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## A Comparison of Developmental Activities of Elite Athletes Born in Large and Small Cities

*Étude comparative des activités favorisant le développement d'athlètes élite nés  
dans des petites villes et des grandes villes*

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### **Abstract**

The purpose of this study was to compare organized and non-organized sport activities of 41 Canadian Interuniversity Sport (CIS) athletes from different birthplace sizes ( $n_{\text{small city}}=18$ ;  $n_{\text{large city}}=23$ ). A retrospective semi-structured interview was used to collect developmental sport activities of athletes. Results revealed that athletes born in small cities participated in significantly more non-organized sport activities and significantly less organized sport activities than athletes from large cities. No significant differences were found between the athletes when comparing total number of sport hours. Findings from this study provide evidence that varying developmental activities can lead to elite athlete development.

### **Résumé**

*Cette étude visait à comparer les activités sportives organisées et non organisées auxquelles s'adonnaient 41 athlètes de Sport interuniversitaire canadien (SIC) selon la taille de leur lieu de naissance ( $n_{\text{petite ville}} = 18$ ;  $n_{\text{grande ville}} = 23$ ). Des entrevues rétrospectives semi-dirigées ont été réalisées avec les athlètes pour recueillir des données sur leurs activités de développement. Les résultats ont révélé que les athlètes issus de petites villes s'adonnaient nettement plus à des sports non organisés et nettement moins à des sports organisés que leurs homologues des grandes villes. Par contre, on n'a constaté aucun écart significatif d'un groupe à l'autre quant au nombre total d'heures consacrées au*

*sport. Les résultats de l'étude révèlent que le développement initial des athlètes élite peut être associé à divers types d'activités sportives.*

### **Introduction**

It has been hypothesized that contextual factors associated with an athlete's place of birth may influence the achievement of elite level sport (Côté, MacDonald, Baker, & Abernethy, 2006). Previous studies have investigated the birthplace effect in North America, Australia, and Europe across a number of sports (e.g. basketball, baseball, cricket, golf, American football, ice hockey, rugby, and soccer; for a review see MacDonald & Baker, in press). Generally, studies conducted in North America show that professional athletes born in smaller cities were overrepresented, while those born in larger city centres were underrepresented (Côté et al., 2006; MacDonald, Cheung, Côté, & Abernethy, 2009). For example, Côté et al. (2006) analyzed the birthplace of 2,240 North American professional athletes. The distribution of the athletes' birthplaces across various city sizes was compared to similar aged individuals using American and Canadian census data. It was found that professional athletes born in city sizes greater than 500,000 were less likely to achieve elite athletics when compared to those individuals born in communities of less than 500,000. MacDonald et al. (2009) utilized a similar methodology and compared the birthplace city sizes of professional players from the National Football League (NFL) to similarly aged individuals from American census data. Consistent with Côté et al.'s (2006) data, individuals born in smaller cities (< 500,000) had a greater likelihood of achieving elite level status in American football compared to athletes born in larger cities (> 500,000).

Previous work has postulated that the physical and psychosocial climate of small and large cities may be contributing to the birthplace effect (MacDonald et al., 2009). MacDonald et al. (2009) suggest that smaller cities may provide athletes with safer environments, increased access to facilities, increased opportunities for skills building, and supportive relationships – factors that positively affect the development of talent in young athletes. These factors impact the developmental activities that young athletes engage in throughout their sport development. For example, smaller communities will naturally provide more opportunities for children to engage in deliberate play activities (Kyttä, 2002) while sport involvement in larger cities may consist of more organized practice and games in an adult-led environment. Deliberate play typically consists of activities that are intrinsically motivating, provide immediate gratification, and are designed with the specific purpose of maximizing enjoyment (Côté, Baker, & Abernethy, 2010; Côté & Hay, 2002). However, the relationship between organized and non-organized sport activities and the birthplace effect is currently unknown.

The Developmental Model of Sport Participation (DMSP; Côté & Fraser-Thomas, 2010) proposes two distinct developmental pathways in sport to achieve elite performance. The two trajectories include varying amounts of organized and non-organized activities during sport development. The first trajectory involves elite performance through early specialization. Young athletes that specialize early often have developmental profiles that include high amounts of deliberate practice, low amounts of deliberate play, and typically focus on one sport. While this early specialization pathway can lead to elite performance, it also has

negative psychological and physiological effects such as burnout and decreased enjoyment in sport (Côté et al., 2007; Wiersma, 2000). The second trajectory involves elite performance through sampling. Sampling occurs between the ages of 6-12 and the developmental profile of these youth athletes involves high amounts of deliberate play, low amounts of deliberate practice, and participation in numerous sports. After the age of 12, elite performers will begin to specialize, and their developmental profiles begin to mimic early specialization athletes.

The purpose of this study is to investigate the relationship between developmental sport activities and city size in elite athletes. Based on previous research (Abernethy & Farrow, 2005; Côté et al., 2006; MacDonald et al., 2009), it is hypothesized that elite athletes from large and small cities experienced different developmental sport activities during childhood (ages 6-12). More specifically, it is expected that elite level athletes from larger cities engaged in more organized activities during childhood while elite level athletes from smaller cities participated in more non-organized activities (e.g. deliberate play; MacDonald et al., 2009). This hypothesis is based upon previous research suggesting that smaller communities are more conducive to participation in non-organized activities and present fewer safety concerns, more accessible play areas, and may have fewer competing leisure activities for youth (MacDonald et al., 2009).

## Method

### Participants

Forty-one male Canadian Interuniversity (CIS) athletes ( $M_{age} = 21.9$ ,  $SD = 2.3$ ) were interviewed. The participants were purposely sampled based on their participation in Canadian Interuniversity sport. Canadian Interuniversity sport constitutes an elite level of sport for which the best Canadian student athletes between the ages of 18-24 are selected. The sample of 41 elite athletes included 34 football players, 2 ice hockey players, 1 basketball player, 1 rugby player, and 1 track and field athlete. The birthplaces of athletes were obtained from the participants during the interview. Twenty-three participants ( $M_{age} = 21.2$ ,  $SD = 3.0$ ) were from large cities ( $> 100,000$ ) and 18 participants ( $M_{age} = 22.7$ ,  $SD = 1.3$ ) from small cities ( $< 100,000$ ). The 100,000 population birth place city size was used as the cut off for the small versus large city distinction as previous research has shown that athletes born in cities with a population less than 100,000 have the best odds of participating in elite sport (Côté et al., 2006, MacDonald et al., 2009, MacDonald, King, Côté, & Abernethy, 2009).

### Data Collection

Retrospective semi-structured interviews were completed in person or by telephone with the athletes. The interview guide was developed based on a retrospective interview procedure (Côté, Ericsson, & Law, 2005). The procedure was adapted to focus on developmental sport activities and to be applicable to the wide range of sports previously mentioned. The modified version of the interview procedure consisted of three sections: (a) demographics, (b) organized sport activities and (c) non-organized sport activities. The demographic section collected information about participant's birth date and birthplace. The second part was divided into two sections. The participant was first asked to recall each individual organized sport activity from ages 6-20. Total involvement in each activity was measured in hours per week and weeks per year. This process was

repeated for non-organized sport activities. The organized sport activities were divided into two separate sections to assist in recall. The first section included developmental sport activities that involved a registration and coach supervision. The second section included organized sport camps. The final section targeted non-organized sport activities and encompassed any non-organized activities done outside of the school setting. This section was comprised of any non-organized physical activities (i.e., street hockey, pick-up basketball) completed outside of the school setting, as well as any non-organized activities completed on the weekends. The total number of developmental sport activity hours was calculated by summing the organized and non-organized activities for each athlete. Previous studies have established the reliability and validity of this method for determining developmental sport profiles (Baker, Côté, & Abernethy, 2003; MacDonald, Horton, Kraemer, Weir, Deakin, & Côté, 2009).

### **Data Analysis**

Data from 6 to 20 years of age were gathered from participants. Although the study only focused on the early developmental stages (6-12 years of age), developmental sport activity history was collected from ages 6-20 years to assist the participants in recollection of their past sporting history. To address the study's purpose, a multivariate analysis of variance (MANOVA) was conducted to compare the developmental activities (organized sport activities, non-organized sport activities, total sport hours) between athletes from large and small cities.

### **Results**

Table 1 displays the developmental activity means for the athletes from large and small city sizes. Athletes across all cities invested approximately 1000 hours per athlete in sport from ages 6 to 12. MANOVA results revealed a significant difference in developmental sport activities between large and small city centre athletes [ $F(1, 39) = 14.67, p < 0.05$ ].

Table 1  
*Mean Hours of Developmental Activities of Different Athlete Birth Place City Sizes*

	Small (n=18)	Large (n=23)	Total (n=41)
Organized Sport	594.9 (295.1)	922.9 (267.7)	778.9 (321.9)
Non-organized Sport Activities	436.0 (203.9)	232.0 (235.1)	321.6 (242.0)
Total Hours of Organized and Non Organized	1030.9 (325.7)	1154.9 (449.4)	1100.4 (400.1)

Follow-up univariate ANOVAs (see Table 2) revealed large city centre athletes participated in significantly greater amounts of organized sport activities than smaller city centre athletes [ $F(1, 39) = 13.86, p = 0.001$ ]. In addition, small city centre athletes were found to participate in significantly greater amounts of non-organized sport activities than larger city centre athletes [ $F(1, 39) = 8.53, p = 0.006$ ]. No significant differences were found between the athletes when comparing total number of sport hours.

Table 2  
*Univariate ANOVA for Non-organized Sport, Organized Sport, and Total Sport Hours*

	SS	F	p
Non-organized Sport Activities	420220.1	8.53	.006*
Organized Sport Activities	1086208.0	13.86	.001*
Total Hours of non-organized and Organized Sport Activities	155211.7	.969	.331

\*significant at  $p < .05$

### Discussion

The purpose of this study was to compare the developmental activities of elite athletes born in large and small cities. Athletes in all city sizes reported approximately 1000 hours (3-4 hours a week) of sport involvement per athlete during childhood. This is consistent with other retrospective studies of elite athletes that characterize childhood as a period of gradual involvement in sport instead of an intensive period of training (Baker et al., 2003; Berry, Abernethy, & Côté, 2008). Interestingly, present findings indicated that athletes born in smaller city centres experience a much different sporting profile during the early years (6-12) in comparison to athletes born in larger city centres. Small city athletes participated in more non-organized activities than athletes from large city centres. This finding supports our hypothesis and suggestions made by certain authors (Côté et al., 2006; MacDonald et al., 2009) in which athletes from small cities are involved in more non-organized sporting activities during childhood than athletes from bigger cities. These results contradict previous research by Ward, Hodges, Williams, and Starkes (2004) who reported that early specialization with sole involvement in activities that are aimed at improving performance (i.e., deliberate practice) during preadolescence as the most effective path toward the development of elite performance in soccer.

The study findings provide, for the first time, evidence that may explain the birthplace effect observed in North American and Australian elite sports (Abernethy & Farrow, 2005; Côté et al., 2006; MacDonald et al., 2009). Because of the nature of the comparison group used in the present study – elite athletes that are from large and small cities – it is beyond the scope of this study to discern whether non-organized activities are more beneficial than organized activities to foster development during childhood. Nevertheless, studies indicate that intense involvement in organized training during childhood is more likely to lead to dropout and injuries (Fraser-Thomas, Côté, & Deakin, 2008; Law, Côté, & Ericsson, 2007). The sporting environment of small cities may provide an indirect advantage to a larger number of young athletes who can be selected for more intensive training during adolescence.

The current results are also supportive of a trajectory towards elite performance in sport that involve high amounts of non-organized sport activities during childhood as suggested by the sampling years of the Developmental Model of Sport Participation (Côté & Fraser-Thomas, 2010). The present findings indicate that during childhood young athletes do not necessarily need to participate in high amounts of organized sport in order to become elite athletes – as long as the organized sport activities are replaced by an equivalent amount of non-organized sport activities. For developing athletes, time spent engaging in non-organized activities during childhood should be viewed as complimentary to participation in a structured sport environment and beneficial to the attainment of expertise in sport.

While the present study offers an initial step toward better understanding the impact of contextual factors and developmental sport activities on achieving elite level sport, the study has several limitations that will need to be considered when conducting future research. First, the size and homogeneity of the sample (i.e., majority of the sample were football players) is a limitation. A selection of a broader range of sport types (e.g., interdependent and independent athletes) as well as a larger sample would improve the ability to generalize future findings.

Second, although the reliability and validity of retrospective recall has been established (Baker et al., 2003; MacDonald et al., 2009), due to the nature of the study there may be some concerns regarding the ability of the athletes to accurately recall the number of non-organized sport activity hours in which they participated. Although the athletes did not report any issues, future research should employ additional strategies to triangulate the findings and address this limitation. One example would be to collect the youth sport activity information from multiple sources (e.g., parents and athletes) and compare the level of agreement.

Based on previous study findings, coaches and practitioners are encouraged to promote non-organized activities to their athletes as an important, complimentary means of skill development. The integration of non-organized activities into youth athletes' developmental sport profiles has been shown to provide an alternative pathway to obtaining sport expertise. Coaches and practitioners should also consider implementing practice plans that include more non-organized themed activities that are less structured, intrinsically motivating, maximize enjoyment, and provide immediate gratification (Berry et al., 2008). Providing more opportunities for non-organized activity may decrease some of the negative physiological and psychological effects (e.g. burnout, injuries) of intense youth sport involvement while building sport specific skills. Further research is needed to replicate the study findings and explore in greater depth the role of smaller cities and non-organized activities in elite athlete development.

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