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Relations Between Previous Sport Participation and Performance by Developmental Level in University Track and Field Sprinters

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Trevor Moore (MA), earned his Bachelor of Science in Kinesiology and his Master of Arts (MA) in Health and Physical Education from Brock University. He was a sprinting coach for a regional Track and Field club in southwestern Ontario for several years and is currently a sprint coach in the United States.

Abstract

In response to research calls, the aim of this study was to discover levels of previous sport participation as a function of developmental level in university track and field sprinters and how that was associated with their sprinting performance. Data was collected using an online survey of 42 university varsity 60m sprinters (aged 18 – 23 years) from Canada and the United States. Each athlete's performance results (times) were accessed from the U-Sport ranking database. Results revealed that sprinting had the highest previous sports participation (especially after age 13), overall previous sports participation dropped significantly by developmental level, sprinters were somewhat less prone to participating in other sports (especially before age 18), and previous sports participation did not statistically relate to or predict sprint performance overall or by developmental level. The findings affirm previous research suggesting that track and field sprinting is generally a late specialization sport.

Keywords: age level; physical literacy; speed; specialization; sprinting

Résumé

En réponse aux appels de la communauté scientifique, cette étude visait à examiner les niveaux de participation sportive antérieure de sprinteurs universitaires en fonction du stade de développement, ainsi que leur association avec la performance en sprint. Les données ont été recueillies au moyen d'un questionnaire en ligne auprès de 42 sprinteurs universitaires de 60 m (âgés de 18 à 23 ans) provenant du Canada et des États-Unis. Les résultats de performance de chaque athlète (temps réalisés) ont été extraits de la base de données de classement U-Sport. Les résultats ont révélé que le sprint avait la plus forte participation sportive antérieure (surtout après l'âge de 13 ans), que la participation sportive antérieure globale diminuait de manière significative selon le stade de développement, que les sprinteurs étaient un peu moins enclins à participer à d'autres sports (surtout avant l'âge de 18 ans), et que la participation sportive antérieure n'était pas statistiquement associée à la performance en sprint, ni prédictive de celle-ci, tant globalement que selon le stade de développement. Ces résultats confirment des recherches antérieures suggérant que le sprint est généralement un sport à spécialisation tardive.

***Mots-clés*:** niveau d'âge; littératie physique; vitesse; spécialisation; sprint

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Introduction

Existing theory in sport for physical literacy (Dudley & Cairney, 2021), optimal development (Côté et al., 2009; Gullich et al., 2025; Waldron et al., 2020), and specialization (Kearney et al., 2021) encourages engagement in a variety of sports through childhood and adolescence, to enable participants to play and build the confidence, motivation, and requisite movement skills for lifelong physical activity and for opportunities to invest more rigorously in one or more specific sports. In addition to a host of benefits associated with participation in sports and physical activities in children and youth (Baker et al., 2018), engaging in ample free and more purposeful play in a variety of sports and activities at younger ages enhances the development and career length of elite athletes (Côté et al., 2009; Gullich et al., 2025; Huxley et al., 2017). One sport that individuals could eventually choose to specialize in is track and field; more specifically, the sprinting events wherein participants run with maximal speed, propulsion, power, and explosiveness across short distances of 400m or less (Bushnell & Hunter, 2007). Very little research has investigated the potential role of previous sport participation (PSP) across different developmental levels (ages 8 to 13; 14 to 17; and 18 and over) and how it relates to performance results in track and field sprinters. The aim of this study, therefore, was to discover levels of previous sport participation (PSP) and whether this was associated with university-level track and field sprinting performance as a function of developmental level.

The Developmental Model for Sport Participation

The Developmental Model for Sport Participation (DMSP; Côté et al., 2009; Côté & Vierimaa, 2014) posits that athlete development is enhanced when the focus of child and adolescent sport focuses on essentials such as participation, appropriate play and practice, and holistic personal development. Beginning with organized sport at approximately age 6, the model houses three potential sports participation pathways. The first two pathways promote broad sampling of sports and physical activities from ages 6-12 for either recreational or more elite performance goals that consist of high amounts of deliberate play and low amounts of deliberate practice. According to the DSMP model (Côté et al., 2009; Côté & Vierimaa, 2014), deliberate play involves participating in physical activities because they are inherently enjoyable – yet might still develop expertise – and are usually self-directed by children, recreational in nature, and can be adapted according to need (e.g., as in playing one versus one rather than regulation basketball). On the other hand, deliberate practice involves participating in more structured leader-initiated physical activities that are overseen by an organization (e.g., sports club or school) and for the overall aim of improving sports performance.

Research (e.g., Côté et al., 2009; Côté & Vierimaa, 2014; Gullich et al., 2025) has shown that many recreational and elite athletes engage in high amounts of deliberate and multidisciplinary (diverse sports and physical activities) play during childhood and youth which provides them with the opportunity to explore diverse movement options while developing a diversified movement foundation and attributes such as confidence, social-emotional skills, leadership, and intrinsic motivation. For example, deliberate play-like activities were crucial in the beginning years of sport engagement for elite athletes in sports like tennis, rowing, baseball, and hockey (Soberlak & Cote, 2003). Generally, however, more deliberate practice than play is necessary after age 12 for developing the requisite attributes to specialize and invest in 1-3 more competitive sports during ages 14-17 and/or into adulthood (Cote & Vierimaa, 2014). Finally, at approximately age 16, individuals tend to have the requisite maturation and abilities to continue in recreational sport and physical activities or to choose to "s*pecialize*" in their sport of choice at a more demanding level of commitment, time, and intensity (mainly deliberate practice) year-round to master and excel in that sport while neglecting other sports (Waldron et al., 2020). Some participants choose to delay specializing in one sport, especially "*late-specialization*" sports (e.g., cycling, tennis, triathlon, rowing, combative, racquet and team sports) wherein optimal performance is generally attained after physiological (e.g., height, weight, strength, and power) maturation in early adulthood; and, doing so has been linked to lower rates of attrition and less frequent sporting injuries (Cote & Vierimaa, 2014).

The third and final pathway in the Developmental Model of Sport Participation involves "*early specialization*" in a single technically demanding sport (e.g., gymnastics, diving, figure skating) because it tends to be a disadvantage to optimal performance in some sports to be more physically mature as in post-pubescents (Swindell et al., 2019). Young sports participants are often under pressure to specialize early in a sport (some as early as age 7) wherein they forfeit sports sampling or deliberate play to invest considerable effort engaging in deliberate (not necessarily enjoyable) practice for the explicit aim of achieving elite skills and performance (Waldron et al., 2020). Research (e.g., Baker et al., 2018; Swindell et al., 2019) has revealed that athletes often specialize early in a sport – which is more likely in individual sports than in team sports – to discover their talent and to enhance their competitive edge, skill acquisition, focus, knowledge, confidence, and future opportunities in that sport. Alongside these potential perks, however, are increased risks for overuse injuries, improper rest, social isolation, burnout, disinterest in sport, lack of physical activity, and low self-esteem in both the short and long term. For example, Waldron et al. (2020) explains that potential athletes who specialize in a sport – especially those doing so at younger ages when they are at more maturational risk – tend to miss out on the accrued benefits associated with playing multiple sports especially in diverse transferable skills and tactics across sports. To avoid this, it is generally recommended that athletes should sample multiple sports in childhood and early adolescence, and that the small proportion who do specialize early should be well supervised and have sound justification for doing so to minimize the associated harmful risks (Côté & Vierimaa, 2014; Gullich et al., 2025; Waldron et al., 2020).

Participation in Track and Field Sprinting

The average age of specialization in track and field is 15.4 years of age (Swindell et al., 2019) and one study (Malina, 2010) reported that 46% of NCAA Division 1 female track and field athletes' first ever experience with track and field was at age 10. Huxley et al. (2017) reports that peak performance in track and field is typically between the ages of 24 and 28 years as it requires attributes such as maximum strength and power that emerge well after physiological maturation; so event specialization in track and field does not need to begin before the ages of 18 to 21. Specific to sprinting, an Australian study by Hollings et al. (2014) found that the mean age for peak performance in the 100-meter sprint was 24.5 years of age with a duration of approximately 4.3 years, whereas it was 25.4 years over a period of 4.2 years in females. They highlighted the importance of preliminary participation in other sports during childhood and/or youth and in specializing in track and field three to four years prior to participant's expected peak age. Finally, Kearney et al. (2021) noted that the majority of elite under-20 aged track and field athletes were unlisted (unranked) during the younger ages. Proportions of those who retained their top 20 ranking for the 100m sprint were only 3.1% of males and 21.2% females in both the under-13 and under-20 age levels compared to 32.6% of males and 50% of females in both the under-17 and under-20 age levels. This signals that elite under-20 sprinters were more likely to maintain their "elite" status if they excelled in the under-17 level than in the under-13 age level. Kearney et al. (2021) added that, for such reasons, track and field is classified as a rather "late specialization" sport with corresponding recommendations for children and pubescent youth to participate in track and field along with other sports and physical activities so they can first learn fundamental movement skills such as running, jumping, and throwing.

Study Objectives

Despite these advances in knowledge about the developmental trajectories of elite track and field athletes, researchers (e.g., Dudley & Cairney, 2021; Kearney et al., 2021; Waldron et al., 2020) have called for more research into the previous sports participation of athletes in more specialized sports, events, and roles/positions by development level. For this reason, this study investigated previous sport participation (PSP) across different developmental levels (ages 8 to 13; 14 to 17; and 18 and over), and, how that relates to performance results in university track and field sprinters. The three specific objectives for the study were to investigate: (1) collective (aggregate) levels of previous organized sport participation (involvement levels, years of involvement, and frequency of participation by sport) in university track and field sprinters; and how these aggregate levels of previous sports participation (2) varied by developmental level (ages 8 to 13; 14 to 17; and 18 and over) and, (3) related to participants' performance in the 60m sprint by developmental level. These developmental levels reflect the age categories for the various pathways and postulates of the DMSP (Côté et al., 2009; Côté & Vierimaa, 2014).

Methods

Participants

Following approval from a university Research Ethics Board, and initial consent from willing coaches and current Canadian university student-athletes competing in sprinting events through their university's varsity track and field team, a total of 37 sprinters volunteered to participate in the study. To increase the sample size, competing sprinters from two universities in the United States were also invited and consented to participate. This added five participants culminating in a sample of 42 participants (17 or 40.4% women; 25 or 59.6% men) aged 18 to 23 (M =19.90, SD=1.41). This sample's academic year in university ranged from first to fifth year (M = 2.19, SD = 1.21) and their year of eligibility ranged from one to five years (M = 1.95, SD = 1.03). Of the 42 participants, 38 completed the online survey and 34 were sprinters at the appropriate 60m distance for this study.

Measures

To measure sprinting performance, each participant's fastest university competition sprint time was collected from the U-Sport ranking database (trackie.ca) that included participants from both Canada and the United States. To ensure that sprinting performance reflected by a shorter distance using similar physiological demand (e.g., alactic, creatine phosphate system) as asserted by Majumdar and Robergs (2011; also see Philips, 1997), sprinting performance in this study was limited to those competing in and having performance times in the 60m (n = 32) or the 60m hurdles (n = 2). Hence, the eight participants in the study who competed in sprinting events of a longer distance (100m-400m) were excluded from the analyses using sprint performance results. Sprint performance times in seconds were first converted into z-scores and then percentiles so that a higher percentile coincided with a lower time (faster speed).

Participants completed an online survey using Qualtrics through their cell phone or computer that consisted of 16 items and took 5-10 minutes to complete. The first several items asked participants to report demographic information (e.g., age, sex, and their year of university studies). Four items assessed a scale not used in this study. For the remaining items, respondents completed three final items separately for each of the three developmental levels (ages 0-13/grade eight or under; ages 13-18/high school; and ages 18-23/college or university). Prior to completing these final items, respondents were provided with a list of 43 sample individual and team organized sports common in Canada and the United States that they could refer to and apply to the final items. If a particular sport was not on the list of sample sports, participants could add it in their responses. In contrast to a "self-organized" sports and physical activities (e.g., playing badminton in a backyard or a game of pick-up soccer on the school yard), this study assessed rather organized sports that are formally structured, governed at various levels (i.e., national, provincial or local), monitored by a coach, and include structured practices, scheduled games, and training (Wiium & Säfvenbom, 2019). After listing the sports they had played in a particular developmental age level, respondents stated their level of *involvement* in each of those sports (on a scale of 1 to 5 with 1 = not very involved and 5 = very involved), and finally reported the *number of years* that they participated in each of those sports (0 = less than one year, 1 = one year, 2 = two years, 3 = three years, 4 = four years, 5 = 5 years, and 6 = six years or more). The *frequency* of previous sport involvement was the total (sum) number of respondents that reported participation in each organized sport and was only used for descriptive purposes in this study.

Previous sports participation (PSP) has been used previously in the Developmental Model of Sport Participation research (Côté & Vierimaa, 2014) and others such as Martin et al. (2021) who adopted similar measures of pre-adult interscholastic sport participation by the sport(s), number of sports, and level of involvement. Richman and Shaffer's (2000) study with females reported that – similar to other studies with males – "greater pre-college sport participation predicted more favorable body images, greater perceived physical competencies, more flexible gender attributes, (i.e., masculinity), higher self-esteem, and greater college academic competence" (p. 194). Hence, previous sport participation (PSP) in this study was the sum of each participant's *involvement* level in each sport (scale of 1 to 5) and the *number of years* they participated in each sport (0 to 6 years or more). To illustrate this from the data in Table 1, the values for badminton in Table 1 would reflect that a total of four respondents reported playing organized badminton during ages 8-13, three did at ages 14-17, and none did at ages 18 and after. These values then reflected how *frequently* the various sports were played by this pool of university sprinters. For example, the track and field sprinting row under the frequency column of Table 1 shows that sprinting was the sport with the highest frequency of participation in this sample (n = 84; that is 14 in ages 8-13 + 32 in ages 14-17 + 38 in 18 and over). The PSP column reflects respondent's reported *involvement* (not very to very) added to their *years* of participation (0-6 or more) and is (for badminton) 18 at ages 8-13 and 13 at ages 14-17 for a total PSP (final row) of 31. The bottom row of the frequency column reflects the total (sum) of the number of sports (frequency) the respondents participated in at each developmental level whereas the bottom row of PSP column provides participants' sum PSP during each developmental age span.

Table 1
Previous Sports Participation by Developmental Level

Sport	Frequency			PSP			PSP Total
	8-13	14-17	18+	8-13	14-17	18+	
Archery	1	0	0	2	0	0	2
Badminton	4	3	0	18	13	0	31
Baseball	9	2	1	60	17	6	83
Basketball	13	10	0	99	65	0	164
Beach VB	0	1	0	0	7	0	7
Cheerleading	1	0	0	8	0	0	8
Cricket	1	1	0	8	4	0	12
X-Country	9	6	0	67	35	0	102
Curling	2	0	0	8	0	0	8
Dance	2	0	0	18	0	0	18
Diving	1	1	0	5	5	0	10
Fastball	1	0	0	10	0	0	10
Field Hockey	2	2	0	17	13	0	30
Football	6	5	1	43	29	8	80
Golf	3	3	0	22	16	0	38
Gymnastics	2	2	0	22	18	0	40
Hockey	11	9	3	107	67	15	189
Judo	1	1	0	8	5	0	13
Karate	1	1	0	8	4	0	12
Lacrosse	3	0	0	17	0	0	17
MMA	1	0	0	11	0	0	11
Rock Climb	1	0	0	4	0	0	4
Rugby	3	7	0	20	45	0	65
Skeleton	0	0	1	0	0	7	7
Ski/Boarding	1	1	1	10	8	4	22
Soccer	20	10	1	161	65	8	234
Softball	1	1	0	3	3	0	6
Swimming	4	1	0	30	5	0	35
Table Tennis	1	0	0	7	0	0	7
Tennis	2	0	0	7	0	0	7
Track and Field Jumps	1	2	1	11	13	5	29
Track and Field Sprints	14	32	38	105	262	257	624
Triathlon	2	0	0	17	0	0	17
Tai Kwan Do	1	0	0	7	0	0	7
Volleyball	10	11	1	66	73	5	144
Wrestling	2	0	0	8	0	0	8
Column Sum	137	112	48	1014	772	315	2101
Column %	46	37.8	16.2	48.3	36.7	15.0	100

Notes. Values for Previous Sports Participation (PSP) = the sum of involvement level in each sport (scale of 1-5) and years of participation in each sport (0-6 or more).

Data Analysis

Using the Statistical Package for the Social Sciences (SPSS; Version 25), descriptive statistics were used to confirm distribution normality (e.g., skewness and kurtosis) and frequencies, means, and standard deviations for each variable in the study. Repeated measures analysis of variance was used to uncover if these levels of PSP differed by the developmental levels of age 8 to 13, 14 to 17, and 18 and over. Pearson bivariate correlations and linear regression were used to examine relations between PSP and university sprinting performance times overall and by developmental level.

Results

The results of the first objective of this study (to ascertain the levels of PSP overall, in track and field sprinting, and in sports other than track and field sprinting by developmental level) are illustrated in Table 1. As expected due to the study sample of sprinters, track and field sprinting was the sport with the highest frequency of participation (f = 84) and PSP (n = 624) overall, followed by soccer (f = 31; PSP = 234), hockey (f = 23; PSP =189), basketball (f = 23; PSP = 164), and volleyball (f = 22; PSP =144). When differentiating these by developmental level, the most common sports in ages 8-13 were soccer (f = 20; PSP = 161), track and field sprints (f = 14; PSP = 73), basketball (f = 13; PSP = 99), hockey (f = 11; PSP =107), and volleyball (f = 10; PSP = 66). From ages 14-17, the highest sports participation was in track and field sprints (f = 32; PSP = 262), volleyball (f = 11; PSP =73), basketball (f = 10; PSP =65), soccer (f = 10; PSP =65), and hockey (f = 9; PSP = 67). Participation in non-sprinting sports decreased notably after age 17 (e.g., hockey with f = 9 and PSP =67 at ages 14-17 dropping to f = 3 and PSP =15 during the university years) while track and field sprints increased consistently across the age periods to peak during university (f = 38; PSP =257).

Results pertaining to the second objective (variations in PSP by developmental level) revealed that – except for the sprinting events that increased in frequency and PSP across the developmental levels (f = 14 and PSP =105 at ages 8-13; f = 32 and PSP =262 at ages 14-17; and f = 38 and PSP =257 during university) – there were several indicators that the participation in organized sports decreased across the age periods. First, the frequency of sports participation dropped from a high of 137 (46%) in ages 8-13 to 112 (38%) in ages 14-17 and 48 (16.2%) in university. Second, PSP dropped similarly from a high of 1014 (48.3%) in ages 8-13 to 772 (36.7) in ages 14-17 and 315 (15.0%) in university.

Third, when considering PSP in individual participants, the mean of PSP dropped similarly across developmental levels as it was 27.41 for ages 8-13, 20.86 for ages 14-17, and 8.29 for the 18+ age group. Fourth, the repeated measures ANOVA revealed that PSP decreased significantly across the three developmental age groups, F (1.70, 34) = 49.48, p < .001, η^2 = .586. Since Mauchley's test of sphericity signaled the violation of assumption of sphericity (p = .013), the Huynh-Feldt values adjusting for this were used instead. Post hoc t-tests revealed significant differences between each age group: ages 8-13 and 14-17 [t (35) = 3.11, p = .004]; ages 14-17 and 18+ [t (36) = 8.46, p < .001]; and ages 8-13 and 18+ [t (36) = 8.44, p < .001].

The third objective of this study was to uncover how participants' PSP (M = 55.29, SD = 23.84) related to their sprint performance (M = 55.16, SD = 27.41). Bivariate correlations (Table 2) revealed that PSP did not statistically relate to sprint performance overall (r = .04) or by developmental level: (r = -.16 in ages 8 to 13, r = .22 in ages 14 to 17, and r = .25 in ages 18+). Linear regression analysis further confirmed that PSP did not predict sprint performance overall

[R^2 = .002; F (1,28) = .05, p = .821] or by developmental level: [R^2 = .025; F (1,28) = .731, p = .400] in ages 8 to 13; [R^2 = .049; F (1,28) = 1.43, p = .241] in ages 14 to 17; and [R^2 = .061; F (1,28) = .1.83, p = .187] in ages 18+.

Table 2
Descriptive Statistics and Scale Correlations

Scale	M *(SD)*	1	2	3	4	5
1. Faster Sprint Performance	55.16 *(27.41)*	-				
2. PSP Overall	55.29 *(23.84)*	.04	-			
3. PSP 8-13	26.68 *(14.67)*	-.16	.89**	-		
4. PSP 14-17	20.32 *(10.43)*	.22	.84**	.55**	-	
5. PSP 18+	8.29 *(3.86)*	.25	.50**	.25	.43**	-

Notes. N = 38; * p < .05; ** p < .01; PSP = Previous Sports Participation (Sum of Involvement and Years).

Discussion

The three objectives of this study with university track and field sprinters were to investigate PSP and frequency of participation by sport, how these vary by developmental level, and how previous organized sport participation related to their performance in the 60m sprint. Results pertaining to the first study objective that are worth highlighting were that the track and field sprinting had the highest frequency and PSP followed by soccer, hockey, basketball, and volleyball. These findings were not surprising because the sample consisted of university sprinters, and the other most common sports in these participants also have the highest participation rates nationally (Canadian Fitness Lifestyle Research Institute, 2022) among children aged 5 to 17 (soccer = 28%, basketball = 17%, hockey or ringette = 16%), and aquatic activities (16%). Results on PSP (especially quantities of involvement and years) in our study signalled that participants did not generally begin to engage highly in formal sprinting until after age 13; and that they participated in the most sports (46% of the total) and had the highest PSP (48% of the total) during ages 8-13. These findings generally reflected sampling (deliberate play in several sports) as recommended by the Developmental Model for Sports Performance (Cote et al., 2009; Côté & Vierimaa, 2014) and others (e.g., Gullich et al., 2025) for children and youth.

Noteworthy results relative to the second study objective were that, while participation in track and field sprinting (60m) increased consistently across the age periods to peak during university; the frequency and level of PSP dropped significantly overall and between each of the three developmental age groups; and this drop was particularly evident in sports other than track and field sprinting. The decreases in PSP across age periods reflect existing research on sport in children and youth. For example, Hyde et al (2020) reported that sport participation in the United States involved 61.1% of those aged 10 to 13 and declined to 55% in those aged 14 to 17. Our results also revealed that, overall and until age 18, those who participated in 60m sprinting were somewhat less prone to participating in other sports (and vise versa); and 84% of those aged 14 to 17 had high levels of involvement in track and field sprinting signaling some degree of specialization. These results may have some relationship to the findings of Bell et al. (2016) that 25% - 48% of high school student-athletes had high specialization levels, 26% - 32% of students had moderate specialization levels, and 26% - 43% low specialization levels.

The results discussed previously also generally align with the Developmental Model of Sport Participation recommendations (Cote et al., 2009; Côté & Vierimaa, 2014) that, after sampling multiple sports before age 13 (with rare early specialization in a few sports), athletes may begin to specialize (i.e., deliberate play and practice are balanced; reduce involvement in several sports) more from ages 12 to 14, and some may choose to invest in higher intensity deliberate practice in potentially one sport from ages 14 to 17. Those in this study appeared to specialize in their sport of choice later than the DMSP recommended age of 12-14 and this appears to corroborate the prescription of track and field as a relatively late specialization sport (ages 12 - 16 or later) with event-specific specialization occurring as late as age 18 – 30 (Huxley et al., 2017; Kearney et al., 2021). University sprinters in this study may have delayed specializing in sprinting somewhat later than the DMSP recommended age of 12-14 for most sports may be because of the advantages to doing so such as self-regulating environmental factors (e.g., wind, temperature, the track surface), knowing important technical elements, along with experience, biomechanical locomotion efficiency, physical determinants, and inherited genetic characteristics such as muscle fiber composition (Duffy et al., 2006; Philips, 1997). For example, Majumdar and Robergs (2011) report that approximately 50% of speed and power success is due to inherited genetic factors and that each person will have a natural genetic make-up of either more type II (fast twitch) muscle fibers or type I (slow twitch) muscle fibers. Sprinting performance is also dependent on peak strength velocity that peaks approximately one year after a person reaches their peak height velocity that is typically around age 13 for females and 15 for males (Goncalves et al., 2012).

Findings of this study related to the third objective (how previous organized sport participation related to their performance in the 60m sprint) revealed that PSP did not statistically relate to or predict sprint performance overall or by developmental level. After age 13, correlations increased to low-to-moderate levels signaling that the PSP-sprint performance relationship appears to become stronger after age 13 which may be related to the increases in physiological maturation and participation and specialization in track and field sprinting at that age. For example, while investigating such influential factors and possible pathways to success, Huxley et al (2017) noted that specializing later and continuing to be involved in other sports well into adolescence, was beneficial to success at the senior level. On the other hand, the lack of a stronger relationship between PSP and sprinting performance may be partly due to variations in sprinting between track and field and other sports (e.g., soccer, football, basketball, rugby) that also require running at maximal speeds. For example, Kawamori et al. (2013), noted that track and field athletes have better than normal ground reactive forces because of differences in the sprint technique for these (e.g., running posture and height of foot during recovery), starting from a standing position or crouched in blocks, and biomechanical differences in step length and the knee and hip angles during push-off and in the initial 10-meters. Interestingly, Gullich et al. (2025) analysis of 5923 samples and over 1,142,000 world class performers (i.e., athletes, chess players, musicians, and academics) highlighted that:

> The available evidence is highly consistent across domains: (i) Young exceptional performers and later adult world-class performers are largely two discrete populations over time. (ii) Early (e.g., youth) exceptional performance is associated with extensive discipline-specific practice, little or no multidisciplinary practice, and fast early progress. (iii) By contrast, adult world-class performance is associated with limited discipline-specific practice, increased multidisciplinary practice, and gradual early progress. (p. 1245)

We acknowledge some limitations of this study. First, although the sample size was adequate for the statistical analysis performed in this study, it was smaller than hoped for due to the Covid pandemic. For example, some of the university track and field coaches that were contacted about the study responded by stating that they did not want their athletes to participate in the study due to the additional stressors of the pandemic. Second, although there may be some unwanted variance due to the addition of five sprinters from the USA, this was considered to have a negligible effect on the overall sample because of the strong similarities between these nations, the sporting opportunities they provide children and youth, and the sound validity and reliability of sprinting speed in each. Third, it is also important to note that including two 60m hurdlers with the sample of sprinters may have added some unwanted variance to the findings because 60m hurdling involves significant expertise beyond 60m sprinting. We believe, however, that this potential confound was negligible because only two of the thirty-four 60m sprint speed participants in this study were hurdlers and both the 60m hurdles and 60m sprint are robust indicators of sprinting speed.

In conclusion, the findings of this study contribute new insight to existing knowledge about participation, sampling, and specialization in sport by illuminating the potential role of PSP across different developmental levels and how it relates to performance results in university 60m sprinters. The findings revealed a peak of sport participation and sampling during the younger ages (8-13 years-of-age) and a steady decrease thereafter, an affirmation of previous research suggesting that track and field sprinting is generally a late specialization sport. Future studies should increase the sample size of this study as doing so could reveal statistically significant relations between PSP and sprinting performance at certain developmental levels. Subsequent research should also expand the pool of participants to include more sprinting events (e.g., 100m and 200m sprint and hurdles), and potentially comparing these sprinters to athletes in other related track and field events (e.g., long and triple jump) and in other individual (e.g., running, rowing, gymnastics, cycling, and/or racquet sports) and team sports (e.g., soccer, hockey, basketball, volleyball, and/or football). Doing so will add more insight into how sprinting participation and performance can be jointly and appropriately developed with other track and field events and fundamental movement skills, (e.g., running, jumping, and throwing) that are transferable to other sports, physical activities, health, and well-being (Coyne et al., 2019).

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