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**An investigation into the impact of gender on early specialisation in sport**

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**Abstract**

This investigation was carried out with the aim of establishing a potential correlation between a child's gender and early specialisation in sport. 126 subjects took part in the investigation, ranging in age from 14-16 years old. The study itself was quite small scale. All subjects attended a mixture of rural and urban post-primary schools within Northern Ireland.

The subjects completed a questionnaire, created to analyse the overall number and gender of students who have specialised in a single sport. The questions were selected to gauge past and present sport involvement. Males spent 6.1 hours per week participating in sport, whilst females spent 5.6 hours, meaning males participated in more hours of sport than females. All but one of the 126 subjects, 82 males and 44 females, participated in sport. On average, 36% of subjects participate in one sport only. Of this 36%, 52% are female, with 36% being male, meaning more female subjects have specialised in a single sport.

**Key Words**

Gender; Early specialisation; sport; questionnaire; participation; post-primary schools.

**Introduction**

*Background to the study*

In recent years, there has been increased discussion about early specialisation in sport amongst young athletes. The main discussion surrounds the potential impacts, positive and negative, of specialising in sport at a young age. Bradbury and O'Boyle (2017) found the lure of professionalism has produced an incredible increase in early specialisation in sport for children, as to become elite, Sotiriadou and Shilbury (2009) argue, requires early talent identification and specialist coaching. Although Mostafavifar et al (2013) highlight negative effects early specialisation can have on young athletes, such as adverse physical and psychological health. Bompa (2000) reinforces potential dangers the early specialisation pathway may lead to, such as athletes becoming frustrated when their rate of development slows, and by their late teens, many drop out due to fatigue, disappointment, or, due to their rapid rate of development, injuries.

McDonagh and Pappano (2009) found that from a young age, females are encouraged to curtail participation in contact sports, being pushed more towards 'feminine sports' such as gymnastics and ballet, and not care about competing and winning, pointing to the fact that historically, sport for females should be social, for enjoyment and health only, but not competitive. Research by Zipp (2011) found that males are expected to participate more in team sports which are speed and strength orientated, involving physical contact. Schmalz and Kerstetter (2006) believe children change their approach towards sport, impacting upon their participation, attempting to fit the traditional norms of appropriate behaviours, based on gender.

**Citation**

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### *Need for the Study*

Whilst numerous studies have been carried out in Northern Ireland on gender in sport, there have not been many which focus on early specialisation in sport and differences both males and females may experience in this area. The impact that physiological gender differences may have on sport performance and the type of sport played by both genders have been previously acknowledged and will continue being acknowledged in future research. There are multiple countries and scholars persistently trying to explore and discuss the impact of early specialisation on young athletes, but not many have focused on the impact of gender in this area. It is crucial that children are alert to the benefits and experience positive aspects of sport, ensuring they are aware of what early specialisation in sport is, its potential effects and the differences young male and female athletes may experience within this element of sport. As a future teacher specialising in Physical Education, it is hoped that the study will be insightful and generate a basis for future research in this area.

### *Aims and Objectives*

- To establish if gender impacts upon early specialisation in sport, the type of sport specialised in and the age of young athletes when they specialise.
- Children come from a combination of urban and rural post primary schools across NI and have been permitted to take part in questioning procedures by their parents and school principal.
- The questionnaire will relate to involvement in sport.
- Findings will be presented via tables and graphs to provide a conclusion and possible recommendations.

## **Review of Literature**

### *Introduction*

In this Review of Literature research, the subject of early specialisation in sport, along with how gender can impact upon this topic will be observed and investigated. Therefore, gender will be considered in the perspective of how it may affect and contribute to Early Specialisation in sport.

### *Early Specialisation in Sport*

Early specialisation is characterised by Baker et al (2009) as participation in specific, intense training for a single sport at a competitive level at an early age. They also used four parameters to define early specialisation:

1. Early start age in sport.
2. Early involvement in one sport.
3. Early involvement in focused high-intensity training.
4. Early involvement in competitive sport.

Balyi et al (2005) defined early specialisation sports as '*sports in which early sport specific training, from ages 5 to 7, is necessary for future excellence*', which include sports such as diving, figure skating and gymnastics. Balyi et al (2005) explain the rationale behind early specialisation for these sports, stating that complex movement and sport skills should be acquired before the beginning of the adolescent growth spurt (or peak, height and velocity) which is approximately 12 years of age for females and 14 years of age for males.

The success of sport systems in former communist countries of Eastern Europe, Malina (2009) believes, has contributed to a perceived need for early specialisation. The youthful age of competitors in several sports were highlighted by the media, which reinforced early specialisation as a requisite for success. Although Eastern European countries developed early specialisation in the 1970/80's, it has become a growing trend around the world. Many parents and coaches believe early specialisation is necessary to reach elite levels within a sport, and according to Finlay (2006) it is on the rise:

A growing number of coaches, parents, and children believe that the best way to produce superior young athletes is to have them play only one sport from an early age, and to play it virtually year-round’.

Many sports in the UK draw upon the Long Term Athlete Development Model (LTAD) framework (Balyi and Hamilton, 2004) featuring 4 stages for early specialisation (Training to train, Training to compete, Training to win and Retirement/Retainment). The stages concentrate on young people’s initial involvement in their chosen sport. Sports such as soccer, golf, swimming and skating focus on intensive training from a young age, which prioritise ‘practice over talent’, as argued by Vealey and Chase (2015) using the example of coaches at an elite Danish soccer academy, known for producing elite players, who admitted that when selecting athletes, they pick those slightly less talented, but have the mental ability to work extremely hard over exceptionally talented athletes who do not work as hard.

Balyi et al (2013) point to the success of Communist countries at international level, especially the Olympic Games, who demonstrate the advantages of early identification of talent, selection and specialisation, producing a remarkably high number of champions. Balyi et al (2013) also counteract the value of this system by alluding to the ultimate objective of these countries: to produce and prepare world-class athletes in the shortest time possible, regardless of consequences to an athlete’s health or development.

Many question the benefits of early specialisation in sport, such as Hill (2009), cited in Balyi et al (2013), who believes early specialisation contributes to a ‘one-dimensional self-concept as a result of a constrained set of life experiences’. Gould et al (1996) discuss the psychological burnout consistent specialisation can lead to, with an athlete’s busy schedule meaning limited time to socialise, possibly leading to symptoms such as depression, eating disorders and chronic fatigue. This theory is furthered by Bompa (2000), who compared the results of early specialisation with results from a multilateral sport programme, and found that because of an intense focus on one sport early in their lives, athlete’s peak in the mid-teens and by 18 many have dropped out.

When Bompa (2000) compared the effects of specialising in a single sport with the multilateral approach (Figure 1), he found that those who specialised were more focused on instant progress in their sport, meaning they may peak by their mid to late teens. Whereas those who played a number of sports had a more consistent development over a sustained period of time, allowing the athlete’s body and mind to mature appropriately, meaning their best performances were obtained at an older age.

EARLY SPECIALIZATION	MULTILATERAL PROGRAM
<ul style="list-style-type: none"> <li>• Performance improvements were immediate</li> </ul>	<ul style="list-style-type: none"> <li>• Performance improvements were continuous</li> </ul>
<ul style="list-style-type: none"> <li>• Best performances between 15-16 because of early adaptation</li> </ul>	<ul style="list-style-type: none"> <li>• Best performances over 18 due to physical and mental maturation</li> </ul>
<ul style="list-style-type: none"> <li>• Performance inconsistencies within competitions</li> </ul>	<ul style="list-style-type: none"> <li>• Performance consistencies within competitions</li> </ul>
<ul style="list-style-type: none"> <li>• By 18, many athletes quit or “burnout”</li> </ul>	<ul style="list-style-type: none"> <li>• After 18, many athletes were starting to “come into their own”</li> </ul>
<ul style="list-style-type: none"> <li>• Forced adaptation accounted for a high rate of injuries</li> </ul>	<ul style="list-style-type: none"> <li>• Gradual adaptation accounted for a low rate of injuries</li> </ul>

**Figure 1:** Bompa’s (2000) comparison between Early Specialisation and a Multilateral programme.

Evidently, there are proven benefits of early specialisation in sport, with sports stars such as Tiger Woods, Michelle Kwan and Cristiano Ronaldo having sustained periods at the top of their respective sports. The major detrimental effects focus on medical issues, revealed in Figure 1, which refer to added injury risks, possible dropout and the social or psychological effects of repeated constraints of a certain sport, as emphasised by Gould et al (1996) and Hill (2009). The impact of early specialisation depends on factors such as a child's ability, their gender and parental attitudes.

#### *Gender in Sport*

When discussing gender in sport, it is important to remember that research has shown there are clear physical differences in the genetic make-up of males and females, as argued by McKeag and Moeller (2007), who found that generally, a woman's strength is approximately 67% of a man's. According to Klein et al (2014), these differences become more prominent after puberty when boys develop their secondary sex characteristics, therefore affecting the rate of strength and body weight development in males. Due to these genetic variations, it may be unfair to expect males and females to compete at similar levels in certain sports.

A study by Gilenstam et al (2008), which investigated gender roles within female ice hockey players in Sweden, found that players professed to experiencing the stereotypes and stigma linked with 'masculine' sports. This 'stigma' may affect the type of sports both genders specialise in. In their study, Schmalz and Kerstetter (2006) found that taking part in sports perceived to be gender specific was evidently different between the two sexes. Gender neutral sports such as swimming, soccer and cycling had the highest participation rates for both genders and finally, that children as young as eight are aware of and affected by gender stereotypes in sport and physical activity, which may affect young females' motivation to participate or specialise in certain sports.

Although participation of females in sport is increasing, the difference in participation rates in sport between males and females is a major discussion point. Madden et al (2017) state that throughout history, women have participated in sports at much lower rates than men, pointing to CDC data from 2013 which found that 48.5% of high school girls played one or more sport in the previous year, compared to 59.6% of boys, indicating a significant difference.

#### *Early Specialisation and Gender in sport*

In terms of Early Specialisation in sport, males and females generally specialise in sports differently, due to the fact that they develop and grow at different rates. Due to these differences, they progress through the stages of development at different ages as shown in figure 2 by Gordon (2009), but this is not the case for all sports. Gymnastics is a sport associated with early specialisation, where, according to Hackford and Tenenbaum (2006), early specialisation is necessary for elite performers due to the precise requirements of the sport. A male gymnast's career may last longer than a female's as explained by renowned woman's gymnastics coach Mary Lee Tracy (1998), cited in Jutkiewicz (2012), who referred to the difference in physical development between genders, meaning that as boys enter puberty they tend to develop more muscle mass, beneficial in a sport which centres around strength and power, whereas girls experience more challenging physical changes for this sport during puberty, restricting continued top level participation in gymnastics.

Stage	Chronological and developmental age (years)
Sport for all	
Stage 1: Active start	Males and females 0-6
Stage 2: FUNdamentals	Males 6-9; Females 6-8
Stage 3: Learning to train	Males 9-12; Females 8-11
Excellence	
Stage 4: Training to train	Males 12-6; Females 11-15
Stage 5: Training to compete	Males 16-23; Females 15-21
Stage 6: Training to win	Males -19; Females -18

**Figure 2:** Stages of Long Term Development.

In figure 2, Gordon (2009) highlights the differing ages in which males and females enter the stages of long term athletic development. Both genders start at sport for all, developing through stages 1 and 2 at a similar rate. In the final stage of sport for all, females move into the ‘Learning to train’ phase before boys, meaning they continue onto the ‘excellence’ stages at a younger age. According to figure 2, by the age of 15, female athletes begin to train to compete and from 18 on, should focus on training to win, peaking around the age of 21. Whereas male athletes arrive at the same stage a year later, meaning that they reach the final stage of their long term athletic development when they are 19, and aim for peak performance around the age of 23.

Overman (2014) states that the disturbing rate of injuries in young female athletes is aggravated by early specialisation, intensive training and year round competition, and that research compiled suggests participating in a single activity for more than 15 hours a week significantly enhances the risk of serious injury, for both genders. The psychological impact of injuries on young athletes can be damaging, with Slobounov (2008) finding that even though adolescent athletes may be successful in dealing with physical trauma and heal quickly, their psychological response to injury may be highly maladaptive, leading to potential health issues.

In conclusion, it is obvious that there are a variety of viewpoints surrounding the potential benefits and drawbacks of early specialisation in sport, with relevant literature and research highlighting that early specialisation in sport affects both genders differently. Differences in growth development, type of sport specialised in, risk and impact of injuries and dropout rates should be taken into consideration. Young athletes, parents, and coaches/school teachers should be made aware of findings from current research on early specialisation and its effects, on both genders.

### **Methodology**

This section will explain the methodology applied in this research, focusing on early specialisation in sport and the impact of gender.

#### *Research Design*

The intention of this study is to examine the impact of gender on early specialisation in sport. The main focus of the study involved 4<sup>th</sup> and 5<sup>th</sup> year GCSE PE students, approximately 15-16 years old, completing a questionnaire, focusing on researching the number and gender of students who have specialised in a single sport. Within the questionnaire subjects were asked their gender along with a number of questions relevant to the sports they currently engage in as well as those in which they have participated in the past. The selection of this particular method is important, aiming to produce exact, independent and purposeful results for analysis and discussion, while being time efficient for the researcher and reaching multiple subjects simultaneously. Appropriate questioning is crucial within the questionnaire, to gain dependable and practical data, benefitting the investigation.

### *Subjects*

The study focused on participants in 4<sup>th</sup> and 5<sup>th</sup> year GCSE PE classes, approximately 15-16 years old, attending a range of post primary schools in Northern Ireland. Participants consist of 126 students, 44 females and 82 males from rural and urban areas. All schools are heavily involved in sport and emphasise modern and well-structured Physical Education programmes.

### *Procedures*

As the participation of schools and their students are critical to the study, prior to any testing taking place, it was vital that formal consent protocols were followed, by attaining permission from the principal and the student's parents. This is common procedure in schools authorising the participation of any pupil or in the divulging of information. To ensure the investigation taking place was ethically appropriate, an ethical considerations review form was completed prior to the commencement of data collection. To obtain the consent of the principal in carrying out the questionnaire, a letter was sent detailing the objectives and obligations of the study, assuring anonymity and professionalism throughout. The class teachers were notified of the study, as their contribution and assistance were necessary. Parents/guardians of the students also received a letter outlining in detail the purpose of the study, who was conducting the study and the requirements of the questionnaire their children would complete. Again, the anonymity and confidentiality of the study were emphasised. The bottom of the letter included a consent form, which once signed and returned, confirmed their child's involvement in answering the questionnaire. When all forms had been returned and principals had permitted their schools involvement, the testing commenced.

Prior to the completion of questionnaires, subjects were notified of what was required in each section of the questionnaire. Subjects were not informed of the exact rationale behind the study, ensuring they viewed it as an investigation rather than a competition, but were encouraged to be as honest as possible when answering.

When the data from the questionnaires were gathered, a suitable resource was applied to successfully analyse the data. A spread sheet was particularly helpful for recording the findings from the different sections of the questionnaire.

### *Test*

The test itself was the completion of a questionnaire. Subjects were asked to complete 10 questions regarding their gender, whether they currently participate in sport, what age they first began participating in sport or organised physical activity, what sports they currently participate in, how many hours per week they participate in these sports and the highest level they have reached within the sport. The second part of the questionnaire involved subjects revealing what age they started each sport they have participated in, sports they have previously participated in, reasons why they stopped participating in these sports and any current or previous physical activity their parents have been involved in.

### *Statistical Analysis*

All data and results collected from the subjects were produced on a spread sheet from Microsoft Excel. The data were thoroughly analysed and all the data collected generated into a number of different graphs. The Excel document was fully explored, to determine if any statistically significant issues arose. From these graphs, a range of percentages were calculated and are referred to throughout the Results and Discussion section of the study.

**Results and Discussion**

*Introduction*

The following section presents the results of the research carried out. The data collected will be used to present various graphs and charts. The results of the research will be discussed, attempting to interpret if gender impacts on early specialisation in sport.

*Subjects*

The subjects are pupils from three post primary schools in NI coming from a combination of rural and urban areas. The schools will remain anonymous to protect the anonymity of the subjects. The three ‘grammar’ schools have various characteristics but the most prominent being that one is an all-female school, one is a mixed-sex school and one is an all-male school. There are 126 subjects in total. They are in years 11 and 12 and approximately 15-16 years old. There are 44 females and 82 males in the study.

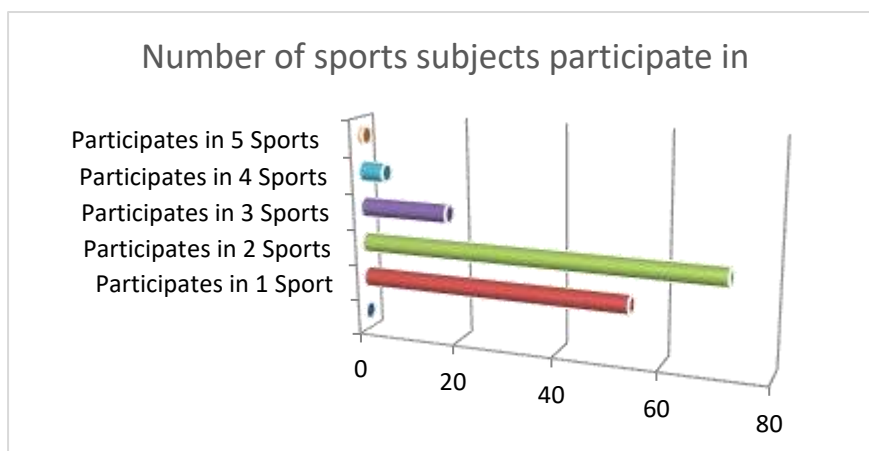
*Participation in Sport*

All 126 subjects were questioned on their current and previous involvement in sport and physical activity (Figure 3).

Participates in 1 Sport	36%
Participates in 2 Sports	48%
Participates in 3 Sports	12%
Participates in 4 Sports	3%
Participates in 5 Sports	1%

**Figure 3:** Number of Sports participated in by subjects.

This section illustrates the number of sports the 126 subjects currently participate in.



**Figure 4.** Number of sports participated in by subjects.



The graph highlights the number of subjects currently participating in either multiple sports (2 to 5) or a single sport. The results show that 64% of subjects still participate in 2 or more sports. When gauging these results, the impact of sampling has to be taken into consideration, but the results still correlate with Vealey et al's (2015) summary that sampling and diversification during the teenage years is generally the best strategy for developing talent in young athletes. From the graph, we learn that 36% of subjects participate in only one sport, meaning they are placing all their efforts on this sport. This is worrying according to Micheli's (2010) findings, which established that approximately 70% of children participating in just one sport in their early to mid-teenage years will more than likely stop playing by the time they reach their late teens.

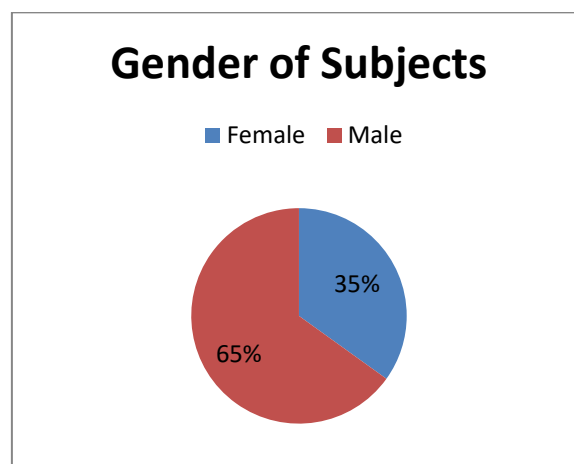
Figure 4 highlighted that 40% of subjects are competing at an elite level, and figure 5 shows us 36% of subjects participate in one sport only. These findings may be linked, as the majority of subjects participating at an elite level may make up a significant amount of the 36% that play one sport according to Ericsson (2014), who explains that if a child has reached an elite level within their sport between the ages of 15-18, research shows they are more likely to place increased focus on this sport, attempting to further develop their talents within this sport, having experienced action at an elite level.

Mackinnon (2003) believes that although children should participate in a variety of sports, the age of 12/13 for girls and 14/15 for boys is the optimum time to specialise in a sport, reinforcing the 36% of subject's decision to focus on a single sport.

An increasingly prominent reason behind 36% of subjects choosing to participate in one sport only may be time restraints. Byers et al (2012) claim that one of the main sports participation constraints for teenagers is increasing school and exam pressures, meaning they do not see any other choice but to focus on one sport as if they want to continue their studies in school, playing multiple sports may not be feasible.

### Gender

In total, there were 126 subjects that completed the questionnaire. The pie chart beneath illustrates that 35% of subjects were female, with 65% being male.

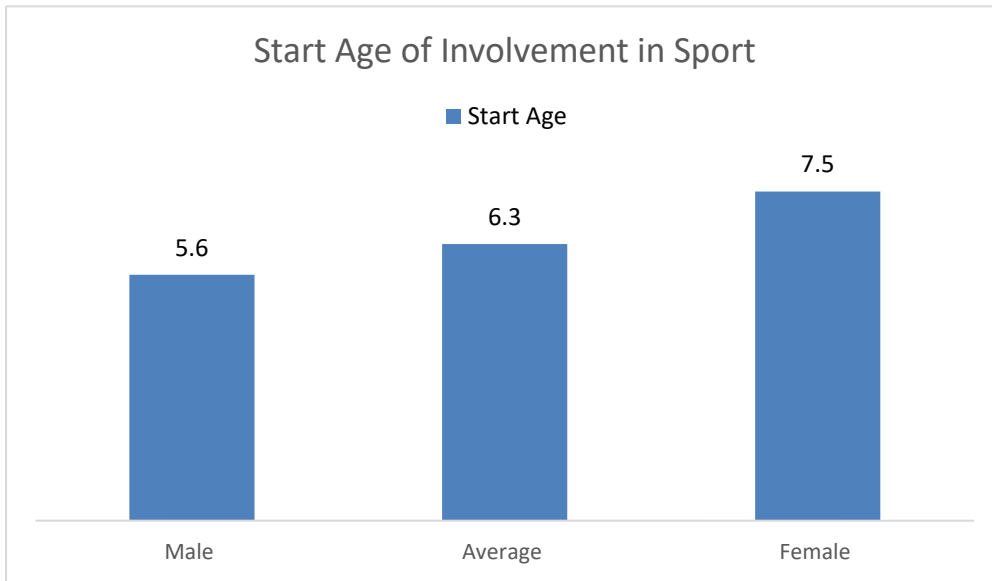


**Figure 5.** Gender of Subjects.

This demonstrates a slightly skewed study despite a very definite effort on the part of the researchers to equalise the number gender ratios by selecting the schools appropriately.

*Subject Start Age of Involvement in Sport.*

The chart below (figure 6) reveals the start age of the subject’s involvement in sport, divided into gender.



**Figure 6.** Start Age of Involvement in Sport.

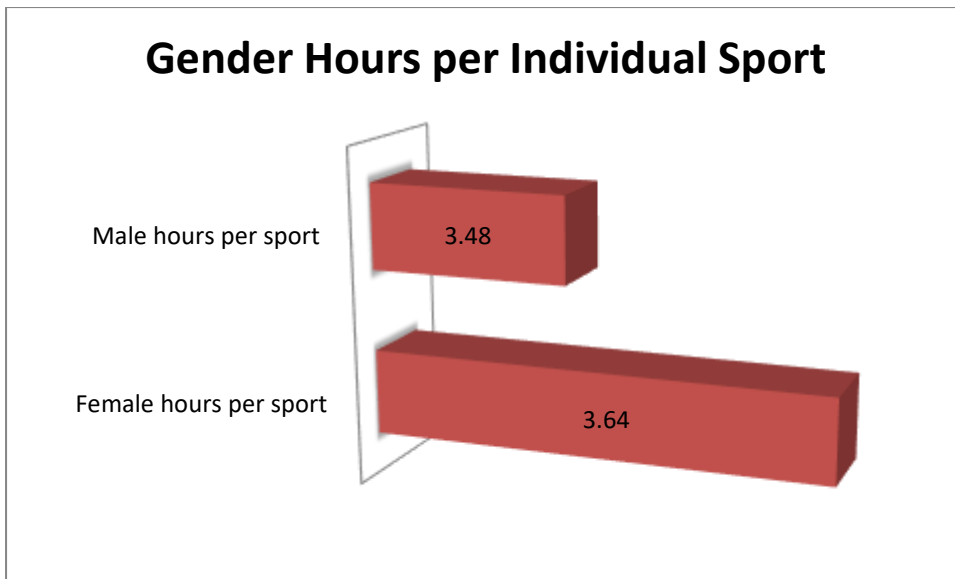
Results show males had a lower start age of 5.6 years, whilst females started around 7.5 years, with the average start age being 6.3 years. Results from figure 6 follow the norm in society that male subjects begin their involvement in sport at a younger age than females according to Feltz et al (2008), who articulated that males are socialised to be competitive and involved in sport from a very young age in comparison with females, who often have less experience with competition and sport at a younger age.

There is continued discussion between scholars about the best age to start sport for children, but Mackinnon (2005) argues that as long as a child is physically active from the age 5-7, within these years they may naturally assume a passion for sports through exercise, experiences and then begin their involvement with sports and competition.

The figures shown in the graph, that female subjects start their involvement in sport almost 2 years later than males, may be viewed as males getting a ‘head start’, but research by Jurimae and Hills (2001) found that in a representative sample of world ranking female gymnasts, the starting age was around 7.5 years, proving a slightly later start age may not inhibit young athletes’ chances of becoming elite.

*Amount of Hours Each Gender Spent on their Individual Sports*

This section highlights the amount of hours both male and female subjects spent participating within their individual sports, accounting for the different sports both male and female subjects take part in.



**Figure 7.** Gender hours per individual sport.

The results found that female subjects spend 3.64 hours per week participating in their individual sports e.g. camogie, Gaelic Football and Netball, compared to 3.48 hours for male subjects. (Figure 7) These results do not correlate with the norms of society, according to Clark and Paechter (2007) who argue that girls and women historically have been excluded from sport and physical activity due to perceptions of their inherent limitations and vulnerability. Although, this view is considered as out-dated by many, backed up by Sport England (2016) who found that more than 7.2 million females now participate in sport and regular physical activity in Britain, meaning the gender gap, once over two million in Britain, has narrowed to 1.55 million people. It should be remembered that results of the data collected represent a small percentage of teenagers, but underlines the increasing number of females becoming involved in sport.

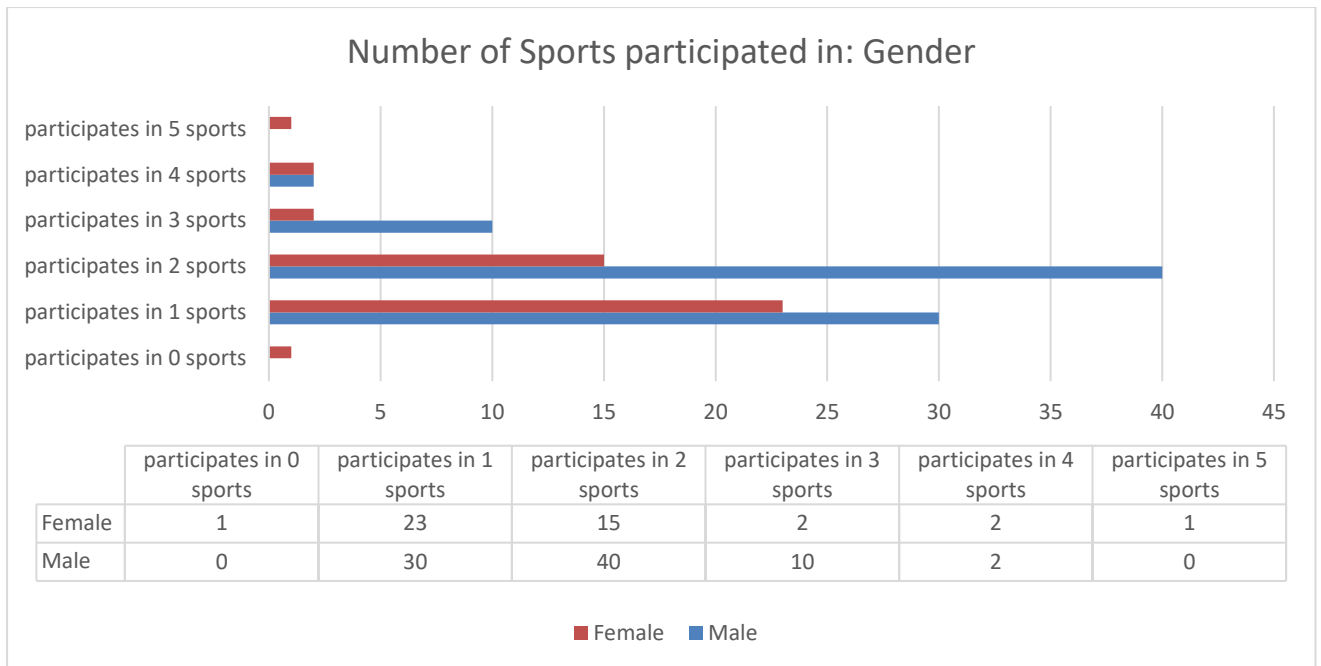
On average the subjects spent 3.56 hours participating in each individual sport, but research by Jayanthi et al (2012) found that athletes between the ages of 15-18 attempting to specialise should be spending at least 8 hours per week on that sport, meaning both genders in the study fall well below the recommended amount.

#### *Gender and Early Specialisation*

This section analyses how gender may impact upon early specialisation in sport among the subjects, looking at the type of sports played by both genders and how many sports male and female subjects currently participate in.

#### *Number of Sports Participated in by Subjects based on Gender*

This section compares the number of sports participated in by male and female subjects.



**Figure 8.** Comparison of the Number of Sports played by Male and Female subjects.

Figure 8 reveals that 86% of both male and female subjects participate in one or two sports. These results concur with Malina’s (2009) findings, who concluded that those selected onto elite programmes will participate much less in sports than those who don’t. Results from Figure 1 showed 40% of subjects are already participating at an elite level in sport, which may explain why a high percentage of subjects from both genders have either chosen to play one sport only, or have narrowed down to two sports at the age of 15 or 16. Although the findings from figure 8 do agree with Mackinnon (2003) who asserted that the age of 12/13 for girls and 14/15 for boys is the optimum time to specialise in a sport, possibly clarifying why many subjects are beginning to focus on one or two sports.

In terms of gender and early specialisation in sports, results may be skewed by the fact that not many subjects participate in typical early specialisation sports, and if they have, not at an elite level. Armstrong and McManus (2011) believe that if a young athlete has not played a sport at an elite level by the age of 17, they more than likely will not reach an elite level within the sport. Although it may be argued that because 37% of males and 52% of female subjects participate in one sport only, these subjects have already specialised in their sport. Mackinnon’s (2003) argument that males have an extra few years to develop as an athlete before specialising, may explain why a higher percentage of male subjects are still playing more than one sport.

**Conclusion**

After analysing and discussing the results from the questionnaires attained from the study, it appears that gender can impact on some elements of early specialisation in sport. As 52% of females in the study participate in one sport only, and only 38% of males do likewise, it is evident that the findings of Gordon (2009) and gymnastics coach Mary Lee Tracy (1998), as cited in Jutkiewicz (2012) are true. Gordon (2009) proposes that females generally specialise in sport earlier as they progress through stages of development at a quicker rate than male athletes, (Figure 2), therefore training to peak earlier in their sport. Tracy (1998) claims this must be expected, who, cited in Jutkiewicz (2012), recognises the difference in the rate of physical development between genders. As males enter puberty, changes they go through enable them to become faster, stronger and more powerful, whereas females reach physical maturity earlier in terms of sport during puberty, explaining why they push to specialise and peak in sport earlier than their male counterparts.

Findings from the study also proved the accuracy of research completed by Schmalz and Kerstetter (2006) who argue that 'gender neutral sports' boast the highest participation rates for both males and females, as Gaelic Football, Hurling/Camogie, and Soccer were the highest. Whilst some elements of early specialisation in sport are impacted by gender, these elements may only be applicable to this particular study, and not in wider research of the two variables.

### Recommendations

- To improve the accuracy of results, the number of subjects included would need to increase, along with the scale on which the study is carried out.
- Subjects may answer the questionnaire at a more appropriate time of the sporting year, as over the winter months, many sports or clubs are not active, gaining more accurate results.
- Having an equivalent number of male and female subjects in the study would increase the validity of the results.

### Limitations

- A clear limitation of the study was the sample size of 126. To acquire more accurate and valid results, it would be essential that the sample size be enlarged.
- The inconsistent male to female ratio within the investigation limited the study, as of the 126 subjects, 44 were female (35%) and 82 were male (65%), making it difficult to determine truthful results and doubts may arise over the validity of the results.
- The time of year the study took place as many subjects may not be as active as they are in spring or summer months, restricting the dependability of results.
- The scale on which the study took part limited findings, as the areas in which the subjects came from participate more in team sports associated with their area, not necessarily associated with early specialisation.

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