

## Early specialization and recommendations for swimming

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<p><b>Abstract</b></p> <p>The present work was done to investigate the literature to see what does the literature say about specialization in swimming, to get perspective and learn from other sports and to make a material for Finnish Swimming Association (Suomen Uimaliitto). Based on the literature, the purpose was to make an educational material for the Finland's Swimming Association which they can use for coaches education, athlete development and long-term development how they see fit.</p> <p>The project started in the beginning of 2018 with a literature review about early specialization in sports and was which was the initial work. After that it got re-evaluated, the new work got defined more specifically to swimming and Finnish Swimming Association was included in to the process. For the information collection were used different type of studies, reviews of studies and literature and articles. Information was collected from Google Scholar, Pubmed and other relevant internet databases for the matter.</p> <p>Based on the literature, the end result was a material going through the findings in this work and recommendations. After discussions with the swimming association, we decided that the material is a "raw material" which they can freely use to coach education, athlete development, long-term development or how they see fit. The material ended up being 11 pages summarizing the findings and recommendations of this work.</p> <p>Google Scholar, Pubmed and other internet databases were searched that discusses early specialization, injuries, burn outs, drop outs, recommendations for swimming, youth sports and related articles. This study focused mainly in literature from this century, but some earlier case studies and relevant articles were included.</p> <p>Results of the study shows that early specialization can be harmful for youths physical health, mental health, reduces the length of careers, but it is still useful in some cases and an effective way to attain expertise. The research shows that having a diverse sporting background will lead to higher level of expertise and athletes who have multisport background are more likely to achieve elite status while avoiding the possible negative outcomes of early specialization.</p>	
<p><b>Key words</b> Early specialization, swimming, sampling, physical development, mental development, recommendations.</p>	

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# 1 Introduction

Participating in sports or other physical activity is recommended for children and youth due to the physical and mental health benefits in short-term and long-term. In addition to learning sport specific skills, sports can also teach various essential life skills and has a positive effect on health later in life. (Baron 2007, Weiss 2004, Van Langendonck & al 2003 in Kaleth & Mikesky 2010, 1.)

Sport specialization means that athlete is participating in intense training only in one sport while excluding other sports. Starting to specialize before puberty or in the beginning of puberty is getting increasingly common. Some level of sport specialization is needed to attain elite level in sports, but the timing of specialization is a common subject of debate. The biggest concern is that starting intense training in early childhood may be detrimental to the athlete. The potential risks included in early specialization are higher rate of injuries and overtraining, potential complications in growth and maturation especially with females, burnouts, dropouts, social isolation and health issues later in life. There's no evidence that intensive training and exclusion of other sports is necessary to attain elite level in late specialization sports. (Jayanthi, Pinkham, Dugas, Patrick & LaBella 2012, 251-255.)

The trend in youth sport participation has developed from recreational free play to highly structured sport specific training with emphasis to develop skills required to succeed in sports (Malina 2010, 365; Vaeyens & al 2009, in Jayanthi & al 2012, 251). Jayanthi & al (2012, 251), suggest that "This evolution in youth sports may have developed as a result of society's increasing regard for successful athletes, who enjoy significant recognition and financial rewards for their achievements".

Ericsson et al "proposed 3 stages in becoming a specialist or expert musician: 1. start at an early age, 2. specialize and increase participation and 3. dedicate full-time commitment" (Ericsson & al 1993 in Jayanthi & al 2012, 252). This definitions doesn't take into account athletes who participate in one sport year round training in high volumes, but still competes in other sports and those athletes who participate in only one sport with changing participation during the year (Jayanthi & al 2012, 252).

It's hard to say what would be best way to define specialization, but probably it would be participating in one sport more than 8 months in a year, practicing more hours in a week than the athletes age's in organized sports and more than 16 hours a week in intense physical activity. The common guidelines for the amount of training young athletes should do is maximum 8 months of training a year in one sport, practicing maximum the same

amount of hours a week that the athletes age is in organized sports and maximum of 16 hours in a week of physical activity. Which is recommended by modern long-term development models (Côté & al 2009, Lloyd & Oliver 2012 in Blagrove & al 2017, 1).

The goal of this work was to get a clear understanding of early specialization in youth sports and swimming. To get a clear understanding a look in the past and present were done to find out how has early specialization started, what are the impact of it for athlete's wellbeing and long-term development, does it predict elite-level success, what alternatives there are and make recommendations based on the literature view. Material based on this literature was made for Finland's Swimming Association which they can use in educational purposes or how they see fit.

## 2 Literature review

Some of the key concepts the reader of this work should know are early specialization sports, late specialization sports, deliberate practise, deliberate play, Sampling, diversification, multisport background and athlete pathway which are explained in more detail below to get better understanding of the work.

“Sports specialization is defined as intense, year-round training in a single sport with the exclusion of other sports”. However, there is variations of this theme. There is disagreement on what volume of training is intense and does the athlete have to exclude all other sports to be classified as specialized. Some suggest that there’s a minimum amount of training that has to be done to be specialized and others think that specialization means participating in one sport year round regardless of training volume. (Hill & Simons 1989 in Jayanthi & al 2012, 252.)

Early specialization sports are “mostly acrobatic and artistic sports such as diving, figure skating, and gymnastics are defined as sports in which early sport-specific training (by ages 5 to 7) is necessary for future excellence. In these sports, complex movement and sport skills should be acquired before the onset of the adolescent growth spurt (or peak height velocity, or PHV), which is approximately 12 years of age for females and 14 years of age for males” (Balyi, Way & Higgs 2013). Common between early specialization sports is also the very young age when athletes peak. This might happen as early as in the beginning of puberty.

The opposite of early specialization sports are late specialization sports. Late specialization sports are all other sports “including team sports, racket sports, combative sports, and gliding sports” (Balyi & al 2013, s.a.). In late specialization sports the athlete’s peak performance comes after maturation so the complex and sport specific skills don’t have to be at expert level before growth spurt. Swimming is categorized as a late specialization sport.

Deliberate practice, which is defined as: “Effortful practice that lacks inherent enjoyment done with the sole purpose of improving current levels of performance” (Starks & Ericsson 2003 in Malina 2010, 366), can be associated with specialization due to its main emphasis on improving performance. The older the athletes get, the more deliberate practice should be done. If the goal is to reach elite level, high amounts of deliberate practice has to be done, but when and how much during different phases of athlete’s career is a common topic of debate.

Deliberate play on the other hand is the opposite of deliberate play and it's defined as: "training that has age appropriate rules which are set by children and supervised by children or an adult" (Côté, Lidor & Hackfort 2009, 9). Games like street hockey, street basketball or tag in swimming pool are considered as deliberate play. Deliberate play is more free play-like and unstructured than deliberate practice.

When athletes is participating or has participated in multiple sport until mid- or late puberty it's referred to as sampling, diversification or having a multisport background. When athletes specialize early they don't participate in multiple sport, but focus solely on one sport from an young age.

Athlete pathway is defined as a pathway that "spans the entire continuum of athletic development, from initiation of fundamental movement and participation in physical activity through to lifelong engagement and proficiency at a senior, elite, and/or international level" (Cameron & Porter 2017, s.a.).

## **2.1 Roots of early specialization**

To get a better picture of the issue we first have to take a look at where and when has early specialization has started and what are the things which influence us to choose early specialization.

### **2.1.1 Eastern Europe**

The relative success of the former communist countries of Eastern-Europe in sports especially in former German Democratic Republic and Soviet Union (Malina 1994, 389) has been seen as a contributing factor to a perceived need for early specialization. In the west, it's commonly seen that systematic training in Eastern-Europe started at early ages and involved year-round participation. The quite young age of the athletes in several sports were highlighted in the media and reinforced the early specialization being need for success. Eastern European talent identification and development programs varied to some extent by sport and emphasized participation to a variety of activities and skills in early sport experiences (multilateral training). Specialization in most sports started after or late puberty, but there was some exceptions like gymnastics, diving, figure skating and somewhat also swimming. In these sports, specialization started much earlier. (Bompa 1995, Bompa 1985, Drapik 1996, Hartley 1988 in Malina, 2010; 364.) It's believed that early specialization was reinforced by sport experts from Eastern-Europe who moved to western countries and started working with elite athletes (Malina 2010, 364).

### **2.1.2 Role of parents**

Parents play a big role when it comes to specializing in sports and other hobbies or activities in young people's life. "In the study *Developing Talent in Young People* (Bloom 1985 in Malina 2010; 365) talented individuals in sport (tennis, swimming), art (pianists, sculptors), and science (research neurologists, mathematicians), fields in which success (elite status) was attained at relatively young ages were studied" People (Bloom 1985 in Malina 2010; 365). The home environments of these talented individuals had three common characteristics:

- The parents pushed their own interest into the activities of their children and they were really involved in the children's hobbies
- The parents concentrated in development in that hobby the child was participating in
- The parents valued and emphasized achievement (Sloane 1985 in Malina 2010, 365.)

So the parents in this study were really results-oriented and involved in their children's hobbies. This kind of behavior has at least been influenced by stories like Tiger Woods who was introduced to Golf at the age of two and Williams sisters who have a similar background with a lot of deliberate performance-oriented practice, a very involved parent and highly-regulated life since childhood which has led to high success (Malina 2010, 365). Although parents are often the driving influence on the initiation of sports, multiple studies suggest that the coach is the primary driving influence on the decision to specialize in a single sport (Feeley, Agel & LaPrade 2015, 2).

Showing interest in your children's hobbies and pushing them to achieve things is a good thing, but in children's sports the emphasis should be on the enjoyment of sport. There's of course other people who affects children's specialization like coaches, friends and other people close to or meaningful to them.

### **2.1.3 Labeling**

"Children often are labeled as gifted or talented at an early age in sport, arts and academics. Such labeling probably encourages specialization" (Malina 2010, 365). We all have probably seen some videos, heard about or seen a really young child who seems to be extremely talented in his sport or playing an instrument or whatever the activity is. These children are often called (labeled) as the next superstar like the next Michael Phelps etc. This labeling can have an effect on specialization, but to what extent is still unclear.

#### **2.1.4 Economic benefits**

Some parents and children may be affected by the possible financial benefits of sports. The mentality they have is that if you start earlier than others, they will get an edge over others by accumulating more training hours and the possibility to get scholarships, even though this is a bit unrealistic because only 2.2% of girls and 2% of boys who participate in sports in high school will get a full or partial scholarship (Pennington 2008 in Malina 2010, 365), sponsor deals or professional contract which is again unrealistic since only small part of children who participate in sports will ever become a professional athlete. It has been suggested that the sporting goods industry has affected early specialization due to increased demand for sport products and advertisement aimed for parents and young people. (Malina 2010, 366.)

#### **2.1.5 10 000 hour rule**

There's plenty of evidence that 10 000 hour of deliberate practice and/or 10 years of experience is needed to achieve level of expertise and international success in multiple disciplines such as music, chess and sports. (Malina 2010, 366; Ericsson 1993, Sosniak 1985, Gustin 1985, Kalinowski 1985, Wallingford 1975 in Baker 2003, 86.)

However, there's also plenty of evidence proving that 10 000 hour of deliberate practice and focusing in single sport isn't needed to achieve international level in sports. It has been studied and suggested that elite level in sports can be achieved with only 3000-6000 hours of practice (Côté & al 2009, 10; Moesch, Elbe, Hauge, & Wikman 2011, 6).

Now that 10 000 hours of deliberate practice in 10 years comes down to close to 3 hours (~2.7 hours) of practice a day every day during the 10 year period of time. That is a lot of practice which isn't necessarily enjoyable (deliberate practice) to achieve especially for young people.

This kind of time commitment will exclude children from other activities and to achieve these training amounts, parents might see essential for their children to start specializing early in single sport (Malina 2010, 366).

## **2.2 Physical impact**

There can also be physiological consequences to early specialization. Most commonly discussed in literature are injuries, overtraining, limited motor skills and concerns about the effect of excessive training on children's growth and maturation, especially with females.

### **2.2.1 Motor skills and coordination**

One of the most discussed benefits supporting specialization is learning skills for the specific sport the children are participating in and it's probably true. Athletes who practice more frequently and more hours, are more proficient than the athletes who practice less. Some adults believe that if children isn't involved in organized sports by the age of 7, they will be behind in their skill development. However, it has been speculated that limited range of skills practiced during early specialization will harm overall skill development, which may affect involvement in physical activity and health in long-term by decreasing the likelihood of participating in other physical activities. (Wiersma 2000, 14-16).

When studying about the differences in physical and gross motor coordination in boys aged 6-12 years specializing in one versus sampling more than one sport they found that children who participate in more than one sport showed better test results in strength, flexibility, speed and agility, cardiovascular endurance and in gross motor coordination. (Fransen & al 2012, 381.)

Lidor, Côté & Hackfort (2009, 139), found that tests on same physical qualities worked as a predictor for future success in team and individual sports. While some researchers note that critical periods may exist when a sport is learned, but "Scientific evidence does not support the belief that specific skills must be learned and perfected before the onset of puberty" (Hecimovich 2004, 35).

### **2.2.2 Growth and maturation**

Complications in growth and maturation have been occasionally said to be as a possible result from early specialization. Especially who has a short stature and later maturation are examples of these complications. (Malina 1994, 409-414.)

When studying the effects of training to growth and maturations, gymnastics seems to be the sport that is most affected by training at young age. In a two year comparison period of adolescent gymnasts and swimmers, results showed that gymnasts had much lower growth velocity and their predicted height dropped over time (Theintz & al in Goodway & Robinson 2015, 274). Swimming didn't have any negative impact on the swimmers. Same findings were made by Malina (1994, 401-409), and Baxter-Jones, Helms, Maffulli, Baines-Preece & Preece (1995, 390). Malina's research showed that swimmers were above median in height and weight and the latter study found out that male swimmers matured earlier and male gymnasts matured later than average.

There's some findings that indicate that girls who do sports get their menarche later than girls who don't do sports. This brings up concern that intensive training might affect girls sexual maturation. There's hypothesis that poor nutrition, training stress and low levels of body fat is responsible for this delay. Some gymnasts might feel the pressure to have certain kind of appearance and this can lead to eating disorders. (Hecimovich 2004, 35-36.)

All though this is a risk in other sports as well and not only because the pressure felt from having certain kind appearance in sports, but because of societal pressure.

The research of this subject is still limited, but there's some research showing that physical training can affect the growth and maturation of physically active children. Most of the evidence however, shows that sport participation doesn't affect growth and maturation (Malina 1994, 392-419; Kaleth & Mikesky 2010, 30).

Based on the research made for this work, it seems that gymnasts seems to be to most affected by training on their growth and maturation. Since gymnastics is an early specialization sport, we can hypothesize that the cause is the intensive training gymnasts go under at very young age. Swimmers on the other hand seems to be safe from this.

There is concerns that physical training may cause cardiac problems, but it's based on limited data and there's no indication that athletic training will cause heart injury (Hecimovich 2004, 36).

### **2.2.3 Injuries and overtraining**

As the participation in youth organized sports keep increasing, so does injuries. More and more children are participating in organized sports year-round and sometimes in multiple sports simultaneously, is the reason for increasing amount in overuse injuries. Overuse is the most common factor that leads to injuries in young athletes (Brenner 2007, 1243).

"Overuse injuries can be classified into 4 stages: (1) pain in the affected area after physical activity; (2) pain during the activity, without restricting performance; (3) pain during the activity that restricts performance; and (4) chronic, unremitting pain even at rest" (Brenner, 2007, 1243).

Same findings were made by (Post & al 2017, 1408) in their study; the association of sport specialization and training volume with injury history in youth athletes they reported (Table 1), that "highly specialized athletes were more likely to report a previous injury of any kind

or an overuse injury in the previous year compared to athletes in the low specialization group”.

Table 1. Weekly sport participation volume and injury history (Post & al, 2017, 1410)

Odds Ratios for Specialization Category, Volume Recommendations, and History of Various Injury Types<sup>a</sup>

	History of Any Injury	History of Overuse Injuries	History of Upper Extremity Overuse Injuries	History of Lower Extremity Overuse Injuries	History of Concussions
Specialization					
Low	—	—	—	—	—
Moderate	1.32 (1.05-1.67) <sup>b</sup>	1.39 (1.02-1.90) <sup>b</sup>	1.46 (0.85-2.61)	1.39 (0.99-1.98)	0.81 (0.52-1.27)
High	1.59 (1.26-2.02) <sup>c</sup>	1.45 (1.07-1.99) <sup>b</sup>	1.91 (1.14-3.35) <sup>b</sup>	1.37 (0.98-1.95)	1.27 (0.85-1.94)
Volume recommendations					
Playing >8 mo					
No	—	—	—	—	—
Yes	1.85 (1.50-2.27) <sup>c</sup>	1.60 (1.21-2.14) <sup>d</sup>	1.68 (1.06-2.80) <sup>b</sup>	1.66 (1.22-2.30) <sup>d</sup>	1.61 (1.08-2.47) <sup>b</sup>
Organized sports >16 h/wk					
No	—	—	—	—	—
Yes	1.36 (1.13-1.64) <sup>d</sup>	1.38 (1.09-1.74) <sup>d</sup>	1.43 (0.98-2.09)	1.44 (1.12-1.86) <sup>d</sup>	1.21 (0.87-1.68)
More hours per week of organized sports than age					
No	—	—	—	—	—
Yes	1.34 (1.12-1.61) <sup>d</sup>	1.26 (1.01-1.59) <sup>b</sup>	1.41 (0.97-2.08)	1.30 (1.00-1.67)	1.29 (0.93-1.79)
Organized sport:free play ratio >2:1					
No	—	—	—	—	—
Yes	1.00 (0.83-1.20)	0.94 (0.74-1.18)	0.83 (0.57-1.21)	0.99 (0.77-1.28)	1.06 (0.76-1.48)

<sup>a</sup>Values are reported as odds ratio (95% CI). Models for specialization were adjusted for age, sex, and hours per week in organized sports, while models for volume recommendations were adjusted for age and sex. For specialization, “low” serves as the reference category. For each of the volume recommendations, “no” serves as the reference category.

Hecimovich (2004, 35) mentioned in his article that excessive sports training in child and adult athletes can lead to overuse injuries such as:

- tendinopathy or tendinosis
- apophysitis
- stress fractures
- Growing athletes may be predisposed to "repetitive stress injuries, such as traction apophysitis (Osgood-Schlatter disease),
- Sever disease,
- injuries to developing joint surfaces (osteochondritis diseases),
- and/or injuries to the immature spine (spondylolysis, spondylolisthesis, vertebral apophysitis)

Many young athletes experience physiological stress caused by repetitive cycles when training for example swimmer’s shoulder, tennis player’s elbow and runner’s stress fractures so it’s important that these young athletes don’t specialize until they are physically ready to withstand that physical stress (Hecimovich 2004, 35). A few athletes develop overtraining syndrome and may leave sports completely (Hecimovich 2004, 36).

There’s limited amount of studies focused on injuries in adolescent swimmers, however there’s several studies made with a wider age range. One of them (Feeley & al, 2015, 6) studied 80 elite swimmers between 13 and 25 years old and found that “91% of the swimmers reported shoulder pain, 84% had positive impingement signs, and 70% had MRI evidence of supraspinatus tendinopathy.” In this study the stroke preference did not correlate with injuries, but the number of hours in a week and the weekly distance swam correlated with supraspinatus tendinopathy and pain. Walker & al (Feeley & al, 2015, 6)

reported after evaluating swimmers from 11 to 27 years of age that those swimmers with both increased and decreased external rotation were in a much higher risk of a shoulder injury. “Multiple studies suggest that a previous shoulder injury is the most important risk factor for developing further shoulder injuries” (Harrington, Meisel, Tate, 2014. Hibberd, Myers, 2013 and Walker & Colleagues in Feeley & Al, 2015, 6).

“Overtraining is a multifaceted diagnosis that has been found to affect 37% of elite swimmers between the ages of 16-20” (Kentta, Hassmen & Raglin, 2001 In Smith, 2018). Swimmers engage in both strength and endurance training in bouts of high volumes and intensities which makes them vulnerable to being overtrained. That diagnosis is given to the swimmers who show decreased performance in competition due to lack of recovery prior to competition (Flynn & al, 1994, Hooper & al, 1993, Hooper & al, 1995, Morgan & al, 2013, O’Connor & al, 1989, Li & al, 2012 In Smith, 2018). “Overtraining includes physiological and psychological factors that work synergistically to hinder the performance of elite swimmers” (Kentta, Hassmen & Raglin, 2001, Slivka, 2010 In Smith, 2018).

Figure 1. Most common overtraining symptoms (Caruso s.a.)

SYMPTOMS DURING TRAINING	PHYSICAL SYMPTOMS	NONPHYSICAL SYMPTOMS
Normal workouts feel more difficult	Persistent fatigue	Difficulty sleeping
Early fatigue during workouts	Ongoing muscle soreness	Feelings of irritation or anger
Faster heart rate with less effort	Loss of appetite	Feelings of depression
Decreased strength	Increased aches and pains	Lack of motivation
Decreased coordination	Increase in overuse injuries	Fear of competition
Physical challenges seem too hard	Frequent colds or infections	Difficulty concentrating
Decreased performance on strength, speed, or endurance testing	Lower resistance to common illnesses	Increased sensitivity to emotional stress

### 2.3 Mental impact

Since only a fraction of the kids ever become professional athletes, we should be more concerned about the potential costs of the pursuit of success and we should do our part in trying to raise independent well functioning individuals through what sports can teach. These skills will last long after their athletic careers and that’s why we should be more focused on the psychological benefits of sports outside of competing and succeeding. Studies have reported that adolescents who participate in multiple extracurricular activities (e.g. sports, volunteer, arts) shows better success in school and has more positive peer relationships than those who participate in less extracurricular activities. (Fredricks &

Eccles, 2006 in Côté, Horton, Wilkes & MacDonald 2009, 9.) This is believed to cause by the distinct social experiences and the behaviors and/or skills the different activities in its own way teach the youth (Fredricks & Eccles 2006, Rose-Krasnor & al 2006 in Coté & al 2009, 9). Intensive participation in only one activity or sport can take away time from normal social and developmental activities. This may cause isolation and other negative consequences like depression, conversion reactions, anxiety and eating disorders (Cahill & Pearl, 1993, Smoll & Smith, 1996, Murphy, 1999, Stryer & al, 1998, Yeager & al, 1993, Patel & al, 1998 in Hecimovich, 2004, 36).

### **2.3.1 Life skills**

“Children who sample different activities have a greater chance of developing life skills such as time management, communication skills and leadership skills”. Yoo (2001 in Coté & al 2009, 9) Reported that athletes in individual and team sports showed different kind of “sport-related coping strategies” learned in different kind of environments specific to that sport. “This suggests that a child would develop more life skills by participating in multiple activities compared to specializing in just one activity” (Coté & al 2009, 9).

### **2.3.2 Prosocial behavior (concern for the rights, feelings and welfare of other people)**

The participation in multiple activities promotes prosocial behavior more than being involved intensively in only one activity (Fredricks & Eccles, 2006 in Coté & al 2009, 9). This is speculated to happen due to the exposure to multiple prosocial norms in different activities instead of just one. Children who participate in multiple activities also shows resilience to negative social norms that may exist in one sport (Coté & al 2009, 9).

### **2.3.3 Identity**

Research show that exploring multiple roles and identities within multiple social norms (e.g. athlete, musician) will help youth achieve identity that's true to themselves (Waterman 1984, Harter 1990 in Coté & al 2009, 10). “In contrast, early specialization may promote the state of identity “foreclosure” which occurs when a child's identity is prescribed to them by parents without sufficient exploration” (Harter 1990 in Coté al 2009, 10). Those children who're heavily involved in only one activity for a long period of time has limited life experiences, might develop a unidimensional self-image and power relationships in and around sports which may restrict young persons control over their lives. “Athletes on a team establish a social subculture of similar values, beliefs and

attitudes. Team members identify with these behaviors and expectations and base their self-concepts on the degree to which other members of the group accept them” (Hecimovich 2004, 37).

#### **2.3.4 Diverse peer groups**

“As children enter adolescence, peer acceptance becomes an important aspect of a positive self-concept (Brown 1990 in Coté & al 2009, 10). Youth describe satisfying different needs (e.g. social needs) by having multiple peer networks (Patrick & al 1999 in Coté & al 2009, 10) which can be enhanced through sampling”. Early specialization on the other hand, limits children to only peer group (Coté & al 2009, 10).

#### **2.3.5 Social capital**

“Social capital includes the relationships between youth, their parents, other adults and the community” (Smylie & al 2006 in Coté & al 2009, 10). Children who participate in multiple sports instead, will garner more social capital because they get to interact and create relationships with wider range of adults and peers than those who participate in only one sport or activity (Coté & al, 2009, 10). Youth who participate in sports shows that they have more self-reported interaction with their parents (Broh 2002 in Coté & al 2009, 10) and more interaction with other adults (e.g. coaches, teachers) (Eccles & al 2003 in Coté & al 2009, 10). “On a single sport and the associated time commitment may foster isolation from age and sex peers, especially during adolescence and may alter relationships with peers, parents and family” (Malina 2010, 367-368).

“Sport is an excellent means of developing social skills such as cooperation and socially acceptable behavior; however, spending too much time training may not provide enough time for social growth and can lead to “social isolation”” (Wiersma 2000 in Baker 2003, 88).

#### **2.3.6 Dropouts**

Probably the most damaging evidence against early specialization is children’s dropouts from sports or sport. Research about this matter constantly brings up that lack of enjoyment and fun is dominant reason why children dropout of sports (Ewing & Seefeldt 1996, Gould 1987, Weiss & Petlichkoff 1989 in Baker 2003, 88). In a 10 year retrospective investigation about drop outs in youth from competitive sport (Butcher & al 2002 in Baker 2003, 88) found that in the early phases of the children’s sporting career lack of enjoyment

was the most important reason for youth to change to a different sport than what they participating in or dropout of sports completely. As outlined by Ericsson, deliberate practice isn't inherently enjoyable. The type of training that comes with early specialization can be harmful for the long-term enjoyment and involvement (Baker 2003, 88).

Consistent with prior youth and elite sport findings (Scanland, Carpenter, Lobel & Simons 1993, 282) the results of this study showed that the perceived effort and mastery factor was a positive and significant predictor of sport enjoyment. "This and the related findings from the literature, make an important statement" (Scanland & al 1993, 282). Salguero, Gonzales-Boto, Tuero & Marques (2003, 531-532) studied 62 swimming dropouts and surveyed their reasons for quitting. "Having other things to do" was the most important reason for attrition. Followed by "my skills did not improve", "the training was too hard", "did not like coach", "not enough fun" and "it was boring". Less rated items were "parents or close friends no longer wanted me to swim", "did not like the awards" and "did not feel important enough" .

"Females placed greater emphasis than males on excessive pressure, hard training, dislike of competition, not winning enough and not feeling important enough" (Salguero & al 2003, 533).

In a systematic review Determinants and Reasons for Dropout in Swimming (Monteiro, Cid, Marinho, Moutão, Vitorino & Bento 2017, 10), the results clarify that "regardless of the design type of each study, it appears to be unanimous that the main reasons leading to dropout in swimming are controllable by the athletes (e.g., 'conflicts with coaches', 'having other things to do', 'failure in competence improvement', 'pressure by the parents, peers or coaches', 'lack of fun', 'boredom')".

### **2.3.7 Burnouts**

The overtraining syndrome can be defined as a "series of psychological, physiologic, and hormonal changes that result in decreased sports performance" (Small 2002 in Brenner 2007, 1243). The young athlete might have feelings of fatigue, lack of motivation for practicing or competing or difficulty completing familiar tasks (feeling overwhelmed). Other signs of chronic stress include agitation, sleep disturbances, depression, lack of energy, skin rashes, nausea and frequent illness (Gould & Dieffenbach 2003, Weinberg 1995 in Malina 2010, 368). "Burnout should be recognized as a serious sequel of overtraining syndrome".

Burnout does not happen suddenly, but it develops over a long period of time. Athlete perception of the situation is that she's thinks she isn't able to handle the physical or psychological demands placed for her either by coaches, parent, peer or herself.

Contributing factors include injury (often a trigger), overprotection by coaches, trainers, parents and sport officials and perceptions of not being able to meet self-imposed expectations or those of others, reduction in sport accomplishments and associated rewards (Gould & Dieffenbach 2003 in Malina 2010, 368). As stated before there's multiple factors involved, there's three primary: "negative performance evaluations, critical rather than supportive inconsistent feedback from coaches and officials and overtraining" (Malina 2010, 368).

"Prevention of burnout should be addressed by encouraging the athlete to become well rounded and well versed in a variety of activities rather than 1 particular sport" (Brenner 2007, 1243).

## **2.4 Benefits of early specialization**

There's plenty of evidence proving that early specialization work. In a review (Ericsson 1993 in Baker 2003, 86) over multiple decades about the effect of practice on learning, speculated that "early specialization in what they termed "deliberate practice" (i.e. effortful practice that lacks inherent enjoyment done with the sole purpose of improving current levels of performance) was essential to the development of expertise in any domain".

"The 10 year or 10 000 hour rule stipulates that a 10-year or 10 000 hours commitment to high levels of training is the minimum requirement to reach the expert level. This rule has been applied successfully in many domains including music, mathematics, swimming, distance running, and tennis (Ericsson 1993, Sosniak 1985, Gustin, 1985, Kalinowski 1985, Wallingford 1975 in Baker, 2003, 87). Ericsson theory of deliberate practice extends Simon and Chase's work by suggesting that it was not simply training of any type, but the engagement in deliberate practice that was necessary for the attainment of expertise. In the deliberate practice framework, future experts perform training that develops required skills under continuously evolving conditions where training stress and recovery are optimally balanced so that maximal training adaptations occur and training plateaus are minimized" (Baker 2003, 87).

Early specialization in some sports is considered to be essential, regardless of the risks (The Expert Advantage 26 may 2011). In sports like gymnastics or figure skating, where the athletes are competing at an international level from as young as 12 years of age and might be the champions by the age of 15, early specialization is considered to be beneficial because these sports require intensive involvement in training and competing at such young ages (Côte & Fraser-Thomas 2007, Law & al 2007 in The Expert Advantage 26 may 2011).

Early specialization is also a way to achieve early age-group success. If the athletes goal is to improve their performance fast early specialization will give the best chance to achieve success in that age-group. It can also provide short-term psychological rewards, increase self-esteem and motivate the athlete to continue doing sports. (Lench s.a.)

## **2.5 Predicting success and recommendations**

The common mindset in sports is that if you want to be a successful athlete you have to have an early start in sports and show talent at a young age to be seen as promising athlete who have a chance of succeeding in future. Swimming is often seen as a teenage sport where you're supposed succeed at a young age and if you don't start early or don't practise huge amounts, you might get categorized as being too old or not having potential.

In Moesch & al (2011, 6), study retrospectively examined the training hours in their main sport from childhood until they reached national team from Danish elite (defined as top 10 in the World or a European Championship medalist) and near-elite athletes from quantitative sports measured in centimeter, grams, or seconds. Interestingly, the results showed that participating in other sports in childhood didn't predict success and there wasn't any difference between these groups, but the results showed that the elite athletes specialized later than the near-elite athletes and trained significantly less hours in their main sport until the age of 15. By the age of 18 the elite team had caught up the near-elite in training hours. By that time, both groups had accumulated about 4100 (table 2) hours of practice showing that the elite group had a greater practice trajectory during that time.

There's much similar reports showing that sampling in multiple motor experiences is beneficial. The specialization age varies between Olympic sports with a large percentage of athletes actually start training after the "traditional timing of talent identification (8–12 y)" and there's a negative correlation between starting to train early and success (Vaeyens & al 2008 in Capranica & Millard-Stafford 2011, 574). "Although elite status in sports where peak performance is reached after maturity appears to be achieved with approximately 4,000 h of sport-specific training (Cote & al 2009, 10) little is known about the intensity or quality of training" (Capranica & Millard-Stafford 2011, 574).

Table 2. Athlete's training time during their career (Moesch & al 2011 in Capranica & Millard-Stafford, 2011)

		Elite	Near elite
Near-elite > Elite from age 9 - 15	(at 9)	113.98	272.32
Same at 18		4106.16	4192.94
Elite > Near-elite from 18 onwards	(at 21)	6334.81	5204.71
No difference in involvement in other sports		62.97 (1.57)	62.00 (1.42)

Similar findings were made in a survey by USA Olympic Committee for athletes who competed in Olympics from 2000-2012. In the survey they were examining at different factors during their career. The athlete's showed a strong multi-sport background and surprisingly late age of 11.4 (figure 2) when they were introduced to the sport they were competing in. The average length of time from when an athlete was first introduced to the sport until making first U.S. Olympic team was 14 years (11.4 – 25.5 years of age). (USA Olympic committee, 2014.)

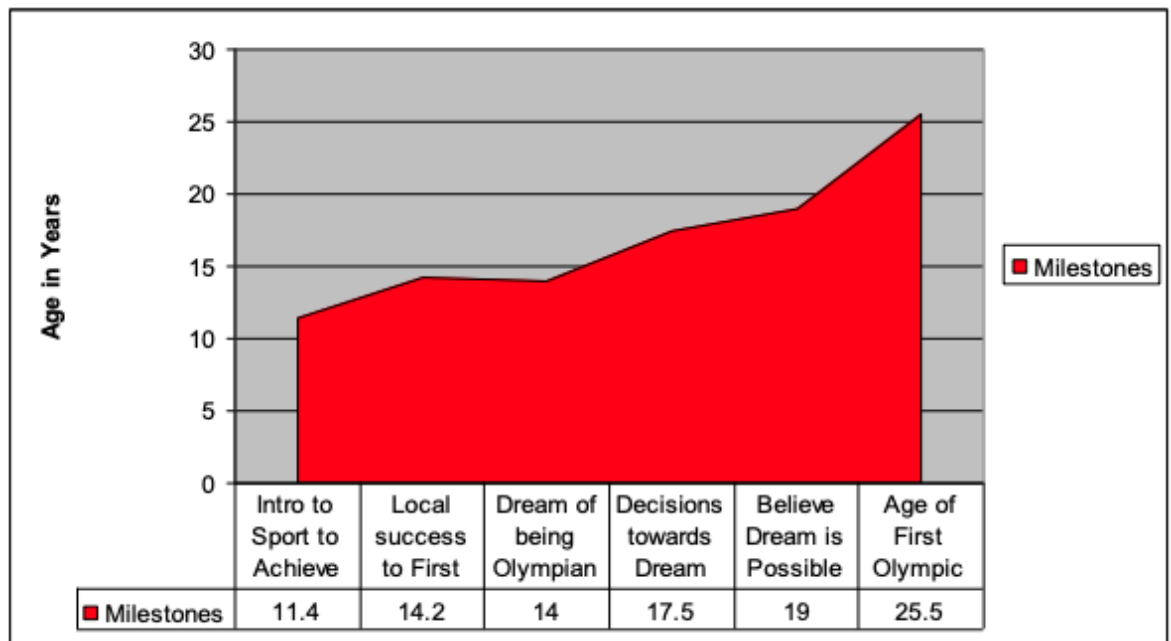


Figure 2. Introduction to main sport age for 2000-2012 USA Olympic athlete's (USA Olympic committee, 2014)

The findings indicate that surveyed Olympians were involved in an average of three sports per year until the age of 14. From 15-18 years of age, athletes reported participating in an average of 2.2 sports per year. Surveyed Olympians had decreased involvement to an average of 1.27 sports during ages 19-22 and 1.31 sports after age 22 (USA Olympic committee 2014; figure 3). Similar number were reported in Australia and Germany with

international level athletes (Malina 2010, 367). In Russia Barynina and Vaitsekhovskii's (1992 in Fraser-Thomas, Cote & Deaking 2008, 320), found that the swimmers who specialized later, reached international level faster, stayed in national team longer and retired later than early specializers.

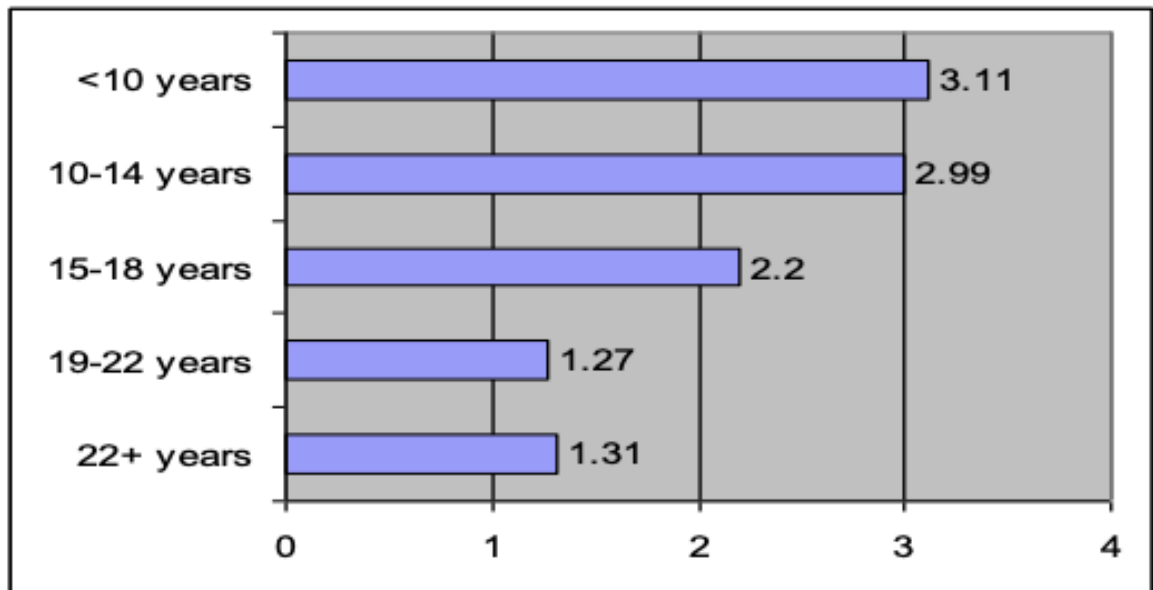


Figure 3. Sport participation of 2000-2012 USA Olympic athlete's (USA Olympic committee, 2014)

In a poll made by USA Swimming of the 2016 U.S. Olympic Swim Team, 83 percent of the athletes stated that they were multi-sport athletes growing up, presenting resounding statistical evidence from the higher level of the sport of the benefits of being a well-rounded athlete (USA Swimming, 2018).

In an observational retrospective study (Yustres, Martín, Fernández & González-Ravé 2017), their main goal of the research, was to determine whether the achievement of finalist positions in the Junior Championship was associated with the achievement of success in the FINA Senior World Championships. Data was collected from 2006 to 2013 for Juniors and 2007 to 2015 for Seniors. Out of 719 entries from 40 different countries, their study showed that only 17.1% of the swimmers have participated in Junior before to senior finalist World Championships.

This study didn't look into the athlete's training history, but we can hypothesize that you don't achieve junior or senior world championship level without extensive training background.

“Also worth noting is, children who specialize in a sport and experience a great deal of success at an early age may have difficulty coping with athletic failure later in life” (McMurtry 1978 in Hecimovich 2004, 36).

### **2.5.1 Recommendations**

“As more children and adolescents participate in sports and conditioning activities (sometimes without consideration for cumulative workload), it is important to establish age-appropriate training guidelines that may reduce the risk of sports-related injury and enhance athletic performance” (Gregory & al 2011, 74).

### **2.5.2 Sampling approach**

Côté and colleagues in Developmental Model of Sport Participation (Côté & Fraser-Thomas 2007, Côté 2003, Côté 2007 in Côté & al 2009, 8) suggest 3 phase pathway to being and elite athlete which takes into account the children’s physical and psychological development (figure 4). In the first phase called sampling years between the ages 6-12 years old children participate in multiple different sports where the practices have high amount of deliberate play and low amount of deliberate practice. Children who don’t want to continue specializing in sports, but still wants to do sports recreationally, moves on to recreational years phase (13+ years old) and those who want to continue to elite development continue to specializing phase (13-15 years old). In the specializing years the intensity rises, the amount of deliberate practice increases, but consists still deliberate play and there should be opportunity still in this phase to participate in more than one sport. The final phase is the investment years at 16+ years old. In this phase the athlete now fully commits only to one sport. There are number of examples and studies that show elite athletes have a multisport background (USA Swimming 2018; USA Olympic committee 2014; Capranica & Millard-Stafford 2011, 574; Côté & al 2009, 7). Although both, sampling and specializing early can lead to expertise (Ericsson 1993, Sosniak 1985, Gustin 1985, Kalinowski 1985, Wallingford 1975 in Baker 2003, 87; Côté, 2007 in Côté & al 2009, 10) theirs is still evidence that favors the sampling approach. Specializing early is an effective way to develop expertise, but it doesn’t take into account the possible negative psychological or biological consequences. Sampling on the other hand, has been described as effective way to develop sport expertise while taking into account the potential negative consequences. The sampling approach is linked to positive sport and psychological outcomes (Côté & al 2009, 10).

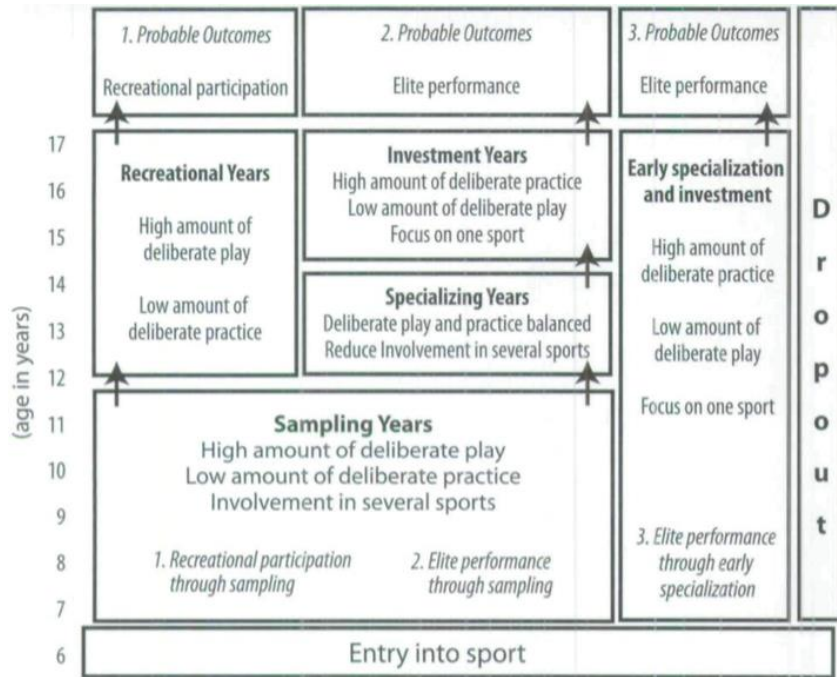


Figure 4. Côté's Developmental Model of Sport Participation (Côté & al 2009, 9)

Côté, Lidor & al (2009, 7; figure 5) "proposes seven postulates regarding the role that sampling and deliberate play, as opposed to specialization and deliberate practice, can have during childhood in promoting continued participation and elite performance in sport".

Postulate 1	Early diversification (sampling) does not hinder elite sport participation in sports where peak performance is reached after maturation
Postulate 2	Early diversification (sampling) is linked to a longer sport career and has positive implications for long-term sport involvement
Postulate 3	Early diversification (sampling) allows participation in a range of contexts that most favorably affects positive youth development
Postulate 4	High amounts of deliberate play during the sampling years build a solid foundation of intrinsic motivation through involvement in activities that are enjoyable and promote intrinsic regulation
Postulate 5	A high amount of deliberate play during the sampling years establishes a range of motor and cognitive experiences that children can ultimately bring to their principal sport of interest
Postulate 6	Around the end of primary school (around age 13 years), children should have the opportunity to either choose to specialize in their favorite sport or to continue in sport at a recreational level
Postulate 7	Late adolescents (around age 16 years) have developed the physical, cognitive, social, emotional, and motor skills needed to invest their effort into highly specialized training in 1 sport

Figure 5. Seven postulates of sampling and deliberate play (Myer & al 2015, 2)

### **2.5.3 Training amount recommendations**

Recommended training amounts for youth sport participation is based on research suggesting that youth should not play one sport more than eight months of the year, train more than 16 hours of organized sports in a week and training more hours than the athletes age of organized sports in a week, training more than this is a risk factor for injury. (Jayanthi & al 2012, 255; Myer & al 2015, 5; Bell & al 2016, Olsen & al 2006, Rose & al 2008 in Post & al 2017, 1405.) This training amounts are also recommended by contemporary long-term athlete development models until late adolescence (Côté & al 2009, Lloyd & Oliver 2012 in Blagrove & al 2017, 1). In (Post & al, 2017, 1409) they were able to demonstrate that “regardless of sport, the odds of reporting an injury were 62% to 90% higher among youth athletes who compete in 1 sport for more than 8 months of the year compared with athletes who did not exceed 8 months of participation in a single sport”. Previous research has shown that the amount of organized training hours and injuries are correlated and injury risk peaks in athletes who participate more than 16 hours a week in organized training (Rose & al 2008 in Post & al, 2017, 1406).

“Young athletes are encouraged to participate in a diverse range of sports and physical activities during childhood, and maintain this practice during early adolescence, which is believed to help support their physical, social, cognitive, and emotional development “(Lloyd & Colleagues 2015 in Blagrove, Bruinwells & Read 2017, 1). Some degree of specialization during adolescence is needed to reach elite level, but the timing of specialization is controversial. To avoid specializing too early, each athlete should be considered individually since timing of maturation is different with every athlete (Bergeron & Colleagues 2015 in Blagrove & al 2017, 6). Specialized training should start in late adolescence at 15+ year old and an environment that supports psychological development should be created (Côté & al 2009 in Blagrove & al 2017, 6). “Athletes should be taught to be respectful and co-operative while having the resilience and adaptability to self-regulate and cope in increasingly stressful situations as they mature” (Bergeron & al 2015 in Blagrove & al 2017, 6).

### **2.5.4 Summary list of recommendations**

- Encourage young people to try a range of sports so that they can discover what they enjoy and can develop the overall physical competence to maximize their success in the sports they choose to play after reaching age 15.
- Ensure that young people have a wide range of experiences and relationships across many organized sports (structured play) and informal games that are organized and maintained by the young people themselves.

- Evaluate youth sports programs in terms of how effectively they produce positive self-esteem, self-efficacy and perceptions of competence among young people.
- Support and encourage young people to participate in sport programs that focus on developing fundamental movement skills that lead to increased skill and ability (e.g., proper technique for running, throwing, stopping and changing directions).
- Inform young people about the sport participation options available to them, encourage them to diversify their experiences in sport and physical activities, and enable them to make participation choices based on knowledge of the risks associated with specialization, particularly for those younger than age 15.
- Organize and support youth sports in which practices and competitions focus on learning new skills, gaining confidence in one's abilities and fostering a lifelong love of physical activities among all participants regardless of their level of physical development and training experience.
- Reduce overuse injuries and increase overall physical competence and well-being by emphasizing the development of sport skills (agility, balance and speed), as well as aerobic fitness and flexibility, and muscle strength and power.
- Reduce burnout, boredom and dropping out from sports, and maximize the probability of personal development and success in a chosen sport by discouraging specialization in one sport until a young person can make a fully informed decision, usually at about age 15.
- Seek and support coaches who can explain how their sports improve overall physical fitness, and who also make it clear that athletic scholarships are not as plentiful or comprehensive as most people think, and that most scholarships cover only part of college expenses.
- Emphasize enjoyment and the love of movement and physical challenges so that young people will integrate physical activity and sport participation into their lives and be motivated to maintain overall fitness and well-being throughout the course of their lives.

(National Association for Sport and Physical Education, an association of the American Alliance for Health, 2010).

### **3 The aims of the project**

The present work was done to investigate the literature to see what does the literature say about early specialization in swimming and other sports. Based on the literature, the purpose was to make an educational material for the Finland's Swimming Association (Suomen Uimaliitto) which they can use for coaches education, athlete development and long-term development how they see fit.

The target was to find out what is specialization and when it should be done, what are the benefits or negative outcomes of early specialization and how to avoid them, what are the things that affect in people choice to start specializing early, how has specialization at different times affected the athletes success, physiological and psychological development in swimming and other sports and combine these into a material to point out which are the most favorable ways that supports athletes physical- and mental development and success.

As pointed out earlier in this work, early specialization in youth sport is increasing due to multiple reasons. Based on the authors personal experience in the field of coaching in Finland and Australia, talking with other coaches from multiple different countries and sports and education received in Haaga-Helia University sparked the interest for long-term development which lead to do this work. The first time the author was introduced to long-term development was at Finnish Swimming Association's coach education course and after all the knowledge gained from the field and education about this matter it was time to give something back where it all begun. Hopefully this material will influence coaches and people in the association to make changes in their coaching and re-evaluate their approach to long-term development.

## **4 Project planning and implementation**

The project started in the beginning of 2018 with a literature review about early specialization in sports and was which was the initial work. After that it got re-evaluated, the new work got defined more specifically to swimming and Finnish Swimming Association was included in to the process. For the information collection were used different type of studies, reviews of studies and literature and articles. Information was collected from Google Scholar, Pubmed and other relevant internet databases for the matter. Publishing years of the material was decided to be from 21<sup>st</sup> century due to the leaps made especially in sport psychology. Some exceptions were made if the material was still valid and related to the subject like the 10 000 hour rule or statistics. The physiological and psychological development in swimming and other sports was combined in to this material to point out which are the most favorable ways that supports athletes physical- and mental development and success.

### **4.1 Research questions**

- What is specialization and when it should be done?
- What are the benefits or negative outcomes of early specialization and how to avoid them?
- What are the things that affect in people choice to start specializing early?
- How has specialization at different times affected the athletes success?

### **4.2 Reliability**

The sources used for this work were emphasized to be from the 21<sup>st</sup> century with few exception. The exceptions included were either the original publication of a theory which is often cited and case studies with relevant and clear statistics. These selections were made to keep currency of the work.

Authors and publications were well known, often cited and offered in bibliographies. All the studies in their sub-subject (e.g. cause of injuries) came to similar conclusions which shows the commonality in the results. To avoid this work being bias, the research done was to look evidence supporting early specialization and not supporting early specialization to get balanced amount information from both aspects.

The sources were published very openly and are accessible for everyone to see. The content of the sources were professionally written relying mostly in previous evidence with very little personal opinions not backed by evidence and free of emotion.

Reasons for what the material was made for were the same as in this work, to find out the outcomes of early specialization.

## 5 Results

In this research the focus was on what coaches, governing bodies can affect. Based on the literature, the end result was a material going through the findings in this work and recommendations. After discussions with the swimming association, we decided that the material is a “raw material” which they can freely use to coach education, athlete development, long-term development or how they see fit. The material ended up being 11 pages summarizing the findings and recommendations of this work.

The major findings and recommendations in literature were put into this material and now works as an educational material in Finnish Swimming Association. There's benefits from early specialization, but there's also negative outcomes and there's better alternative solutions. If the goal is to be expert in one sport, you can acquire those skills by specializing early and reach international level or to get early age group success and possible psychological rewards from success. However, this excessive amount of training is shown to cause lack of overall motor development, injuries, overtraining, burnouts, dropouts, possible social isolation, less sense of one's identity, lack of motivation and shorter careers. In early specialization sports, early specialization is considered to be essential regardless of the negative outcomes since the athletes peak at early- or mid-puberty and you can't reach elite level without specialization, even in late specialization sports so the athlete has to train a lot before that if the goal is to reach international level.

In late specialization sports the healthier and more favorable approach is to specialize later at late-puberty. This way the negative outcomes of early specialization can be avoided, athletes are more likely to be involved in physical activity after their careers which improves their long-term health, athletes have longer careers and are more likely to succeed. Most of the elite athletes have a multisport background and they have specialized later in late-puberty.

The alternative to early specialization which is more favored by the evidence, is the sampling approach and participate in multiple activities until late puberty and then decide the sport in which the athlete wants to specialize in.

Factors influencing early specialization are the still used old ways in youth sports like how things were done in Eastern Europe well known sporting programs and the 10 year rule which was later extended to 10 000 hour rule, the potential financial benefits and other valuable benefits like scholarships and the attitude and involvement of the most influential people in the young athletes life, mostly parents, but also coaches.

## 6 Discussion and conclusions

Early specialization is growing popularity in youth sports even though there's increasing numbers of research made on its negative outcomes. Sampling or diversification is clearly the better option in comparison between these two approaches, but in practical terms it will be hard to get this practice "in the field" to parents and coaches since the roots of early specialization are partially feeling and hope based where we try to achieve outside of sports based benefit such as scholarships or other material benefits. This unfortunately comes at the expense of the young athlete's physical and psychological development and enjoyment of the sport. As the children starts to get older there should be more emphasis on deliberate practice and when they are younger we should emphasise more unstructured free play like practices. The 10 000 hour rule is a well known "fact" among coaches and this drives us to get the hours in as soon as possible. We have adopted this businesslike approach into youth sports where we try to get as much "profit" as possible as soon as possible and this drives us to achieve results and success instead of trying to emphasise the enjoyment, diverse skill development and psychological development. Youth sports should be seen as a fun activity that develops important life skills and healthy life style.

However, early specialization isn't all bad since there's some instances when early specialization is beneficial. Most beneficial early specialization is in early specialization sports like gymnastics, figure skating, diving and table tennis where the athlete's peak at very young age. It can also been used in short periods of time to enhance physical performance to break plateaus and as variation of stimulus, but in these cases it should be used carefully.

There's wealth of evidence supporting both early specialization and diverse sporting background although there seems to be more studies and articles about supporting sampling approach and about the negative outcomes of early specialization. The sources which were pro early specialization seemed to refer mostly to the 10 000 hour rule and Ericsson's studies. The articles and studies talking in favor of early specialization usually addressed mastering skills or level attained and left out any physical or mental benefits or negative outcomes. A number of studies were questionnaire based answered by children or ex-athletes who have to try and remember how did they practice years ago. This might affected the results. In this research, possible other reasons for sport participation like the effect friends, social status or income levels were not included since they're mostly out

reach for coaches and governing bodies. The cognitive side of sports such as game sense which has a big role especially in team sports, was not taken into account when addressing the level or success attained.

We have to remember that there's no "one size fits all" solution since all of us are individuals so our approach to specialization should be "playing the odds". The research seems to favor the sampling approach to youth sports when it comes to the wellbeing of the athlete's and potential adult success.

Education of coaches who work with young children should be done more since the current trend in youth sports is to treat children like "mini adults", which causes the coaches to do similar practice plans for children as they would for adults except in smaller quantities. We know now more than ever of the pitfalls of early specialization, but now our challenge is to get the information to the "field". Suggestion for future research would be combining different specialization models, practice content and the relation of deliberate play and deliberate practice.

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## **Appendix**

### **Material for Finland's Swimming Association (in Finnish)**

Tämä materiaali on hieman vapaammin kirjoitettu perustuen tehtyyn kirjallisuuskatsaukseen. Kuten sovittu, tehtävän tavoitteena oli tehdä kirjallisuuskatsaus aikaisesta erikoistumisesta ja tehdä materiaali jota voitte vapaasti käyttää Uimaliiton koulutuksiin tai koulutusmateriaalien tekoon, jotta kouluttajat ja valmentajat saisivat syvällisemmän katsauksen aiheeseen ja saisimme tätä tietoa välitettyä sinne altaan reunalle asti.

Materiaalissa käydään läpi:

- Mistä aikainen erikoistuminen on peräisin
- Mitä fyysisiä vaikutuksia aikaisella erikoistumisella on
- Mitä henkisiä vaikutuksia aikaisella erikoistumisella on
- Mitä hyötyjä aikaisella erikoistumisella on
- Menestyksen ennustaminen harjoittelumäärän, lajiharjoittelu aloitustiän ja muiden harrastettujen lajien perusteella
- Suositukset

### **Mistä aikainen erikoistuminen on peräisin?**

#### **Itä-Eurooppa**

Itä-Euroopan entisten kommunististen valtioiden kohtalainen menestys on vaikuttanut näkemykseemme aikaisen erikoistumisen tarpeeseen. Kyseisellä alueella aloitettiin hyvin systemaattinen vuoden ympäri tapahtuva harjoittelu nuoresta iästä alkaen. ”bensaa liekkeihin” heitti media, joka toi esille nuoria lahjakkuuksia ja vahvisti ajatusta aikaisen erikoistumisen tarpeesta jotta voidaan menestyä. Lajista riippuen erikoistumisiässä oli kuitenkin poikkeuksia. Heillä oli lajeja joissa painotettiin myöhempää erikoistumista ja monilajitaustaa, mutta oli myös lajeja joissa erikoistuminen aloitettiin aikaisin. Näitä lajeja olivat voimistelu, uimahyppy, taitoluistelu ja jossain määrin uinti. Tämä ajattelumalli alkoi leviämään maailmalla, kun Itä-Eurooppalaiset valmentajat ja tutkijat muuttivat länteen ja alkoivat työskentelemään eliittuurheilijoiden kanssa. (Bompa 1995, Bompa 1985, Drapik 1996, Hartley 1988 in Malina, 2010; 364.)

#### **Vanhemmat**

Vanhemmillä on iso rooli aikaisessa erikoistumisessa urheilussa ja elämän muilla alueilla. Lahjakkaiden nuorten kotioloissa on kolme yhteistä tuntomerkkiä: lapsi-keskeiset vanhemmat ohjasi lapsia omilla kiinnostuksilla ja olivat erittäin sitoutuneita lastensa harjoitteluun, he keskittyivät lastensa kehitykseen ja arvostivat menestystä. (Sloane 1985 in Malina 2010, 365.) Menestyksenhaluiset vanhemmat näkevät, että aikainen aloitus aktiviteetteihin on tarpeellista saadakseen etulyöntiaseman. Tiger Woodsin ja Williamsin sisarusten kaltaiset tarinat aikaisesta lajin aloituksesta, huikeista harjoitusmääristä ja hyvin säännöstelty elämästä heidän lapsuudessa ja teini-iässä on hyvin tunnettu. Nämä ja muut tarinat on todennäköisesti vaikuttaneet tarpeeseen aloittaa harrastaminen nuorena. (Malina, 2010, 365.) Tähän tottakai vaikuttaa myös muuta aikuiset, perhe, kaverit jne.

### **“Leimaantuminen”**

Lasten “leimaaminen” lahjakkaaksi nuorella iällä urheilussa, musiikissa tai muussa aktiviteetissa voi vaikuttaa aikaiseen erikoistumiseen (Malina, 2010, 365). Kun nuori näyttää lahjakkuutta tai paremmin sanottuna osaavansa jonkun asian hyvin, häneen helposti aletaan kiinnittää enemmän huomiota, koska hänet nähdään olevan potentiaalinen menestymään. Useimmat meistä tietää omasta elämästään, on kuullut, nähnyt videon tms. ”seuraavasta Jani Sievisestä”, Teemu Selänteestä tai muusta huipusta ja muutaman vuoden päästä heistä ei kuulu mitään tai heidät on unohdettu.

### **Taloudelliset hyödyt**

Suomessa ja varsinkaan uinnissa tämä tuskin näyttelee suurta roolia meidän urheilijoiden apurahojen takia ja ottaen huomioon, että uinti ei mikään raha-laji ole. Isommista lajeista kuten jääkiekossa tai jalkapallossa, ja ulkomailla, missä ei ole samanlaista sosiaaliturvaa kun Suomessa tämä saattaa näytellä isompaa roolia aikaisessa erikoistumisessa. Se voi olla houkuttelevaa lapsille ja aikuisille kuulla kuinka paljon ammattuurheilijat ansaitsevat, ulkomailla stipendin saaminen esimerkiksi opiskeluihin (Sokolove 2010, s.a.) tai palkintorahat köyhiltä alueilta/maista tuleville voi siivittää päätöstä erikoistua aikaisin.

### **10 000 tunnin sääntö**

Väitteelle siitä että 10 000 tuntia ja/tai 10 vuotta harjoituskokemusta on välttämätöntä kansainväliselle menestykselle löytyy tieteellistä näyttöä urheilusta, musiikista, shakista ja muilta aloilta (Starks & Ericsson 2003 in Malina 2010, 366). Tämä sääntö on hyvin tunnettu ja jopa lajiliitot mainostavat tätä. 10 000 tunnin sääntö uskotaan vaikuttaneen aikaiseen erikoistumiseen.

## **Mitä fyysisiä vaikutuksia aikaisella erikoistumisella on?**

Aikaisella erikoistumisella on fyysisiä seurauksia. Liiallisella harjoittelulla on todettu olevan vakavia seurauksia lasten ja nuorten biologiselle kehitymiselle. (Malina 1994, 409-414.)

## **Motoriset taidot ja koordinaatio**

Yksi pää-perusteluista erikoistumiselle on motoristen taitojen kehittyminen tiettyyn lajiin. Urheilijat oppivat lajispesifit taidot paremmin kun harjoittelun määrää ja frekvenssiä nostetaan verrattuna urheilijoihin jotka harjoittelevat satunnaisesti. Eli mitä enemmän lajia harjoitellaan sen paremmaksi siinä tulet. Näyttöä kuitenkin löytyy sille, kun erikoistutaan aikaisin vain yhteen lajiin, se rajoittaa kokonaisvaltaisesti motoristen taitojen kehittymistä. Tämän puolestaan on todettu vaikuttavan fyysiseen aktiivisuuteen ja sitä kautta terveyteen pitkällä aikavälillä, vähentämällä todennäköisyyttä osallistua muuhun liikuntaan. (Wiersma 2000, 14-16.)

Asiaa tutkittaessa on huomattu, että lapset jotka ovat harrastaneet monipuolisesti liikuntaa verrattuna erikoistuneisiin lapsiin, olivat he vahvempia, nopeampia, ketterämpiä, heillä oli parempi kestävyys ja liikkuvuus ja heillä oli kehittyneemmät motoriset taidot kokonaisvaltaisesti (Fransen & al 2012, 381). Paremmat motoriset taidot myös ennustavat parempaa menestystä joukkue- ja yksilölajeissa (Lidor, Côté & Hackfort 2009, 139). Yleisesti ajatellaan että tiettyjä fyysisiä ominaisuuksia pitää harjoitella tietyssä ikävaiheessa (herkkyyskausiteoria), mutta tieteellinen näyttö ei tue tätä näkemystä (Hecimovich 2004, 35). Jonkun verran plastisuutta on havaittu nuorissa, mutta peliä ei ole missään nimessä menetetty jos herkkyyskausi on mennyt ohi ja sille spesifejä ominaisuuksia ei ole harjoiteltu.

## **Kasvu ja kehitys**

Aikaisen erikoistumisen yhteydessä puhutaan myös sen vaikutuksesta nuorten kasvulle ja kehitykselle. Voimistelijoiden ja balettitanssijoiden lyhyys ja myöhäinen kehitys otetaan usein esimerkiksi kun puhutaan nuorten intensiivisestä harjoittelusta (Theintz & al in Goodway & Robinson 2015, 274; Malina 1994, 409-414.).

Monissa tutkimuksissa on kuitenkin todettu, että uimarit ovat turvassa tältä seuraukselta. Joissain tutkimuksessa on jopa todettu, että uimarit ovat pidempiä ja painavampia kuin keskiarvo nuori ja puberteetti on alkanut jopa aikaisemmin verrattuna muihin urheilulajeihin (Malina 1994, 401-409; Baxter-Jones, Helms, Maffulli, Baines-Preece & Preece 1995, 390). Lajivalintaan ja kehitykseen on tietysti voinut vaikuttaa nuoren genetiikka.

Joissain tutkimuksissa on löydetty todisteita sille, että tytöillä jotka aktiivisesti harrastavat urheilua, kuukautiset alkavat myöhemmin verrattuna tyttöihin jotka eivät ole aktiivisia urheilijoita. Tämä on johtanut huoliin intensiivisen harjoittelun vaikutuksesta fyysiseen kehitykseen ja kypsyyteen. Huono ruokavalio, harjoittelukuorma ja alhainen kehon rasvan määrä on hypoteesi tämän syyksi. (Hecimovich 2004, 35-36.)

Todisteita siitä, että aikainen erikoistuminen haittaa nuorten kasvua ja kehitystä on, mutta se on vähäistä (Malina 1994, 392-419; Kaleth & Mikesky 2010, 30).

## Loukkaantumiset ja yliharjoittelu

Rasitusvammat ovat yleisimmät loukkaantumiset urheilevilla lapsilla ja nuorilla. Rasitusvammojen määrä on nousussa, koska nuoret harjoittelevat vuoden ympäri, parhaimmillaan monissa lajeissa samaan aikaan (Brenner 2007, 1243). Tieteellinen näyttö tukee ajatusta, että erikoistuminen ja harjoittelu volyyymi on yhteydessä loukkaantumisiin ja ylikuntoon. Lapset ja nuoret jotka erikoistuvat aikaisemmin ja harjoittelevat enemmän, loukkaantuvat ja menevät ylikuntoon todennäköisemmin (Post & al 2017, 1408; Kuva 1). Loukkaantumiset tulevat useimmiten tuki ja liikunta elimistöön.

Kuva 1. Erikoistumisajankohdan ja loukkaantumisten suhde (Post & al 2017, 1410)

	History of Any Injury	History of Overuse Injuries	History of Upper Extremity Overuse Injuries	History of Lower Extremity Overuse Injuries	History of Concussions
Odds Ratios for Specialization Category, Volume Recommendations, and History of Various Injury Types <sup>a</sup>					
Specialization					
Low	—	—	—	—	—
Moderate	1.32 (1.05-1.67) <sup>b</sup>	1.39 (1.02-1.90) <sup>b</sup>	1.46 (0.85-2.61)	1.39 (0.99-1.98)	0.81 (0.52-1.27)
High	1.59 (1.26-2.02) <sup>c</sup>	1.45 (1.07-1.99) <sup>b</sup>	1.91 (1.14-3.35) <sup>b</sup>	1.37 (0.98-1.95)	1.27 (0.85-1.94)
Volume recommendations					
Playing >8 mo					
No	—	—	—	—	—
Yes	1.85 (1.50-2.27) <sup>c</sup>	1.60 (1.21-2.14) <sup>d</sup>	1.68 (1.06-2.80) <sup>b</sup>	1.66 (1.22-2.30) <sup>d</sup>	1.61 (1.08-2.47) <sup>b</sup>
Organized sports >16 h/wk					
No	—	—	—	—	—
Yes	1.36 (1.13-1.64) <sup>d</sup>	1.38 (1.09-1.74) <sup>d</sup>	1.43 (0.98-2.09)	1.44 (1.12-1.86) <sup>d</sup>	1.21 (0.87-1.68)
More hours per week of organized sports than age					
No	—	—	—	—	—
Yes	1.34 (1.12-1.61) <sup>d</sup>	1.26 (1.01-1.59) <sup>b</sup>	1.41 (0.97-2.08)	1.30 (1.00-1.67)	1.29 (0.93-1.79)
Organized sport:free play ratio >2:1					
No	—	—	—	—	—
Yes	1.00 (0.83-1.20)	0.94 (0.74-1.18)	0.83 (0.57-1.21)	0.99 (0.77-1.28)	1.06 (0.76-1.48)

<sup>a</sup>Values are reported as odds ratio (95% CI). Models for specialization were adjusted for age, sex, and hours per week in organized sports, while models for volume recommendations were adjusted for age and sex. For specialization, "low" serves as the reference category. For each of the volume recommendations, "no" serves as the reference category.

Uinnissa ei tule samanlaista iskutusta keholle kuin maalla suoritettavissa urheilulajeissa (paitsi käänöksissä ja starteissa), joten uinnissa loukkaantumiset liittyvät suureen toistojen määrään. Uinnissa on tehty vain vähän spesifisti nuorten loukkaantumisiin liittyviä tutkimuksia, mutta tutkimuksia joissa on huomioitu paljon eri ikäisiä uimareita esim. 13-25 vuotiaita on tehty (Feeley & al 2015). Suurin osa uimareista on kokenut vähintäänkin kipua olkapäissä (Feeley & al 2015, 6) ja vaikka kyseessä ei olisi loukkaantuminen vielä tässä vaiheessa, se on merkki orastavasta loukkaantumisesta. Uinti on tunnettu siitä, että harjoittelu alkaa nuorella iällä, harjoitteluvolyymi on suuri ja aikaa harjoitteluun käytetään paljon eli meidän pitää olla varovaisia loukkaantumisten kanssa. Jos uimarit valittavat olkapääkivuista tai jos loukkaantumisia alkaa ilmenemään, on syytä tarkastella harjoitusvolyymia, harjoitusaikaa ja suunnitella tukevaa toimintaa niiden estämiseksi. Toistuva korkean volyymin ja intensiteetin harjoittelu voi johtaa myös ylikuntoon. Yhden tutkimuksen mukaan 37% 16-20 vuotiaista eliitti uimareista kärsi ylikunnosta (Kentta, Hassmen & Raglin 2001 In Smith 2018). Yksi yleisimmistä ylikunnon merkeistä on uimarin huononevat tulokset kilpailuissa (Flynn & al 1994, Hooper & al 1993, Hooper & al 1995, Morgan & al 2013, O'Connor & al 1989, Li & al 2012 In Smith, 2018).

### **Mitä henkisiä vaikutuksia aikaisella erikoistumisella on?**

Vain pienestä osasta lapsia tulee ikinä ammattiuurheilijaa, joten harjoittelun psykologiset vaikutukset ovat erittäin tärkeitä ottaa huomioon. Tutkimukset osoittaa, että lapset joilla on monta harrastusta (urheilu, musiikki, taide jne.) menestyvät paremmin koulussa ja heillä on positiivisemmat vertaissuhteet kuin niillä lapsilla joilla on vähemmän harrastuksia. Tämän uskotaan johtuvan jokaisen harrastuksen omanlaisesta sosiaalisesta ympäristöstä ja taidoista ne opettavat (Fredricks & Eccles 2006, Rose-Krasnor & al 2006 in Coté & al 2009, 9).

### **Elämäntaidot**

Lapsilla jotka osallistuvat useampaan harrastukseen on suurempi todennäköisyys kehittää elämäntaitoja kuten ajanhallintaa, kommunikaatiotaitoja ja johtajuutta. (Yoo 2001 in Coté & al 2009, 9) huomasivat, että yksilö- ja joukkueurheilijoilla olivat erilaiset selviytymisstrategiat jotka on opittu heidän lajeissaan. Tämä näyttää, että lapset kehittävät enemmän elämäntaitoja osallistumalla moneen harrastukseen sen sijasta että erikoistuu vain yhteen harrastukseen (Coté & al 2009, 9).

### **Identiteetti ja sosiaalisuus**

Monien roolien ja identiteettien kokeilu ja tutkiminen (esim. Urheilija tai muusikko) auttaa lapsia selvittämään todellista identiteettiään ja lapset jotka ovat sitoutuneet harrastukseen joka vie suuren osan teidän ajastaan, kehittävät yksipuolisemman identiteetin. (Waterman 1984, Harter 1990 in Coté & al 2009, 10). Varhaisessa vaiheessa tapahtunut erikoistuminen voi tukahduttaa sosiologisen ja psykologisen kehityksen vähentämällä kehityksen mahdollisuutta näillä alueilla. Urheilu on erinomainen paikka harjoitella sosiaalisia taitoja kuten yhteistyötä ja sosiaalisesti hyväksyttävää käytöstä, mutta liikaa harjoiteltaessa ei välttämättä jää niin paljoa aikaa sosiaaliselle kasvulle, mikä voi johtaa sosiaaliseen eristäytymiseen. (Wiersma 2000 in Baker 2003, 88.) Lapsilla jotka harrastaa montaa lajia on mahdollisuus kerätä enemmän sosiaalista pääomaa (sosiaalisia verkostoja ja niissä syntyvää luottamusta ja vastavuoroisuutta) koska he ovat vuorovaikutuksessa useampien lasten ja aikuisten kanssa (Coté & al 2009, 9).

### **Dropout**

Lisäksi yksi tärkein todiste varhaisessa vaiheessa tapahtuvaa erikoistumista vastaan on dropout -ilmiö. Urheilija siirtyy toisen lajin pariin tai lopettaa kokonaan, jos ei koe urheillessaan nautintoa. Nautinnon puute on vallitseva motiivi tarkasteltaessa lopettaneita urheilijoita. Tutkimukset dropouteista tuovat jatkuvasti esiin, että suurin syy urheilun lopettamiselle on hauskuuden tai nautinnon vähyys, epäonnistumisen tunteet, paineet (kovat odotukset) ja alhainen taitotaso tai vähäinen menestys (Monteiro & al 2017; Salguero & al 2003; Ewing & Seefeldt 1996, Gould 1987, Weiss & Petlichkoff 1989, Butcher & al 2002 in Baker, 2003, 88). Tyttöjä häiritsi poikia enemmän paineet (kovat odotukset), kova harjoittelu, kisailun epämiellekkyyys, ei menestynyt ja ei tuntenut itseään tärkeäksi (Salguero & al 2003, 533).

### **Burnout**

Burnout ei tapahdu yhtäkkiä vaan kehittyy pitkällä aikavälillä ja loppuunpalanut urheilija ajattelee, että hän ei selviä fyysisestä- tai henkistä vaatimuksista jotka on hänelle asetettu joko muiden tai hänen omasta toimestaan (Gould & Dieffenbach 2003, Weinberg 1995 in Malina 2010, 368). Monet asiat vaikuttavat burnoutin syntyyn, mutta kolme epäiltyä pää-syytä ovat: negatiiviset arvioinnit suorituksesta, kriittinen palaute rakentavan sijaan ja ylikunto tai yliharjoittelu. Vähentyneet tai vähäiset menestyksen tunteet ja niihin liittyvä palkitseminen ovat myös vaikuttavia tekijöitä (Malina, 2010, 368). Merkkejä kroonisesta stressistä ovat mm. ärtyneisyys, unihäiriöt, vähentynyt kiinnostus

harjoitteluun, masennus, energian vähyys, ihottumat, huonovointisuus ja jatkuva sairastelu (Gould & Dieffenbach 2003, Weinberg 1995 in Malina, 2010, 368).

### **Mitä hyötyjä aikaisella erikoistumisella on?**

Aikaisessa erikoistumisessa on ominaista aikainen sitoutuminen vain yhteen lajiin jossa harjoitellaan suuret määrät päämäärätietoista harjoittelua ja hyvin vähän leikinomaista harjoittelua. Aikainen erikoistuminen on tehokas ja mahdollistaa ura huippu-urheilijana, mutta aikaista erikoistumista on kritisoitu sen mahdollisista fyysisistä ja henkisistä haittavaikutuksista. (Côté & al 2007 in Karell, 2016, 10).

Yksi tärkeimmistä tutkimuksista, joka perustelee varhaisen erikoistumisen tärkeyttä, on Ericssonin (1993 in Baker 2003, 87) tutkimus tavoitteellisesta harjoittelusta. Useiden tutkimusten mukaan urheilijoiden tulisi harjoitella intensiivisesti ja tavoitteellisesti vähintään 10 vuotta tai 10 000 tuntia saavuttaakseen kansainvälisen tason. Tämän säännön on todistettu toimivan myös muilla aloilla kuten musiikissa, matematiikassa ja shakkissa. (Ericsson 1993, Sosniak 1985, Gustin 1985, Kalinowski 1985, Wallingford 1975 in Baker 2003, 87).

Aikainen erikoistuminen on myös hyvä tapa saavuttaa menestystä nuorena, jos nuoren tavoitteena on parantaa tämän hetkistä tasoansa, aikainen erikoistuminen antaa urheilijalle ja hänen valmentajalleen parhaan mahdollisuuden nuorena menestymiseen. Se voi tarjota myös nopeata psykologista tyydytystä ja mahdollisuuden parempaan valmennukseen. Nykynuorten urheilu mittaa menestystä ja suorituskykyä joilla voi saada paikan paremmasta seurasta, joukkueesta tai maajoukkueesta joilla on parempaa valmennusta ja pääsy eri kilpailuympäristöihin. Aikainen menestys voi johtaa kasvaneeseen itsetuntoon, itsevarmuuteen ja voi motivoida jatkaa urheilua. (Lench s.a.)

### **Menestyksen ennustaminen**

Yleinen ajattelumalli urheilussa on, jos haluaa menestyä pitää lajiharjoittelu aloittaa aikaisin, varsinkin uinnissa ja näyttää potentiaalia menestymiseen. Jos aloitat urheilun vanhempana tai et menesty nuorena, nuori saatetaan leimata liian vanhaksi tai ettei hänellä ole potentiaalia.

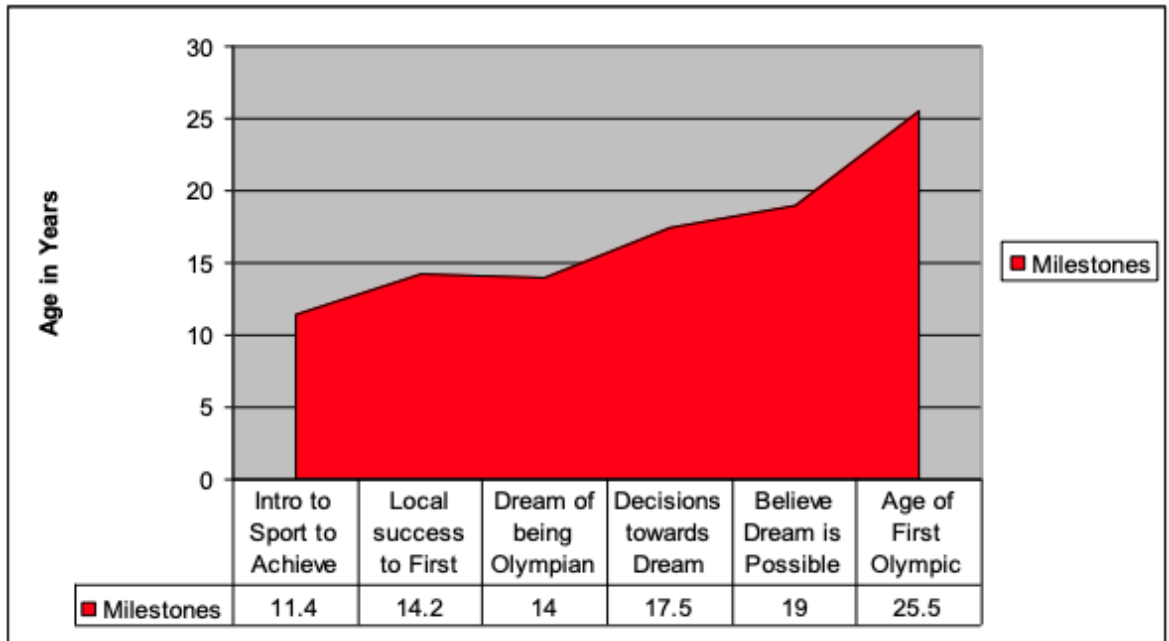
Moesch & al (2011, 6), tutkivat Tanskalaisten eliitti (Top 10 maailmassa tai Euroopan Mestaruus mitalisti) ja lähes-eliitti urheilijoiden harjoitustaustoja heidän uransa aikana. Osallistumisella muihin lajeihin ei näyttänyt ennustavan menestystä kummassakaan

ryhmässä, mutta eliitti urheilijat erikoistuivat myöhemmin ja harjoittelivat vähemmän pääalajiaan 15 ikävuoteen asti. 18 ikävuoteen mennessä he olivat kerryttäneet saman verran harjoitustunteja (n. 4100 tuntia) mikä osoittaa suurempaa harjoitusmäärän kasvamista eliitti urheilijoilla 15-18 ikävuoden aikana (kuva 2). Lajispesifi harjoittelun aloitusikä vaihteli Olympia-lajien välillä ja eliitti urheilijat olivat aloittaneet ”perinteisen” 8-12 ikävuoden jälkeen. Mikä osoitti negatiivisen korrelaation aikaisen harjoittelun ja myöhemmän menestyksen välillä.

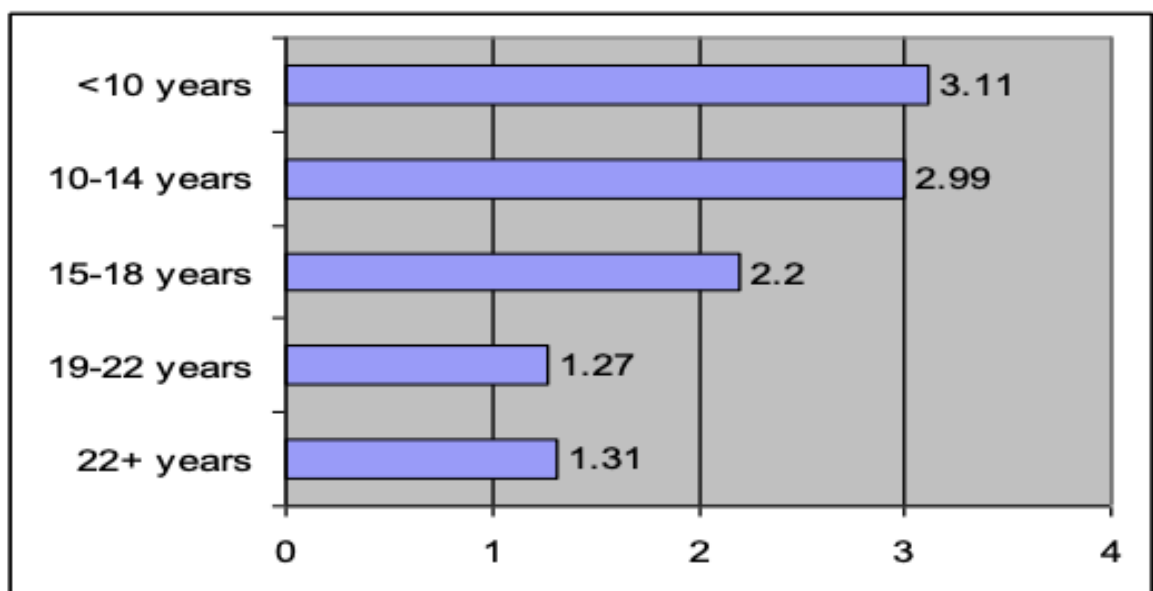
Kuva 2. Urheilijoiden harjoittelumäärät uran aikana (Moesch & al in Capranica and Millard-Stafford 2011)

		Elite	Near elite
<b>Near-elite &gt; Elite from age 9 - 15</b>	(at 9)	113.98	272.32
<b>Same at 18</b>		4106.16	4192.94
<b>Elite &gt; Near-elite from 18 onwards</b>	(at 21)	6334.81	5204.71
<b>No difference in involvement in other sports</b>		62.97 (1.57)	62.00 (1.42)

Samalaiseen tuloksiin päätyi USA:n Olympiakomitea (USA Olympic Committee, 2014) kyselyssä joka tehtiin urheilijoille jotka osallistuivat Olympialaisiin vuosina 2000-2012. Urheilijoilla oli monta urheiluharrastusta nuorena keskiarvolla 3 harrastusta 14 vuotiaaksi asti ja keskimäärin 2 harrastusta 18 vuotiaaksi asti (Kuva 4). Urheilijat olivat aloittaneet pääalajinsa keskimäärin 11.4 vuotiaana ja heillä kesti n.14 vuotta päästä USA:n Olympiajoukkueeseen 11.4-25.5 vuotiaana (Kuva 3). Saman tyyppisiä tuloksia on myös Australiasta ja Saksasta (Malina 2010, 367). Venäjällä Barynina ja Vaitsekhovskii's (1992 in Fraser-Thomas, Cote & Deaking 2008, 320) huomasivat, että uimarit jotka erikoistuivat myöhemmin pääsivät kansainväliselle tasolle nopeammin, he pysyivät maajoukkueessa pidempään ja he lopettivat urheilun myöhemmin kuin aikaisin erikoistuneet. Vuonna 2016 Olympialaisiin osallistuneilla USA:n uimareilla 83% :lla on monilajitausta (USA Swimming, 2018).



Kuva 3. Keskimääräinen USA:n 2000-2012 Olympiajoukkueen päälajin aloittamisikä (USA Olympic committee, 2014)



Kuva 4. Keskimääräinen USA:n 2000-2012 Olympiajoukkueen harrastusten määrä uran aikana (USA Olympic committee, 2014)

Yustres, Martín, Fernández & González-Ravé (2017, s.a.) tutkivat onko uinnin nuorten maailmanmestaruuskisoissa menestymisellä ja aikuisten maailmanmestaruuskisoissa menestymisellä yhteyttä. Tutkimus osoitti, että vain 17.1% nuorten kisoissa menestyneet uusivat menestyksensä aikuisten kisoissa. Tiedot kerättiin yhteensä 719 uimarista, 40 maasta vuosina 2006-2013 (nuoret) ja vuosina 2007-2015 (aikuiset).

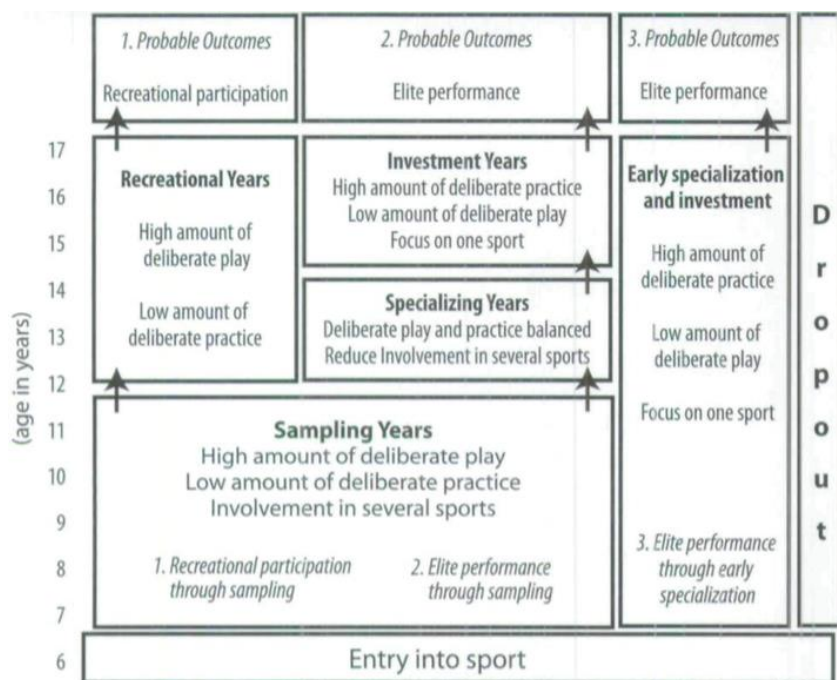
Huomionarvoista on myös, niillä lapsilla jotka ovat menestyneet nuorena on vaikeuksia käsitellä pettymyksiä myöhemmin elämässä (Mcmurtry 1978 in Hecimovich 2004, 36).

## Suosituksia

### Kokeilumalli (Developmental Model Of Sport Participation)

Kokeilumalli on urheilijanpolku jossa urakehitys jaetaan karkeasti kolmeen osaan: kokeiluvaiheeseen, erikoistumisvaiheeseen ja panostamisvaiheeseen. Kokeiluvaiheessa (noin 6-12v) Liikunnassa painotetaan hauskanpitoa ja harjoittelu on leikinomaista. Erikoistumisvaiheessa (noin 13-15v) harjoittelun intensiteetti nousee, harjoittelusta tulee hieman totisempaa ja harrastettavien lajien määrää vähennetään. Panostusvaiheessa (16:sta ikävuodesta eteenpäin) panostaminen lajiin on hyvin tavoitteellista. (Aarresola & Konttinen 2012, 16-17 in Karell, 2016, 10; Kuva 5). Urheilijanpolku-mallin jossa suositaan osallistumista useaan lajiin nuorena suosio on kasvamassa maailmalla. Kokeilumalli ottaa huomioon nuorten fyysisen ja psyykkisen kehityksen ja hyvinvoinnin samalla mahdollistaen uran huippu-urheilijana. (Côté & al, 2007 in Karell 2016, 10.)

Molemmat tavat, aikainen erikoistuminen ja kokeilumalli tai myöhäinen erikoistuminen ovat tehokkaita tapoja oppia taitoja ja menestyä, mutta aikainen erikoistuminen ei ota huomioon mahdollisia negatiivisia vaikutuksia fyysiselle ja henkiselle kehitykselle (Côté & al 2009, 10).



Kuva 5. Côtén Developmental Model of Sport Participation

Kuva 6. Côté & al (2009) esittää 7 väitettä liittyen kokeilumalliin urheilijan uran aikana

Postulate 1	Early diversification (sampling) does not hinder elite sport participation in sports where peak performance is reached after maturation
Postulate 2	Early diversification (sampling) is linked to a longer sport career and has positive implications for long-term sport involvement
Postulate 3	Early diversification (sampling) allows participation in a range of contexts that most favorably affects positive youth development
Postulate 4	High amounts of deliberate play during the sampling years build a solid foundation of intrinsic motivation through involvement in activities that are enjoyable and promote intrinsic regulation
Postulate 5	A high amount of deliberate play during the sampling years establishes a range of motor and cognitive experiences that children can ultimately bring to their principal sport of interest
Postulate 6	Around the end of primary school (around age 13 years), children should have the opportunity to either choose to specialize in their favorite sport or to continue in sport at a recreational level
Postulate 7	Late adolescents (around age 16 years) have developed the physical, cognitive, social, emotional, and motor skills needed to invest their effort into highly specialized training in 1 sport

Väite 1. Kokeilumalli ei haittaa mahdollisuutta menestyä lajeissa jossa huippu saavutetaan kypsymisen jälkeen.

Väite 2. Kokeilumalli on yhteydessä pidempään urheilu-uraan ja vaikuttaa positiivisesti pitkän ajan urheiluun sitoutumisena.

Väite 3. Kokeilumalli sallii osallistumisen erilaisiin ympäristöihin jotka vaikuttavat positiivisesti nuorten kehitykseen.

Väite 4. Rungas leikinomainen harjoittelu kokeiluvuosien aikana rakentaa perustuksen sisäiselle motivaatiolle monien aktiviteettien kautta ja tukee itsesääätelyä.

Väite 5. Rungas leikinomainen harjoittelu luo tarvittavia motorisia ja kognitiivisia kokemuksia jotka nuoret voivat tuoda lopulliseen päälajiinsa.

Väite 6. N. 13 vuotiaana lapsilla pitäisi olla mahdollisuus valita joko erikoistua heidän lempilajiinsa tai jatkaa urheilua harraste-tasolla

Väite 7. Myöhäiseen teini-ikään mennessä (n.16 vuotiaana) on kehittynyt tarpeelliset fyysiset, kognitiiviset, sosiaaliset, emotionaaliset ja motoriset taidot jotta he voivat aloittaa yhteen lajiin panostamisen. (Kuva 6)

#### Harjoittelumäärät

Tutkimuksiin perustuvassa näytössä sanotaan, osallistuminen enemmän kuin 8 kk vuodessa yhteen lajiin, liikunta yli 16 tuntia viikossa ja osallistuminen ohjattuun harjoitteluun enemmän tunteja viikossa kuin lapsen ikä on riski loukkaantumisille.

(Jayanthi & al 2012, 255; Myer & al 2015, 5; Bell & al 2016, Olsen & al 2006, Rose & al 2008 in Post & al 2017, 1405; Rose & al 2008 in Post & al 2017, 1045) huomasivat, että lapsilla jotka osallistuvat urheiluun yli kuin 8 kk vuodessa, oli 62%-90% suurempi todennäköisyys loukkaantua verrattuna lapsiin jotka urheilivat alle 8 kk vuodessa.

Aikaisemmat tutkimukset ovat osoittaneet selvän suhteen ohjatun urheilun määrällä ja loukkaantumisriskillä. Korkein riski oli urheilijoilla jotka harjoittelivat yli 16 tuntia viikossa.

Cóten mukaan suorituskykyyn keskittyvän harjoittelun ja leikkimäisen harjoittelun suhde pitäisi vaihdella uran aikana ottaen huomioon urheilijan iän. Urheilijoiden tavoitteet ja motivaatio vaihtelee eri ikävaiheiden aikana. Näiden kahden harjoittelutyyliä yhdistämällä on saatu parhaat tulokset. (Côte 1999 in Karell, 2016).

- Rohkaise nuoria kokeilemaan monia eri urheilulajeja mistä he pitävät ja voivat kehittää monipuoliset fyysiset ominaisuudet.
- Varmista, että nuoret osallistuvat ohjattuun harjoitteluun sekä joustavampaan leikkisään harjoitteluun minkä he ovat itse organisoinut
- Suunnittele harjoittelu niin että se rakentaa positiivista itsekuvaa, oma-aloitteisuutta ja pätevyyden tunnetta.
- Pidä huolta, että harjoituksissa harjoitellaan perusliikuntataitoja (hyppiminen, loikkiminen, työntäminen, vetäminen, heittäminen, kiinniottaminen, ryömiminen, juokseminen ja kieriminen).
- Vähennä loppuunpalamisia, tylsyyttä ja dropoutteja välttämällä liian aikaista erikoistumista ja liiallista harjoittelua.
- Painota urheilun hauskuutta jotta nuoret luovat positiivisen kuvan urheilusta/kuntoilusta joka jatkuu koko elämän läpi.

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