, the arrows depict the main movement or transitions from community-level club-based sports, and into other activity types and settings across the age groups. This also includes arrows of movement from club-based sport altogether, and this is termed the drop-out zone. For example, many children aged 5–9 participate in modified sport and then transition into organised competition, and more so than into organised social/recreational programmes, which are currently largely absent for these age groups. Some people participate in sport in an intermittent manner, as evident in the primary data presented and previous literature. A 7-year study reports that 22% of the cohort participated intermittently as they dropped-out and later returned to playing the same sport (Eime *et al*. 2020b). The blue arrows provide an indication of movement of participants across the different sporting pathways and also for those dropping-out of sport. The grey arrows represent a currently under prioritised movement of people out of drop-out and re-engaging back into sport.

The age groups are separated by (also evidence based) critical sport transition points. Within each life stage we have identified the various contexts in which sport participation during that life stage takes place (Eime *et al*. 2015b, 2018, 2020a). The size of the different shaded areas broadly represents the relative focus on that activity during that life stage or age group. For example, most if not all of modified club sport is played by 5–9-year-olds (Eime *et al*. 2015b, Zaccagni *et al*. 2017, Buszard *et al*. 2020) whereas those 20 years and older – if and when active – spend most of their time in organised, social and recreational sport (Hulteen *et al*. 2017, Eime and Harvey 2018, Eime *et al*. 2020a).

The SPPM demonstrates that during the **Preschool** years, children are mostly participating in or be active through non-organised play, followed by non-organised sport and organised modified sport. It has also been suggested that perhaps most preschool-aged children may not be developmentally ready for organised sport (Committee on Sports Medicine and Fitness and Committee on School Health 2001).

There is evidence that many pre-schoolers (aged 4 years) participate in modified club-based sport (Eime *et al*. 2015b, 2018). Nearly, a quarter (24%) of Victorian children aged 4 play one of 11 major sports (Eime *et al*. 2019b). However, many drop-out before they transition to club-based competition (Eime *et al*. 2015b, 2018). From these results, the authors argue that the optimal age of entry into modified sport participation for continued participation and transition into club-based competition is between the age of 6–9 years (Eime *et al*. 2015b, 2018, 2020b). Although the results of the primary data presented in this paper and literature indicate that many preschool children play organised sport, the drop-out is highest for this age group (57%) (Table 2), which is why we visualise in the model that they will mostly be playing non-organised activities but we have included entry of a cohort into organised or competitive club-based sport in the SPPM for those aged 4.

Through the early school years **5–9 years**¸ the second age group of the SPPM, participation in modified club-based sport is very popular with over half of males and females aged 5–9 participating in one of 12 major club-based sports (Eime *et al*. 2019a), which is reflected in the SPPM in dark blue. This is supported by the primary data, with 32% of all sport participants aged within this 5-year age group (Table 1). Participation in sport is the primary means of physical activity for children (Visek *et al*. 2015). Children are also active through non-organised PA or free-play and more likely to participate in free play than in organised sport (Australian Sports Commission 2016b), as highlighted in green (Figure 3). Within schools, children have the opportunity to play sport in either formal sport competitions or physical education (Eime *et al*. 2016c, González-Cutre *et al*. 2018)} (Yellow, Figure 3). From the ages of **10–14 years** approximately half of children play competitive club-based sport and many of them have transitioned from participation in a modified sports programme (Blue, Figure 3)(Eime *et al*. 2015b, 2018,

Howie *et al*. 2016)}. However, many also drop-out of sport, but there is no research highlighting the enormity of this issue. During these years, children can also be active through non-organised activities and in school activities (Eime *et al*. 2016c, Cairney and Veldhuizen 2017). In the SPPM this is represented by the **club-based sport drop-out zone**. The SPPM also demonstrates that club-based sport (dark blue shading) is most popular amongst children aged 5–14 before considerable drop-off. This is supported by the primary data whereby 65.1% of the participants (Table 1) were within this 10-year age group.

During late adolescence, among those aged **15–19 years** there is a significant decline in participation in club-based sport (Figure 4), and there is much evidence supporting this decline, which is more pronounced for females than males (Mathisen *et al*. 2019, Eime *et al*. 2019b) (Figure 2). The primary data highlights that from 10–14-year age group to the 15–19-year age group, participation halves (Table 1). As represented in the SPPM (Figure 3) the elite (high-performance sport) cohort represents a very small proportion of sport participants. This is consistent with other models and literature, demonstrating the small number of elite participants compared to the community-based sport participants (Figure 1).

Children can transition from modified-sport to club competition, and in Australia the vast majority of club-based sport for children is traditional club-competition. 'Organised-social-recreational' sport which is light blue in the SPPM, is largely an underdeveloped offering for that segment of the market, except for an increasing number of social-recreational programmes for adults which would fit into this category, such as Rock-up-Netball, bowling with babies, J-ball social hockey, and cardio-tennis. In 2017, from the ages of **20+ years** few adults, and fewer older adults participate in club-based sport (Figure 4), which is consistent with previous literature (Eime *et al*. 2016a, Lounassalo *et al*. 2019)}. People drop-out of sport at any age, but with sport policy historically focusing on total participation numbers, the actual extent of drop-out across age groups has been unknown and sport organisations have not been incentivised to retain participants.

Discussion

This study is based on a significant body of sport participation research and uniquely extends this knowledge with primary data regarding community level club-based sport participation (n = 579,696), and demonstrates the significant issue of drop-out in sport. Nearly half (45%) of the sports participants aged 4–29 dropped out of participation in their sport over a two-year period. Based on this data and the published literature on sport participation we developed the SPPM to provide a more holistic view of sport participation from a population perspective and

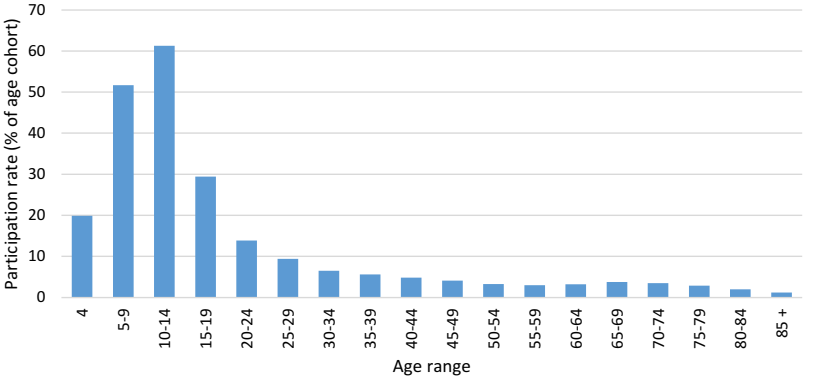

Figure 4. Participation rates, 2017, Victoria: by age.

across ages (4–29) where the far majority of participation occurs. Our starting point is community-club-based sport, and the model clearly depicts the transitions away from club-based sport to other forms of sport and physical activity.

The SPPM visualises the patterns of participation in organised, elite, non-organised sport and social and recreational sport-related activities across age groupings and displays the issue of drop-out in sport, specifically for adolescents. It clearly highlights that participation in club-based and competitive sport is popular for children, however very few adults participate in this form of sport. Our model extends beyond the scope of other participation models that tend to focus on the talent development pathway. However, given that few make it into elite sport and that the majority of the population is not participating in organised sport, there is a need for a holistic sport participation model that better captures this majority cohort and offers scope for sport policy development towards more active lifestyles.

Sport is still largely stuck in a traditional (Northern European inspired) club-based competitive structure (Ibsen *et al*. 2016). The data and model provided in this paper, in addition to previous research, underpin the case that sport organisations in the traditional club-based structure will find it hard to cater for the broader population (Eime *et al*. 2015a, 2016b, Harris *et al*. 2017, Westerbeek and Eime 2021). We have argued that historical and current sport policies focus on increasing numbers, and do little to assist increasing participation at the population level. It is important in that regard for governing bodies to recognise that organised and competitive sport, in its current dominant format of offering, and still with a bias towards athlete development models does not appeal to potential participants past early adolescence. Drop-out and retention are also real issues for the management of sport, as sport organisations need participants as customers to maintain their operations and to compete against other popular sports, and to support the competitions and player development pathways and elite programmes (Clavel San Emeterio *et al*. 2016, Talpey *et al*. 2017).

An immediate change of policy direction may be from solely 'recruiting new participants' to also focus more on 'retention of those who are playing sport already', and this may deliver several distinct outcomes. Firstly, it is a commonly known fact in consumer marketing that it is much cheaper to retain existing customers than it is to recruit new ones (Clavel San Emeterio *et al*. 2016). Secondly, a strategic focus on also retaining participants will support the overall operations of the sport. Thirdly, a strategic focus on retention of customers forces senior management of the organisation to better listen to the needs, wants and desires of its current customers. To better deliver on their demands leads to higher lifelong customer value and loyalty, in turn leading to a higher likelihood of remaining involved with the sport(ing club) in various capacities other than being an active player. A Spanish study of customers of a fitness centre took a business approach to understanding customer loyalty and predicting retention and drop-out (Clavel San Emeterio *et al*. 2016). The research found that it is important to act when customers show the first signs that they are considering leaving. Whilst this study was limited to a single leisure centre, it was concluded that the higher the age and longer the length of membership the lower the probability of drop-out (Clavel San Emeterio *et al*. 2016). Sporting clubs can apply these learnings from the fitness industry as these insights are consistent with an Australian study of cricketers who also reported higher retention amongst those who have played for more years (Talpey *et al*. 2017).

Further, the Spanish study reported that the likelihood of drop-out decreased with the amount of money invested by members. They concluded that loyalty building strategies that reward advance payments and cross-selling can be effective in minimising drop-out (Clavel San Emeterio *et al*. 2016). This approach could be implemented in community-based sport, and especially if it assists with understanding drop-out before it occurs. An added benefit is the fact that there is significant economic value in retaining customers/sports participants.

As noted in the previous paragraph, governing bodies and sport clubs have to become smarter and more strategic in their marketing and service offering focus (Australian Sports Commission 2013a, 2013b, Eime *et al*. 2016b, Westerbeek and Eime 2021). With the evidence presented in this

paper about transition points during the early life-stages and the type of sport offerings (potential) participants want, the extent and duration of their membership-based involvement can be intensified and prolonged. However, it needs to be recognised that sport is not for everyone, and only for a few there is continuous participation throughout their lifespan (Westerbeek and Eime, 2021).

Participant drop-out in sport is a problem for sport management however is not necessary a problem in terms of public health, as long as people remain active through other pursuits.

We need to acknowledge that a limitation of the sport participation dataset used in this study is that it does not cover all sports, nor does it include other non-organised sport participation, or any general PA. In addition, it focuses on participation data from a very large, Australian dataset. Further, the model does not depict all transitions across all physical activities across the lifespan.

Recommendations for further research include understanding individuals' transitions into and out of sports and other PA across the lifespan, delivering sport and PA profiles that collectively can measure and monitor individuals' health enhancing behaviours. This would also include an investigation of why people play sport and why they drop-out across various different demographic groups.

Conclusion

The SPPM, and the sport retention-related data, presented in this paper, visualises trends in participation in sport and the high drop-out of competitive and club-based sport. The model is developed specifically around sport participation and as such provides a tool for policy development and implementation in sport. However, we need to stress that the model is agnostic in that it represents people moving in and out of organised sport within the different ages/life stages. The model is a standalone sport participation model that is a representation and integration of empirical data on sport participation. This model therefore is most useful for sports organisations to recognise issues around retention and drop-out. We have extensively drawn on the separate bodies of literature that explain various sport participation trends related to age, gender, location, and type of sport played. Our model integrates these participation trends across different life-stages, so that sport managers can plan their recruitment and retention programmes more strategically. In developing their sport policies, government at the national and regional level can also use the model to make decisions on target groups and where to provide funding support.

In that regard, drop-out and retention are real issues for sports management, as sport organisations need participants to maintain their operations and to compete against other popular sports, and to support their competitions and elite player developments. The SPPM is the first model (to our knowledge) that offers sport policy makers and sport organisations an insight why and when to strengthen their strategic focus on retention of participants. Furthermore, sport policies are rarely critically evaluated by sports organisations, and as such this model will provide a tool for that. Critical evaluation of sport policy in that regard should take the lens of our model's (unique) life-stage approach – to work towards participation and retention strategies across different age cohorts. We therefore also recommend that the collection, analysis and reporting of longitudinal sport and PA data is expanded, to better serve policy evaluation and redirection.

List of abbreviations

DMSP: Developmental Model of Sport Participation
FTEM: Foundations, Talent, Elite and Mastery
PA: Physical Activity
SPPM: Sport Participation Pathway Model
SMTD: Standard Model of Talent Development

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Availability of data and materials

The data is not able to be shared due to confidentiality agreements with the primary data holder. Data is not available at all, even to researchers.

Ethics approval and consent to participate

Ethics approval was granted by the Human Research Ethics Committee of the Federation University, Australia, (C13-007) for secondary data analysis of de-identified sport participation data which had been collected by the primary data custodians.

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