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Title: The influence of date and place of birth on youth player selection to a National Football Association elite development programme

Key words: Talent identification, talent development, football, relative age effect, place of birth

The influence of date and place of birth on youth player selection to a National

Football Association elite development programme

Abstract:

Aim: This study sought to examine whether the place and date of birth of elite youth Irish footballers influences their selection onto the Football Association of Ireland's primary development pathway; 12 regional centres of excellences called the 'Emerging Talent Programme' (ETP). The proposed hypothesis was that players born earlier in the year would be over represented compared to those born later in their age band. A secondary hypothesis was that access to the ETP would be independent of place of birth. *Methods*: The dates and place of birth of all elite youth footballers (n=1940) selected onto the ETP since its inception were examined. Chi-squared tests were used to establish if the dates of birth differed from the expected population distribution. Odds ratios were used to identify spatial variation in relation to place of birth and talent production. *Results*: The results showed that admission to the Emerging Talent Programme is not independent of quarter of birth ($p<.05$, $\chi^2 = 256.817$, w= .388). Place of birth analysis showed an unequal geographical distribution of players gaining selection onto the ETP. Selection onto the ETP was not independent of place of birth ($p=<.05$, $\chi^2 = 149.457$, w=.278). Footballers developed in counties that had an ETP centre were almost 50% more likely to gain selection than those without a centre (OR 1.455, 95% CI 1.314 – 1.612). *Conclusion*: The current programme demonstrates

inequitable distribution of opportunities to access elite development pathways due to biases related to date and place of birth.

Introduction

Talent identification and development in high level sport is a complex process and is typically compounded by the need to recognise that talented athletes are influenced by an array of multidimensional considerations (Bailey et al., 2010; Baker & Horton, 2004; Williams & Reilly, 2000). Identifying, selecting and involving the most promising talent in a programme that facilitates their long-term development is the central tenet of organised talent development programmes (Güllich, 2013). Indeed success in elite sport is dependent upon the correct identification and selection of athletes / players (Vandendriessche et al., 2012). Due to the lack of discrete objective measures of performance in football and the low predictive value of future performance of a number of these variables (see Williams & Reilly, 2000), talent identification is a challenging concept.

Relative age effect and place of birth

The environmental and sociological conditions experienced by an elite youth player are important determinants of success (Hayman, Polman, Taylor, Hemmings, & Borkoles, 2011). Tannenbaum (1983) identified these environmental, cultural and sociological factors as being some of "*the links between promise and fulfilment*" (p. 95). Two of these factors that impact on this link are relative age and place of birth (Bruner, Macdonald, Pickett,

& Côté, 2011; Côté, Macdonald, Baker, & Abernethy, 2006). The relative age effect (RAE) refers to a preference for selecting athletes born earlier in the age-band due to enhanced maturational factors (Baxter-Jones, 1995). A tendency exists within youth football to select players for youth teams who are born early in the selection period (Augste & Lames, 2011). Within association football (soccer), a relative age effect has been identified in a number of countries (Augste & Lames, 2011; Gil et al., 2013; Ostapczuk & Musch, 2013), at club level (Helsen, Van Winckel, & Williams, 2005; Skorski, Skorski, Faude, Hammes, & Meyer, 2016), international level (Glamser & Vincent, 2004; Helsen et al., 2005), and professional level (Ostapczuk & Musch, 2013) resulting in the potential for talented players to be overlooked (Gutierrez Diaz del Campo, Pastor-Vicedo, González-Víllora, & Contreras Jordan, 2010). The percentages of elite youth footballers born in the first half of the year have been reported as between 55-70% (Gil et al., 2013; Hirose, 2009; Saether, 2016) and 70-80% (Carling, le Gall, Reilly, & Williams, 2009; González-Víllora, Pastor-Vicedo, & Cordente, 2015). The advanced physical (Delorme & Raspaud, 2009; Gil et al., 2013), cognitive (Bisanz, Morrison & Dunn, 1995; Jimenez & Pain, 2008) and social (Dhuey & Lipscomb, 2008) development of these older players can lead to an increased propensity for this relatively older population to be chosen for representative squads and teams. Using these factors as markers for potential future performance can result in a biased view of 'potential', lead to greater training opportunities and can facilitate recruitment into advanced teams or structures for earlier maturing individuals (Delorme, Boiche, & Raspaud, 2010; Mikulič, Gregora, Benkovský, & Peráček, 2015; Saether, 2016).

Theories of development emphasise the importance of the synergistic relationship between environmental and individual characteristics for elite development (e.g. Baker & Horton, 2004; Weissensteiner, Abernathy, &

Farrow, 2009). A number of researchers have examined the spatial patterns of talent production (Bruner et al., 2011; MacDonald, Cheung, Côté, & Abernethy, 2009; Woolcock & Burke, 2013) which appears to be an important environmental characteristic for elite performance (Côté et al., 2006). The spatial dimensions of sport include; the distribution of players and clubs, availability of facilities, league competitions, community affiliations and the effects of socio-spatial processes (McGowin, 2010; Rossing, Nielsen, Elbe, & Karbing, 2016). These differing developmental contexts and environmental and institutional processes can shape sporting landscapes and player production (Baker, Schorer, Cobley, Schimmer & Wattie, 2009; Woolcock & Burke, 2013). MacDonald et al. (2009) suggest that *"the birthplace effect is powerful and systematic and plays a significant role in sport expertise"* (p. 236). The notion being that the spatial landscape is a key consideration for the equity of any Football Association and its constituent members as organisational processes can shape these landscapes and influence player development (e.g., through the location of 'centres of excellence' in certain areas).

The opportunities afforded to the development of expertise and playing standards between smaller and larger cities differ (MacDonald et al., 2009). Smaller cities and towns have been reported to provide unique advantages in terms of talent development environments, expertise development and opportunities (MacDonald et al., 2009; Weissensteiner, Abernathy, & Farrow, 2009). Specifically, smaller cities and towns tend to provide more opportunities for play (as street and traffic danger is reduced), greater social networks and development of social and motor skills (Baker et al., 2009; Evans, 2006). Curtis and Birch (1987) suggested further exploration of the accessibility of resources in relation to population (the ideal appearing to be a community that is large enough to have facilities but not so large that demand outweighs participation

opportunities for youth athletes). Côté and colleagues (2006) advanced the theory of differing psycho-social and physical environment conditions experienced by athletes from large urban centres and smaller rural locations, suggesting that the more informal and familiar environment is more conducive to success and to lower levels of dropout (Imtiaz, Hancock, Vierimaa, & Côté, 2014). Limited sporting opportunities can create a stronger cultural norm for dominant sports in smaller communities (Rossing et al., 2016). There may also be per head of capita less elite teams in larger areas than smaller cities resulting in greater opportunities to make these squads and thus becoming visible to scouts when based in these smaller cities (Curtis & Birch, 1987).

There also exists a complex interrelationship between relative age effect and place of birth. Grondin, Deshaies and Nault (1984) showed that the level of RAE was stronger in cities where more players were available to form teams and compete for those places. In effect, the larger the potential pool of players, the larger the resulting effect of unequitable distribution with an over representation of those players born earlier in the year (Musch & Grondin, 2001). Turnnidge, Côté and Hancok (2014) and Bruner et al. (2011) found no relationship between place of birth and relative age effect. Progressing from macro to micro environments, in their study of youth soccer in Spain, Jimenez and Pain (2008) found a stronger RAE in clubs regarded as being successful, from big cities and/or with a reputation for their youth teams. Differences in availability of players due to geographical setting, population levels and competition between clubs can influence the variety of birth date distribution across clubs (Jimenez & Pain, 2008).

Youth development in the Republic of Ireland

The Football Association of Ireland (FAI) is the governing body for the sport of association football (soccer) in the Republic of Ireland. Youth development within Irish football begins within the structures of the 32 Irish school-boy leagues. This occurs on average between the ages of seven to nine (Doyle, Finnegan, & McArdle, 2013). In November 2006, the FAI launched the Emerging Talent Programme (herein known as ETP) on a phased basis which is now a nationwide programme. The appropriateness of the ETP is to adequately develop an elite pool of youth Irish footballers; a key consideration for the FAI (Delaney, 2012). The ETP consists of 12 regional centres (figure 1), which are fed by 32 league centres, and it is the primary development vehicle for elite youth footballers aged 14-17 years. The ETP is financed and organised by the Football Association of Ireland with the stated purpose of providing emerging talent with a more challenging level of training and development. Players also have the opportunity to train within their own geographical area in a structured and quality environment, it allows national team training themes and styles of play to be developed countrywide, and provides a higher quantity and quality of players for national and international teams (Football Association of Ireland, 2009). According to the FAI (2009), the programme is benchmarked against worldwide practice and is their premier training programme for elite players nationwide.

The FAI CEO John Delaney commented on the appropriateness of the ETP saying "*There was much comment during the week about how we need a system to produce upcoming international players. We have one – and it is actually working"* (as cited in Egan, 2013). Despite this assurance, no previous attempt has been made to examine the social and environmental

facets of talent development in Ireland. For example, identifying a bias for selecting players born earlier in the competitive year, tracking the spatial dimensions of talent selection in Irish football, or identifying areas where players are being disproportionately produced. It is argued that understanding the link between the developmental environment of sport and expertise can provide insights into best practice of sport system design and organisation (MacDonald et al., 2009). These '*when'* and '*where'* contextual factors have a lasting effect on initial exposure to sport, commitment to the sport, and chances of attaining elite levels of performance (Côté et al., 2006).

The primary aim of this paper is to examine the nature of the provision of elite training facilities in youth football in Ireland, by examining whether the place and date of birth of elite youth Irish participants influence their selection onto the FAIs primary development pathway; the Emerging Talent Programme. A secondary aim was to identify if having a centre of excellence in their country influenced a players probability of gaining selection onto that development pathway. The proposed hypothesis was that players born earlier in the year would be over represented compared to those born later in their age band. A secondary hypothesis was that access to the ETP would be independent of place of birth.

Figure 1: Ireland map showing the location of the 12 ETP centres (source: Football Association of Ireland, 2013)

Methods

Ethical approval

Full ethical approval for this study was granted by the Research Ethics Committee of a University (full details given in non-anonymised version).

Participants

The sample consisted of (n=1936) fourteen year old, elite youth male football players who had been selected onto one of the 12 regional ETP centres (figure 1) in the Republic of Ireland, by FAI regional staff. This was the entire sample of players that had been represented on the ETP since its inception in 2006 to 2012 (birth years of 1992 – 1998).

Procedure

Upon request from the lead author, the FAI's national co-ordinator of the ETP voluntarily provided the data set from the ETP registration data. The participant information was generated by each regional centre, who are required to submit player details to the FAI ETP coordinator following each new cohorts (annual) entry onto the programme in September. The data-set included date of birth, home county address and club of each player.

Statistical analysis

For the date of birth analysis, Delorme et al. (2010) recommended that researchers use birth dates statistics of all of the youth licenced football players within the sport to calculate the expected distribution of birth-dates. The FAI do not currently record the number of youth football players in Ireland, therefore the national birth rates were used to access distribution. As there is some evidence to suggest variability in the birth rate across the seasons in many countries (James, 1990), the expected birth-date distribution statistics were collected from the national Irish Central Statistics Office (CSO) figures using the corresponding months of births for males within the sample years (1992-1998). It is essential to utilise the frequencies of the parent population rather than a uniform distribution to avoid bias (Delorme & Champely, 2015). The percentages of

birth for this sample from the national population are: quarter 1: 24.8%, quarter 2: 25.4%, quarter 3: 25.3%, quarter 4: 24.5%. To correspond to the FAI's administrative cut-off dates, January was selected as the first month of the year and December as the last. Therefore, quarter 1 relates to 1 January – 31 March, quarter 2 relates to 1 April – 30 June, quarter 3 relates to 1 July – 30 September, with quarter 4 referring to 1 October - 31 December.

County address was used a proxy for the place of development for the athlete as this was collected by the FAI at age 14. For the purpose of this paper, it is assumed that this is the best representation of the most likely 'place' of youth development for each player. Relative county and province population statistics and corresponding dates of birth were sourced from the CSO. The twenty-six counties of the Republic of Ireland are initially used as the distinguishing geographic locations, to allow for further coherent analysis of the data; these twenty six counties are then combined into the four provinces of Ireland (Leinster, Ulster, Munster and Connacht). Within these four provinces there are 32 schoolboy leagues.

Analysis was performed using SPSS 21.0 at the $p \leq .05$ level of significance. Descriptive statistics were generated to identify certain patterns of ETP representation. Chi-square goodness of fit tests were conducted to identify potential differences between expected dates of birth versus actual dates of birth in quarter of birth and month of birth (Gil et al., 2013; Raschner, Muller, & Hildebrandt, 2012). Effect size (w) was calculated by taking the square root of the chi-square divided by the number of participants. Cohen (1992) proposed that results of .1, .3 and .5 represents a small, moderate and large effect sizes respectively. Odds ratios were conducted to illustrate the variance between over and underrepresented counties and provinces. The Kolmogorov-Smirnov test ($p \leq .05$) and Levene test ($p \leq .05$) were used

to test for normality. Normal distribution was rejected, which suggested the use of nonparametric statistics.

Results

Relative age effect

A relative age effect is evident, with an unequal distribution of ETP player birth dates across the quarters emerging. Sixty-eight percent of the entire ETP sample were born in the first half of the year, with 'quarter of birth' representation reducing from a peak in quarter 1 (38.2%) down to 12.6% in quarter 4. Figure 2 presents the distributions of the quarter of birth for the ETP players compared to the Central Statistics Office population data for the same sample. A chi-square goodness of fit test was conducted to assess expected versus observed quarter of births. The result showed that admission to the Emerging Talent Programme is not independent of quarter of birth ($p<0.05$, $\chi^2 = 256.817$, w= .388,).

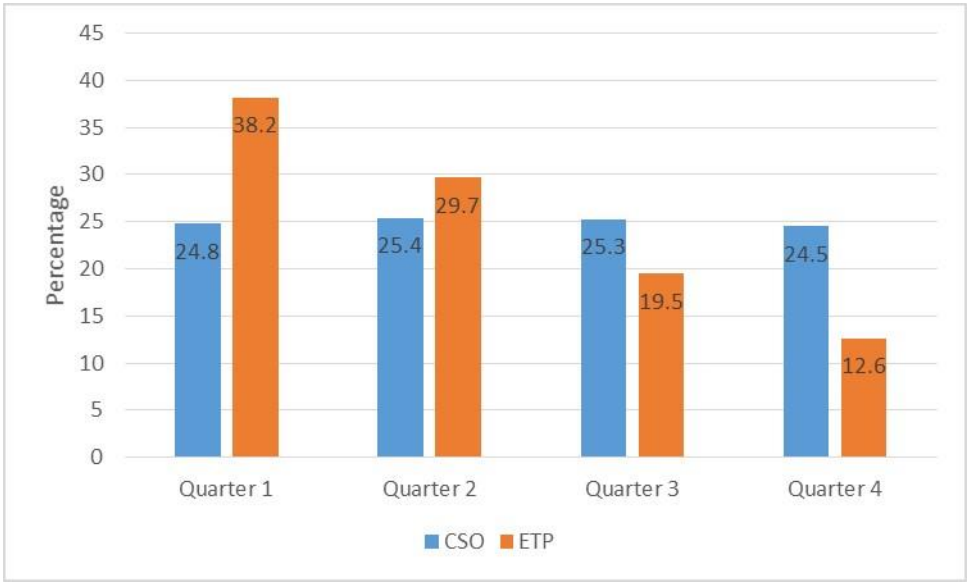

Figure 2: ETP and CSO (relative population) quarters of birth

Further analysis of the breakdown of quarter of birth by individual months (figure 3) using a chi-squared goodness of fit to assess the variance, found a stronger effect than analysing the dates of births in quarter format. ($p<.05$, $\chi^2 = 295.465$, $w= .416$).

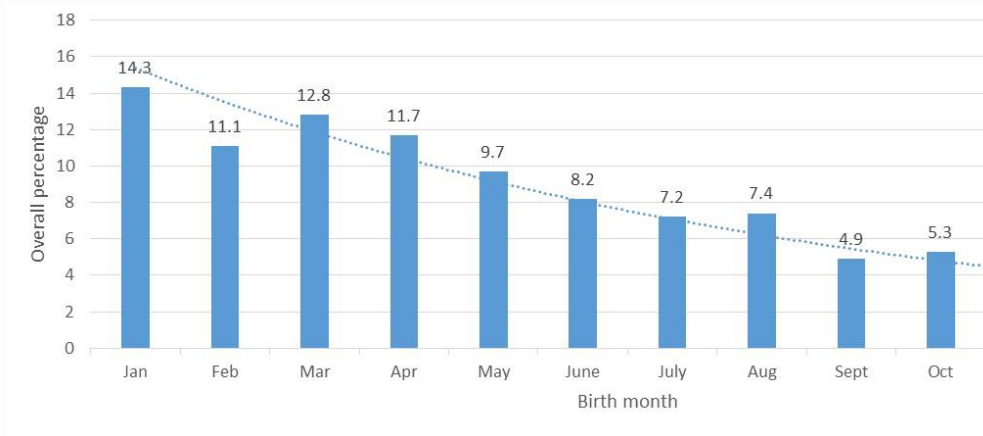

Figure 3: Birth rates per month for the ETP sample

RAE of each of the four provinces were calculated (table 1). Each province displayed a statistically significant RAE ($p < .01$) with moderate to large effect sizes.

Province	Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	χ2	P value	w
Leinster	288 (39.5%)	225 (30.9%)	137 (18.8)	79 (10.8%)	141.118	0**	0.43
Munster	187 (38.6)	129 (26.7)	96 (19.8)	72 (14.9)	61.537	0**	0.35
Connaght	111 (35.8)	100 (32.3)	60 (12.6)	39 (12.6)	44.09	0**	0.37
Ulster	64 (35.6)	53 (29.4)	38 (21.1)	25 (13.9)	19.422	0**	0.32
					**denotes p = <0.01		

Table 1: Quarter of birth in each province

School boy league	Total (%)	Q1 (%)	Q2 (%)	Q3 (%)	Q4 (%)	χ2	P value	w
Athlone	37 (2.17)	16 (43.2)	8 (21.6)	6 (16.2)	7 (18.9)	6.784	0.079	0.42
Carlow	23 (1.35)	9 (39.1)	7 (30.4)	5 (21.7)	2 (8.7)	4.652	0.199	0.4
Cavan/Monaghan	30 (1.76)	9 (30)	8 (26.7)	10 (33.3)	3 (10)	3.867	0.276	0.35
Clare	36 (2.11)	17 (47.2)	8 (22.2)	6 (16.7)	5 (13.9)	10	0.019*	0.52
Cork	89 (5.22)	33 (37.1)	27 (30.3)	16 (18)	13 (14.6)	11.809	0.008*	0.36
DDSL	347 (20.36)	152 (43.8)	100 (28.8)	61 (17.6)	34 (9.8)	90.821	0**	0.51
Donegal	74 (4.34)	28 (37.8)	21 (28.4)	13 (17.6)	12 (16.2)	9.135	0.028*	0.35
Drogheda	11 (0.65)	3 (27.3)	6 (54.5)	1 (9.1)	1 (9.1)	6.091	0.107	0.74
Dundalk	42 (2.45)	18 (42.9)	7 (16.7)	8 (19)	9 (21.4)	7.333	0.062	0.41
Galway	124 (7.28)	44 (35.5)	42 (33.9)	25 (20.2)	13 (10.5)	20.968	0**	0.41
Inishowen	55 (3.23)	19 (34.5)	17 (30.9)	13 (23.6)	6 (10.9)	7.182	0.066	0.36
Kerry	76 (4.46)	35 (46.1)	13 (17.1)	14 (18.4)	14 (18.4)	18	0**	0.48
Kildare	20 (1.17)	4 (20)	7 (35)	6 (30)	3 (15)	2	0.572	0.31
Kilkenny	37 (2.17)	14 (37.8)	14 (37.8)	8 (21.6)	1 (2.7)	12.405	0.006**	0.57
Limerick county	24 (1.41)	8 (33.3)	9 (37.5)	2 (8.3)	5 (20.8)	5	0.172	0.45
Limerick desmond	36 (2.11)	17 (47.2)	6 (16.7)	9 (25)	4 (11.1)	10.889	0.012*	0.5
Limerick district	54 (3.17)	16 (29.6)	16 (29.6)	11 (20.4)	11 (20.4)	1.852	0.604	0.18
Longford	26 (1.53)	8 (30.8)	6 (23.1)	6 (23.1)	6 (23.1)	0.462	0.927	0.13
Mayo	81 (4.75)	25 (30.9)	26 (32.1)	14 (17.3)	16 (19.8)	5.568	0.135	0.26
Midlands	42 (2.47)	18 (42.9)	16 (38.1)	5 (11.9)	3 (7.1)	16.476	0.001**	0.62
NDSL	44 (2.58)	20 (45.5)	13 (29.5)	8 (18.2)	3 (6.8)	14.364	0.002**	0.57
NEC	35 (2.05)	14 (40)	6 (17.1)	8 (22.9)	7 (20)	4.429	0.219	0.35
North Tipperary	26 (1.53)	9 (34.6)	8 (30.8)	6 (23.1)	3 (11.5)	3.231	0.357	0.35
Roscommon	33 (1.94)	13 (39.4)	11 (33.3)	6 (18.2)	3 (9.1)	7.606	0.055	0.4
SDFL	6 (0.35)	2 (33.3)	1 (16.7)	1 (16.7)	2 (33.3)	0.667	0.881	0.33
Sligo/Leitrim	51 (2.99)	18 (35.3)	17 (33.3)	12 (23.5)	4 (7.8)	9.627	0.022*	0.43
South Tipperary	39 (2.29)	18 (46.2)	10 (25.6)	10 (25.6)	1 (2.6)	14.846	0.002**	0.61
Waterford	71 (4.17)	23 (32.4)	23 (32.4)	16 (22.5)	9 (12.7)	7.592	0.055	0.32
West Cork	12 (0.70)	3 (25)	4 (33.3)	3 (25)	2 (16.7)	0.667	0.881	0.23
Wexford	58 (3.40)	20 (34.5)	23 (39.7)	11 (19)	4 (6.9)	15.517	0.001**	0.51
Wicklow	56 (3.29)	16 (28.6)	22 (39.3)	11 (19.6)	7 (12.5)	9	0.029*	0.4
WWEC	9 (0.53)	2 (22.2)	4 (44.4)	1 (11.1)	2 (22.2)	2.111	0.55	0.48
					*denotes p = <0.05		**denotes	

Table 2: Quarter of birth in each schoolboy league

Each of the 32 leagues were then analysed further, of particular note is the largest school boy league in the country, the Dublin District schoolboy league (DDSL), which demonstrates a stronger effect size than the overall sample and of any other league ($p<.00$, $\chi^2 =90.82$, $w=.512$) (see table 2). Fourteen out of the 32 leagues were deemed to have an RAE present (if effect size between county and relative age was statistically significant at the $p \leq .05$ level and was not an association likely to be driven by sample size ($w \geq 0.3$). Nine of those fourteen schoolboy leagues house an ETP centre, whereas the remaining three centres are in counties which didn't display a significant RAE.

Place of birth

Using the four provinces as distinguishing geographical locations, a chi squared goodness of fit using expected distribution (from CSO data) was conducted. This demonstrated that selection onto the ETP was not independent of place of birth ($p<0.05$, $\chi^2 = 149.457$, w=.278). As can be seen in table 3, Leinster is underrepresented on the ETP in relation to its CSO statistics when compared to the overall sample (OR .767, 95% CI .706-.834), with the remaining provinces overrepresented. Population bases per centre vary between provinces, with Leinster having 15,462.4 boys per centre catchment area to Connaught who have 8715.5 boys to each centre.

Province	ETP centres (%)	CSO (%)	Feeder population per 1 centre	ETP (%)	Expected number	Residual difference
Leinster	5 (41.6)	77312 (53.59)	15462.4	799 (41.3)	1037.5	-238.5
Munster	4 (33.3)	39695 (27.52)	9923	597 (30.8)	532.7	64.3
Connaght	2 (16.7)	17431 (12.08)	8715.5	327 (16.9)	233.9	93.1
Ulster	1 (8.3)	9824 (6.81)	9824	213 (11)	131.9	81.1
Total	12	144,262		1936	1936	

Table 3: Representation by province on ETP

Odds ratios were calculated on the likelihood of gaining selection into a centre; dependant on whether that county had an ETP centre based there. Populations within counties that had a centre were almost 50% more likely to gain selection than those without a centre (OR 1.455, 95% CI 1.314 – 1.612). The odds ratio of each county relative to the overall sample in terms of gaining selection were then assessed. As can be seen in table 4, Donegal and Kerry have the highest odds with Leitrim, Kildare and Dublin having the lowest odds. Due to the high number of counties involved, a comparison of counties Donegal and Dublin was highlighted as this represents two counties from an A and an E category in terms of difference between relative population and ETP representation (as they are seen in table 4). This analysis shows that 2.933% of the relative Donegal population

got a place on the ETP compared to 0.767% of the relative Dublin population (OR 3.911, 95% CI interval is 3.217-4.754), thus highlighting unequal access onto the programme across counties. Using the ordering of counties in terms of odds from table 4 to create A-E grouping, these were then plotted on a map of Ireland (figure 4).

Category	County	% in ETP	% in CSO	% total pop on ETP	Odds Ratio
A	Donegal*	8.209	3.7577	2.933	2.22
A	Kerry*	5.885	3.07496	2.570	1.938
A	Longford	1.446	0.837	2.318	1.744
A	Sligo	2.633	1.558	2.270	1.706
A	Waterford*	4.182	2.48367	2.261	1.7
B	Mayo*	4.543	2.9	2.103	1.579
B	Limerick*	6.608	4.529	1.959	1.468
B	Wicklow*	4.388	3.05347	1.930	1.446
B	Galway*	7.692	5.63	1.835	1.373
B	Carlow	1.652	1.214	1.828	1.368
C	Roscommon	1.701	1.35	1.695	1.267
C	Westmeath*	2.529	2.0234	1.679	1.255
C	Louth*	3.252	2.692	1.622	1.212
C	Cavan	1.962	1.65046	1.596	1.192
C	Tipperary	3.924	3.58237	1.471	1.097
D	Wexford	3.098	3.1193	1.333	0.993
D	Kilkenny	2.013	2.164	1.249	0.93
D	Laois	1.446	1.60471	1.210	0.9
D	Clare	2.22	2.589	1.151	0.856
D	Meath	3.304	3.9837	1.114	0.828
E	Cork*	7.95	11.2566	0.948	0.7035
E	Monaghan	0.826	1.402	0.791	0.586
E	Offaly	1.033	1.80227	0.769	0.5696
E	Dublin*	15.07	26.39988	0.767	0.5677
E	Kildare	2.168	4.697	0.620	0.458
E	Leitrim	0.258	0.645	0.537	0.397
	* denotes the presence of an ETP centre in the county				

Table 4: Representation by county on ETP

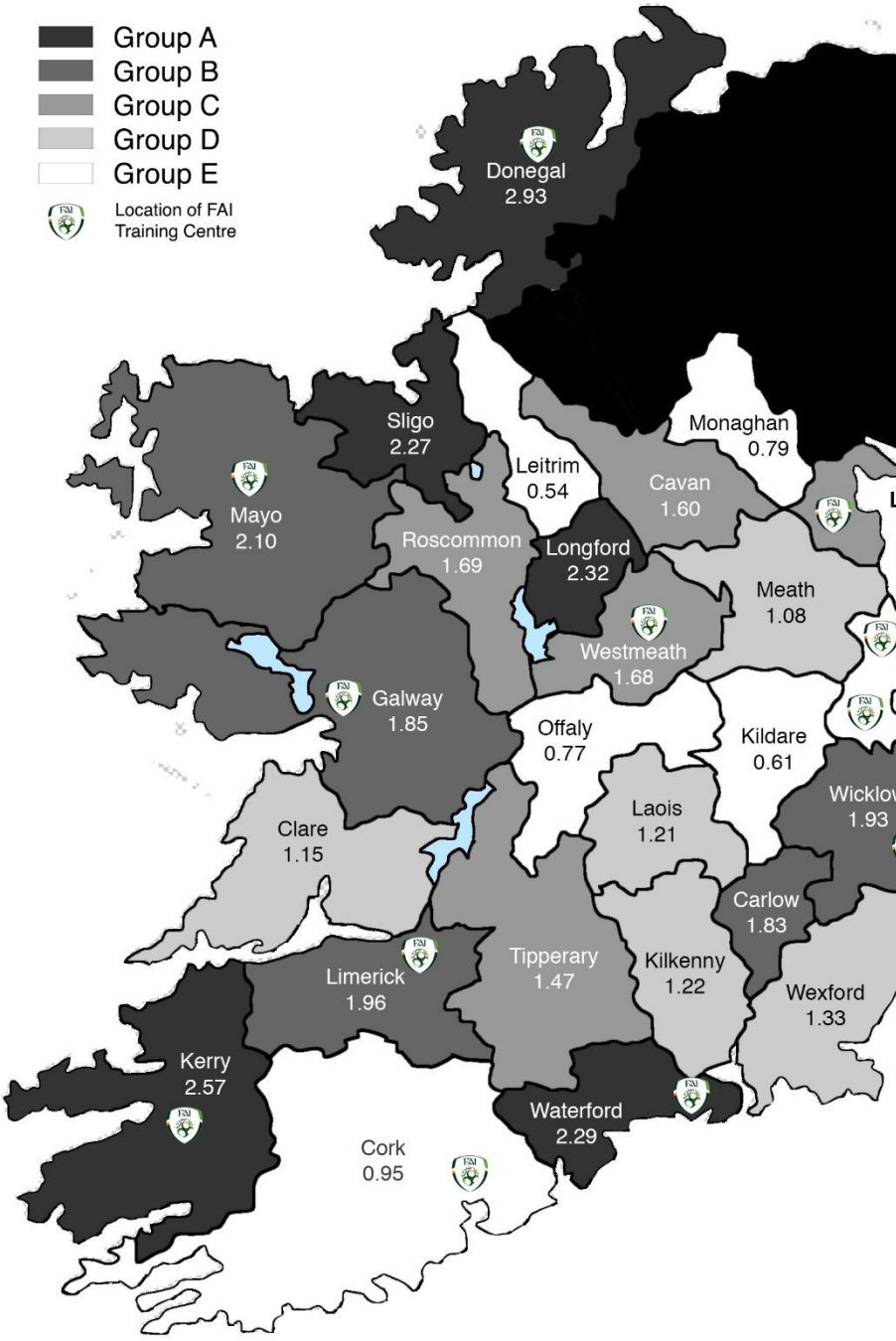

Figure 4: Ireland map with the percentage of each counties total population on the ETP

Discussion

This study sought to identify asymmetries in the birth month and geographical distribution of elite youth Irish footballers, as identified by the Football Association of Ireland. Statistics show an emergence of players born earlier in the year, thereby confirming the presence of a relative age effect in the ETP sample. The results also demonstrate that there is an imbalance of opportunities provided to some elite youth footballers related to place of birth and progression onto the elite development pathway.

Sixty eight percent of the ETP sample were born in the first half of the year (compared to a population birth rate of 50.2% born in the first half of the year). The birth-date distribution was more pronounced than a number of relative age effect studies (Gil et al., 2013; Hirose, 2009), but also showed a slight decrease on other related studies (Carling et al., 2009; Gil, Ruiz, Irazusta, Gil, & Irazusta, 2007). The variation in percentage figures often relate to the level of the sample, with elite squads often having a more prominent RAE (Gil et al., 2013). An even more pronounced relative age effect was found within the DDSL, with 72.6% of the sample born in the first half of the year. This supports Jimenez and Pain's (2008) findings within Spanish youth football, that clubs from greater population densities demonstrated a stronger RAE. Musch and Grondin (2001) suggest that the greater pool of players that are available to clubs may perpetuate the likelihood that they will choose the more relatively physically mature. Dublin has the densest population of any county in the Republic of Ireland (CSO, 2011).

A significant RAE was found to be present in each of the four provinces in Ireland when used as a distinguishing categorisation. Leinster which displayed the strongest effect size also has the largest population density of the four provinces (CSO, 2011) again supporting Jimenez and Pain's (2008) findings regarding greater population densities and strong RAE. When each schoolboy league was individually analysed, 14 out of the 32 leagues had significant RAE, interestingly; nine out of these 14 leagues housed one of the 12 ETP centres. If greater percentages of players are making this programme from these counties this suggests a continued perpetuation of RAE within those counties, with RAE in this case driven by population, density and competition for places onto the ETP. Physical maturity should not necessarily be equated with enhanced skill levels (Hancock, Ste-Marie, & Young, 2013), yet often it is the physically more mature footballer (mass, speed and height) that gets selected onto development teams (Hirose, 2009). This could indicate a biased view of youth footballers' talent potential who are born in the early part of the year (Delorme et al., 2010), and may in part explain the enhanced recruitment of this segment of youth footballers onto the ETP programme.

A range of self-sustaining factors can emerge to further increase the gaps between the older and younger cohorts within the same age band. For example, the continued selection onto representative teams, extra training and elite coaching could provide these athletes with an enhanced performance advantage (Augste & Lames, 2011). Along with parents and athletes, coaches are important social agents of perpetuating the relative age effect (Hancock, Adler, & Côté, 2013) within youth sport. Furley and Memmert (2015) investigated the perceptions of coaches which linked the idea of sport giftedness to physicality. Physically more mature players are more likely to be identified as 'talented', thus get selected for advanced

coaching and training and compete at higher levels of competition such as ETP (Johnson et al., 2009). Success in youth sport can lead to an increased sense of motivation due to the positive and reinforcing nature of feedback obtained from coaches, parents and peers (Ostapczuk & Musch, 2013). Augste and Lames (2011) suggest that this can lead to greater effort and better performance by the athlete. Conversely, de-motivation, resulting from a lack of selection, or the perception of a selection bias, could lead to increased levels of drop out amongst this population (Delorme et al., 2010). This in turn could perpetuate the increased levels of players represented in the first two quarters. The Football Association of Ireland should encourage a number of methods to potentially reduce this bias, for example rotating cut-off dates, thus reducing the constant bias towards relatively older participants, encouraging change within the governing body (Vaeyens, Philippaerts, & Malina, 2005), providing additional support for the younger players during these sensitive development stages (Pierson, Addona, & Yates, 2014) and introducing more frequent entry points onto the programme to accommodate late developers. Lidor, Arnon, Maayan, Gershon, and Côté (2013) suggest that limiting competition amongst youth athletes can moderate RAE, as RAE is reinforced where there is a 'win focus' rather than a long term development mentality (Andronikos, Elumaro, Westbury, & Martindale, 2016).

Population density may also impact selection onto an elite development pathway (Rossing et al. 2016). As can be seen in table 3, the relative population feeding into each centre is higher in Leinster (which has the highest population density of all provinces), yet players from this province have the lowest odds ratio of gaining a place despite having a larger number of centres than the other provinces. A stated purpose of the ETP

is to provide elite youth footballers with the opportunity to train in their own geographical area (Football Association of Ireland, 2009) which does support the location of centres in a wider number of lower population dense areas, however the findings suggest that there is inequity in terms of opportunity for progression onto this programme related to location.

Despite Dublin based players being the most represented within the ETP sample in terms of frequency, relative to population, it had one of the lowest ratios of representation on the ETP. The counties of Donegal and Kerry had the highest relative representation. Players tend to leave their local club to seek enhanced exposure at the age of specialisation, typically to larger cities (i.e. Dublin) (Bourke, 2003), which is consistent with international data (Philips, Davids, Renshaw, & Portus, 2010). Conversely, this data suggests that they may have a better chance of making the ETP programme by staying in the rural locations (e.g., players are almost four times more likely to make the programme being based in Donegal than Dublin). Mackett and Paskins (2008) found that children tend to play more in informal settings, and if the opportunities to engage in these activities are less in higher density areas due to urbanised nature of their environment then players from Irelands largest cities (Dublin and Cork) are missing out in two keys areas of expertise development, namely informal play and formal practice development (Balish & Côté, 2011); Côté, Baker & Abernathy, 2007). Participants from larger cities can be more prone to drop-out, due to these less psychosocially supportive environments (Fraser-Thomas, Côté, & MacDonald, 2010; Imtiaz et al., 2014).

Of the ten highest relatively represented counties, seven of those have Emerging Talent Centres in their counties. Counties such as; Donegal, Kerry, Waterford and Mayo seem to benefit from having one of the twelve regional centres located in their counties (see figure 4). This is due to the

fact that per head of capita there are more opportunities for securing a place on the programme compared to the bigger cities (e.g. Dublin, Cork). Players are almost 50% more likely to secure a place on the ETP if there is a centre based in their county. Therefore, being from a lower density county and having an ETP centre located in a player's county significantly increases the chances of that player gaining selection onto the programme. This corroborates earlier studies which display a link between size of place of birth and talent development (Côté et al. 2006; Rossing et al. 2016). As the presence of elite clubs in a community positively impacts the chances of a player becoming elite (Rossing et al, 2016), this study adds national centres of excellence to the influencing factors of talent development.

Conclusion

This paper examined the influence of place and date of birth with respect to youth elite Irish participants on the Football Association of Irelands primary development pathway; the Emerging Talent Programme. This research has evidenced that opportunities for selection onto an elite football development programme are unequal, and that the likely development and successful progression of young players appears to be hostage to an individual's date and place of birth. A significant RAE is found across all four provinces of Ireland. The FAI should investigate the competitive structures across the country to assess whether these are having an influence on a sustained RAE due to a 'win focus' rather than a long term developmental philosophy being cultivated. The underage competitive calendar currently peaks at a prestigious u14 national cup competition for youth footballers in Ireland. The FAI should discourage such focus on this competition as this could lead coaches to choose more

physically enhanced players and thus reinforce a RAE. The FAI should also assess the ETP structures to allow for greater flexibility of gaining entry onto the programme at a later date rather than relying primarily on scouting at age twelve to widen the talent pool and allow for late-developers.

The evidence from this study also shows that the odds of inclusion in the ETP are significantly varied between counties and is influenced by the presence of an elite training centre within that county. Inequity in relation to boys per centre throughout the country in terms of access is evident. This study raises previously under researched material regarding the location of elite training centres and the allocation of resources. It raises questions over the best practice of the geographical spread of centres on limited resources which as can be seen from this study can limit inclusion from higher density residents. Locating the development centres outside the main conurbations does allow for increased access by rural footballers, but this should be balanced by providing extra centres in the densely populated areas. Opportunities for participants based in urban locations could be further limited by the movement of players towards these areas seeking enhanced playing opportunities and exposure. Football Associations must ensure that although there may be a need to locate these centres in areas related to accessibility, they must also be located in areas relative to population size. The current elite development programme demonstrates inequitable distribution of opportunities to access elite development pathways due to biases related to date and place of birth.

Limitations:

This data was limited by using county address as a proxy for place of development. There also exists no comprehensive data set from the FAI related to participation breakdown per county and per league, thus the lead researcher had to infer relative population groups from Central Statistics Office figures.

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