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Scholarship Physical Education

"It is only through work and strife that either nation or individual moves onto greatness"- Theodore Roosevelt.

This view of becoming successful; that champions and "greatness" is acquired through hard work and grit, is a sports theory held widely across the world. This theory is a traditional value in our culture that will continue to impact the actions of sport administrators, coaches and athletes on their road to greatness. However there are more factors at play when becoming an elite athlete. As technology has advanced and developed so greatly in the past century it has become a crucial element of sport. When watching the Olympics it is clear as to which countries are wealthier, portrayed by the more sophisticated and advanced equipment used. This makes me wonder, is it ethical that wealthier nations and richer teams can afford to utilise technology in sport more than their poorer competitors? As we have seen advancements in technology within sports we have seen advancements in sporting accomplishment, or is it simply that athletes are working harder? How much of an impact do genes have in sport? Who is profiting off and promoting the sporting assumptions widely held in society? Is there a 'magic bullet', a single stand-alone reason to explain an elite athlete's sporting accomplishments and expertise?

1. "Hard work beats talent when talent doesn't work hard"-Tim Notke

Is pure hard work directly proportional to an athlete's success? From a young age this assumption has been portrayed and embedded in us. It is a traditional and prevalent assumption embedded within our society. Tim Notke, a sports psychologist, stated that "hard work beats talent when talent doesn't work hard" this belief suggests that all that is required to become an elite athlete is hard work.

The New Zealand Rugby Sevens team coach of the past 22 years, Gordon Tietjens, was notorious for working the Sevens team to their optimum fitness level during trainings. Former Captain Eric Rush stating that "he would push your body so hard that it would become counterproductive but that's when the mental conditioning comes in"¹. Tietjens did this for that reason, to build mental toughness and install an ideology in his players to work hard, harder than what your body is capable of. This training method was successful, resulting in New Zealand winning many Rugby Sevens tournaments and bringing home gold medals in four consecutive Commonwealth games². Eric Rush said that his tough training and the mental toughness that he embedded into his players was the "secret to his teams. It's not rocket science"³. Tietjens is now an elderly man who has grown up with fitness as one of his greatest values in life⁴. It is conceivable that due to his age he is less inclined to implement scientism into his training regime thus his adoption of the traditional approach to hard work. Juvenoia is a sociological theory that explains the natural 'fear' of the newest generation. Consider how many times you have heard an old person complain about how "things were back in my day..". This occurs due to primitive psychology ingrained into us⁵. The older generations are by definition reproductively successful in carrying on the species thus when comparing their generation to the new they prefer the way they were raised. The same is applied to Tietjens' sporting style, it has always worked, so why change? Many people critique Tietjens' training style as being out of touch. However these chronological snobs ignore the fact that he is arguably the greatest coach to ever grace the game of Sevens. Furthermore the installation of mental toughness and a strong mental psyche has proven to split elite athletes from just athletes in all sporting disciplines.

¹ Retrieved from <<http://www.stuff.co.nz/sport/10311162/The-transformation-of-coach-Gordon-Tietjens>>

² Retrieved from <http://ur7s.com/match-archive?team_a=New+Zealand&team_b=&series=HSBC+World+Sevens+Series&season=&country>New+Zealand&tournament=&submit=Search>

³ Retrieved from <<http://www.stuff.co.nz/sport/10311162/The-transformation-of-coach-Gordon-Tietjens>>

⁴ Retrieved from <<http://www.stuff.co.nz/sport/opinion/8256548/Death-drill-breathes-life-into-Titchs-teams>>

⁵ Retrieved from <https://www.youtube.com/watch?v=L00x7ho_IYc>

Matthew Syed, a former English badminton Commonwealth champion, described the importance of mental toughness, stating, "a key factor of driving success and failure is to be found within the realm of motivation"⁶. This motivation is what allows elite athletes to perform at the best of their ability. An analysis of any elite athlete will show that their motivation and grit is phenomenal. Adopting the football pitch as his new home, a young David Beckham would routinely kick a ball from the same spot every day. Beckham's father said that "his dedication was breath-taking"⁷. This is just one example of 1000's portraying the extent of grit and mental toughness that elite athletes have enforced into their psyche through hours of gruelling training. Being motivated and determined to never give up is what separates the elite from a normal person. Having this mentality will allow athletes to build up the experience and hours required to become elite without giving up.

Seeing the success the NZ Sevens team has on an international level reinforces the traditional belief in young people and their coaches that they have to endure a lot of hard work to become successful. This in turn encourages young people to push themselves further and their coaches to push young people to work harder. Coaches and sporting administrators across the globe are beginning to focus purely on hard work and the attainment of hours spent training. This theory is detailed in Malcolm Gladwell's book, Outliers, in which Gladwell explains the direct correlation between hours spent practicing in a specific discipline and an individual's success in this specific discipline. Gladwell declared in his book that "ten thousand hours is the magic number of greatness"⁸. Therefore if you work hard for 10,000 hours in a specific discipline then you should become successful.

This theory was fathered by K. Anders Ericsson whilst studying what differentiates the good, great and elite violinists. What Ericsson found was time spent practicing directly correlated to the success of the violinist "there is a complete correspondence between the skill level and their average

⁶ Syed, M., Bounce, 2010 p.108

⁷ Syed. M., Bounce, 2010 p. 57

⁸ Gladwell. M., Outliers, 2008 p. 40

accumulation of practice time alone". He found that on average the elite violinists had spent 10,000 hours of purposeful hard work. The theory states that it is 10,000 hours of deliberate practice to become an expert.

Deliberate practice is best defined by Jean Cote as "highly structured activity that requires effort, generates no immediate rewards, and is motivated by the goal of improving performance rather than inherent enjoyment"⁹. Ericsson then went on to apply this rule for anything especially sport. This theory has become so passively absorbed and accepted by the general public and sport institutes like the Australian institute of sport, who are budgeting exactly 10,000 hours of training by the age of 18 in hopes of producing elite athletes¹⁰.

An example of the 10,000 hour rule producing an elite athlete is New Zealand's very own child golf star Lydia Ko, who at the age of 17 became the youngest ever golfer to be ranked number one¹¹. When Ko shot to fame in 2012 for becoming the youngest amateur to ever win a professional tournament I remember most headlines concluding the reason for her record breaking success to be due to her natural talent or that she was born to be a golf player. In reality Lydia Ko's parents took a five year old Lydia Ko into Guy Wilson's Golf shop requesting her to receive training. Since then Lydia has spent on average 35 hours of training a week¹², even spending nights on the golf course in the dark with her father looking on with night vision goggles¹³. Ko's coach early on, Guy Wilson, explained to TVNZ Close Up that parenting is not responsible for Ko's early success, instead he explains that it is her mental toughness and her passion for the game that is responsible for her success. This combined with her hard work put into building up 10,000 hours has allowed her to become an elite athlete at a very young age whilst appearing as though she was gifted the ability to play golf due to the fact her hours of experience and hard work were done at a young age.

⁹ Retrieved from <<http://www.ryascotland.org.uk/SiteCollectionDocuments/Instructor%20and%20Coach%20Education/CoteBakerAbernethyHandbook.pdf>>

¹⁰ Epstein. M., The sports gene, 2013

¹¹ Retrieved from <<http://www.lpga.com/news/nc15-ko-17-and-no-1-parker>>

¹² Retrieved from <<http://www.stuff.co.nz/sport/golf/63480354/All-you-need-to-know-about-Kiwi-golfer-Lydia-Ko>>

¹³ Retrieved from <<http://www.espn.com/espnw/news-commentary/article/12914865/to-understand-lydia-ko-aslounding-ascension-look-new-zealand>>

The training style used by Guy Wilson in training Lydia Ko is significantly less authoritarian and physically draining as that of Tietjens. The authoritarian training style used by Tietjens can equate to the fun and enjoyment being taken out of the physical activity especially if adopted for younger people. In Sports NZ young person's survey, the main reason young people participate in physical activity is because it is fun. The same survey also showed that the main cause of drop offs in physical activity is due to it becoming too competitive. A reason for physical activity being competitive to the point that it is causing a decrease in youth participation is due to the belief ingrained in our society that pure hard work gets results. It is a belief that is so ingrained due to the fact there are powerful organisations and bodies promoting this ideology.

The assumption purely hard work is directly proportional to an athlete's success is promoted and pushed by the media, corporate bodies and athletes themselves. Many athletes claim hard work to be solely responsible for their success as it is easier to believe that you have earned your success through hours and hours of hard work as opposed to acknowledging other factors. The Tim Notke quote has recently had some media attention due to the NBA 2013-2014 MVP, Kevin Durant quoting it during a press conference. Growing up Kevin Durant would practice basketball and be doing a range of physical activity eight hours a day¹⁴. Kevin Durant's success can be related to the 10,000 hour rule. By the time Kevin Durant was drafted by the Seattle Supersonics he had put in a lot of hours of basketball. Those hours courtesy of his mother Wanda. At the age of 10 Kevin told his mother that he wanted to become a NBA star so she brought it upon herself to get him there by pushing him to perform at his physical best. In 2013 Kevin Durant shared with 60 minutes "at times I resented her for it...I remember one morning she woke me up at two in the morning to do 100 press ups"¹⁵. From age 11 Wanda and Kevin's coach at the time, Taras Brown set up a strict training regime up until he went to high school. A simple look at Kevin Durant's achievements

¹⁴ Retrieved from <<http://herecomeskd.weebly.com/childhood.html>>

¹⁵ Retrieved from <<https://www.youtube.com/watch?v=vOaBA9CqS-k>>

would suggest that Kevin Durant has shown the 10,000 rule was successful in producing his success in the NBA.

The reason that the media and corporate entities such as Nike and Adidas promote the 10,000 hour rule is due to making a large profit off of an already existing belief. The 10,000 hour rule helps to reinforce consumerism and society's materialistic nature. If people believe that all they need to do is work hard to become an elite athlete then people will do so. In doing so people will buy products from brands like Nike and Adidas who use the media to instil a belief that the equipment they sell will help you work harder for longer. In order to increase participation in physical activity the media reinforces the ideology that anybody can become an elite athlete through working hard, this in turn will allow participation in physical activity to continue growing thus consumers consuming the corporation's products. The media profits off of this through advertising revenue, books, movies and television. Think about how many Hollywood classics emphasize the strength of the human spirit and grit. Athletes themselves earn money in sponsorship contracts. This trio is incredibly powerful in manipulating the masses, however not responsible for the widely held belief that working hard directly correlates to becoming an elite athlete. The belief is just further reinforced in us as a people. The reinforcement theory, an audience theory developed in the 1960's suggests that media is a very powerful tool in reinforcing already existing emotions, values and beliefs held by the audience. This hard work belief is already ingrained in us due to our capitalist society. It is easier to accept socio economic problems in society if we believe that the majority of people in less fortunate circumstances is due to them not working as hard. We often hear people tell those in less fortunate circumstances "they should just work harder" or that "if you work hard then you will get far in life", these mantras are due to our history as a British colony and our capitalist culture. In an ideal world the amount of hard work or hours of hard work would directly correspond to the level that an individual is rewarded. We see many examples of this not being the case in New Zealand with the number of the 'working poor' growing significantly¹⁶. The same is applied to sport. There are many

¹⁶ Retrieved from <<http://www.stuff.co.nz/national/81788403/The-struggle-to-balance-budgets-for-todays-working-poor>>

factors and unforeseen elements in the making of an elite athlete and it is not as simple as a magic number of hours spent purposely training.

There are many factors not accounted for by the 10,000 hour rule that Gladwell has chosen to ignore. Remember that Ericsson quote “there is a complete correspondence between the skill level and their average accumulation of practice time alone”, precisely the 10,000 hour rule is just an average. David Epstein, a sports psychologist effectively critiqued the 10,000 rule in his book, The Sports Gene. In an interview with Outside Magazine, Epstein explains that the rule is just an average “one person could put in 20,000 hours another 0, so there’s your 10,000 hours”.¹⁷ This is exemplified in his research comparing two high jump champions, Donald Thomas and Stefan Holm. Stefan Holm, a Swedish high jump champion had spent his entire life competing in high jump. From a very young age he was determined to become the greatest high jumper in the world. Holm achieved this goal after accumulating hours and hours of hard work. As opposed to Donald Thomas who at the age of 20 first tried high jump after a bet with his university mate. On Thomas's first high jump attempt he cleared 6"6' with ease. Thomas then progressed up to 7 foot and was able to clear a 7 foot jump with no prior experience in high jump. Two months later, Thomas finished 4th in the commonwealth games. After eight months of serious training Thomas competed in the 2007 high jump World Championship against Holm. Thomas was crowned the world champion high jumper, he had beaten Stefan Holm- a man who had spent his entire life high jumping was beaten by a man who has spent eight months training¹⁸.

As technology has advanced in the modern world, we now have the ability to investigate the effect of genetics in sport. In the book Epstein illustrates the importance of genetics; an aspect of an individual's success ignored by the 10,000 hour rule. An analysis of Thomas's body shows that he was born to jump. In 2008 Masaki Ishikawa a neuromuscular scientist examined Thomas's body. Ishikawa found that Thomas's legs were disproportionately larger than his body and he had an

¹⁷ Retrieved from <<http://www.outsideonline.com/1917731/how-athletes-get-great?page=all>>

¹⁸ Syed, M., Bounce (2010) p. 27-32

especially large achilles tendon. The longer and stiffer an achilles tendon means it can store more elastic potential energy when compressed, thus an increase in energy released in the system, therefore a higher jump. Thomas is not an "outlier" when it comes to his naturally gifted genes allowing him to perform as an elite athlete. The effect of genetics spans through every sporting discipline from Valerie Adams who comes from a family in which the girls average a height of six foot¹⁹ to Sonny Liston's arm span being one foot larger than his height²⁰.

The justification of an athlete's success is not as simple as just hard work or just a specific number; there are multiple other factors at play. Baker and Horton contend those factors can be broken down into primary and secondary factors. Primary factors are considered to include, genetics, how you train and your mental grit and psychology. The secondary factors established by Baker and Horton are socio-cultural, culture, training, resources and your family support. Kevin Durant has had each of these individual factors combine to produce his athletic stardom. Basketball is a physical sport meaning any physical advantage you have over your opponents is a very strong advantage. The effect of this is it is now a league in which being born with the right genetics helps greatly. The NBA draft combine allows NBA coaches to analyse the physique future draft picks. It also allows statisticians to analyse the development of the league. In 1983 NBA players became entitled to ticket revenue and a share of television contracts due to signing of an agreement in which they became partners in the league²¹. Basic economics shows that there was now a much larger incentive to become a NBA player. Taller people with a physical dominance could now capitalise off of their natural gifts and become a basketball player. David Epstein contends that the effect of the NBA signing this agreement was "almost overnight the proportion of players in the NBA who were over 7' doubled to 10%"²², highlighting the importance of genetics in the NBA. Furthermore in the history of the NBA there has never been an athlete who wasn't tall enough to touch the basketball

¹⁹ Retrieved from <<http://heavy.com/sports/2016/08/valerie-adams-family-picture-brother-steven-nba-thunder-siblings-how-many-brothers-sisters-mom-dad-husband-bio/>>

²⁰ Retrieved from <<http://www.si.com/vault/2012/11/05/106252287/the-case-for-wingspan>>

²¹ Retrieved from <<http://digitalcommons.lmu.edu/cgi/viewcontent.cgi?article=1096&context=elr>>

²² Retrieved from <https://www.ted.com/talks/david_epstein_are_athletes_really_getting_faster_better_stronger?language=en#t-362157>

rim at the draft combine²³. Kevin Durant is 2.06 m tall with an arm span of 2.26 m²⁴. According to a study done by the University of Massachusetts Med School the average American man has an arm span larger than his height by 5.1 cm.²⁵ Kevin Durant's notoriously large arm span allows him to defend better as he can reach much higher, dribble with more control and attack the basket with less contest. In addition to this Kevin Durant has the mental grit displayed in all elite athletes shown by his will to continue despite his mother's harsh and gruelling training style mentioned previously.

A crucial aspect responsible for Kevin Durant's basketball prowess is the cultural importance of basketball in the United States. The United States of America is by far the biggest watchers, participants and supporters of basketball in the world. They have more professional basketball players than any other country thus more endorsements and more brand sponsorships displayed throughout the media. Basketball is the most popular sport amongst youth in America as shown in the survey of American youth conducted by Don Sabo a college professor at D'youville College²⁶. Not only is basketball an important aspect of American culture it is highly valued by the African American community. African Americans make up only 13% of the USA's population however make up 80% of professional basketball team rosters²⁷. There is also an overrepresentation of African Americans in awards and accolades received by athletes. Growing up Kevin Durant had clear African American role models. Growing up in an impoverished black neighbourhood basketball was very hard to escape. It is common for poorer black neighbourhoods to value basketball very greatly as it is seen as a 'way out of the hood'. Cultural capital is any skill sets, knowledge or non-financial assets in which give you a higher status in society. Placing a high cultural capital on sport is an element of an elite athlete's success. In poorer black communities being a skilled basketball player will give you a lot of 'street cred'. This is one of many factors attributed to Kevin Durant's success. In New Zealand the same could be said for young Pasifika

²³ Epstein, D., (2013) p. 134 Sports gene

²⁴ Retrieved from <http://www.slate.com/articles/sports/sports_nut/2014/05/nba_wingspans_forget_height_basketball_players_wingspans_are_absurd_and.html>

²⁵ Retrieved from <<http://www.aafp.org/afp/2008/0901/p597.html>>

²⁶ Retrieved from <http://www.espn.com/espn/story/_/id/9469252/hidden-demographics-youth-sports-espn-magazine>

²⁷ By David A. Karp, Gregory P. Stone, William C. Yoels, Nicholas P. Dempsey Being Urban a Sociology of city Life, 3rd edition p.243

and Maori males and their rugby league ability. In Sport NZ's survey of over 17,000 young people in New Zealand they found that young Pacifica and Maori boys are more likely to play and watch rugby league. Thus, valuing an individual's ability to play rugby league higher than other demographics. This is a reason why participation in rugby league is higher amongst young boys and an over representation of Pacifica and Maori in the NRL²⁸.

Another reason the 10,000 hour rule is so passively accepted as an ideology is because it appeals to the lowest common denominator. Not only does the idea that all athletes are in their position of success due to their outstanding hard work appeal to society's capitalist nature but it is also a very 'politically correct' viewpoint. "Anyone can do it if you work hard"-how many times do you remember hearing that as a child. If we tell our children "honey if you want to become successful and famous like your favourite player Kevin Durant then you need a perfect combination of genetics, cultural capital, training resources and many other external and internal factors" then a huge decrease in motivation and desire to participate in physical activity would occur. Hence why the 10,000 hour rule is so strongly reinforced by 'the trio'.

The success of Syed's book, Bounce, can also be attributed to this as he is telling society what society wants to hear. In Syed's promotion video for his book Syed tells the viewer "now you're going to say you need both opportunity and talent. But that's not what the science is saying"²⁹. The truth is that's not what the science is saying if you choose which scientific data and reports to look at. From reading Syed's book, Bounce, personally it becomes apparent that he is cherry picking data that suits his argument. For example Syed refers to the game of chess to back up his argument that the 10,000 hour rule is a concrete rule if you work hard, referring to a study done by psychologists Herbert Simon and William Chase³⁰. In reality a study commenced by the psychologists Guillermo Campitelli and Fernand Gobet showed that there was a significant variation

²⁸ Retrieved from <<http://www.teara.govt.nz/en/rugby-league/page-4>>

²⁹ Retrieved from <https://www.youtube.com/watch?v=l1K6bOG8mj8>

³⁰ Syed, M., Bounce (2010) p. 15, 23-5

in time spent practicing chess and the level of success. 3000 hours was the amount of time spent for one player to become a master as opposed to another player who needed 23,000 hours. Showing again that the 10,000 hour rule is no 'magic bullet' instead just a number.

It's not up for debate, elite athletes do work very hard, there's just no 'magic bullet' when it comes to the birth of an elite athlete's success.

The 10,000 hour rule is just a number fuelled by the capitalist nature of society in which hard work is believed to be the answer to success. As much as the powerful trio would like you to believe hard work alone will not directly correlate to an individual's success. Hard work alone is not a 'magic bullet' especially in the modern era. The standard for becoming an elite athlete has increased immensely considering the level of development in records. For example the winner of the 2016 Olympic marathon, Eliud Kipchoge, ran the marathon in 2:08 hours compared to the winner of the 1908 Olympic marathon who won with a time of 3:28. Or prior to Sir Roger Barristor we thought that running a mile in under 4 minutes was impossible. Nowadays most professional runners can do this and even some college students. Matthew Syed has determined this development in sporting achievements to be due to athletes working harder "They must have occurred because people are practicing longer, harder and smarter". Yet again he is feeding into society's ingrained and traditional belief surrounding hard work. There is a strong relationship between records being broken and a new advancement in sporting technology. For example, in 1976 when gutters in the side of the Olympic swimming pool were first introduced resulting in 12 of 13 male world records being beaten and 9 of 13 female world records. Clearly the effect of technology is paramount. What about those who can't afford the technology. There are many factors for the birth of an athlete's stardom. Although it is essential that athletes work hard to become the best that they can, hard work is not solely responsible.

1.1 The Culture surrounding hard work

An individual's culture and their culture's value is a significant aspect when analysing the causes of an athlete's success. Different cultures obviously have different opinions on the level of hard work and how it is implemented into training athletes. As mentioned previously working children too hard can cause a decrease in participation. Although this is a complex issue, consideration needs to be given to our culture in New Zealand when analysing the reason why. What if there is a strong cultural capital centred around the success of your child in physical activity? Eastern culture is heavily centred on working hard for many long hours. This is displayed in China, who value working extremely hard from a young age to gain not only sporting success but success in general. The average Chinese high school student studies from 7 am - 11 pm³¹. The same gruelling approach is applied to sport. The Chinese sports system is very rigorous, the ideology that success will be achieved through hours on end of hard work from a young age is heavily enforced. As of 2010 there are 80,617 professional athletes in China, two thirds of which are children. There are an additional 400,000 children trained in sports schools throughout the country³². The teaching and training styles in China is very strict and consists of rigorous hard work with many hours of training built up. For up to ten hours a day children as young as four are stretched to their physical limit in order to produce Chinese Olympians³³. The headmaster of the Chen Jinglun sports school explains to critics that "without hard work no gain...it requires sweat and blood to become outstanding". The result of China's sport system is the Chinese Olympic team has consistently been very successful at the Olympics ranking in the top three medal counts since 1996.

The reason for China's strict and what would appear to be extreme training styles is to try and dominate at the Olympics. By displaying a country with sporting prowess they appear strong and mighty. To understand the reason why China want to dominate the Olympics we first must

³¹ Retrieved from <http://hechingered.org/content/a-day-in-the-life-of-chinese-students_3826/>

³² Hong, F., (2010) Innocence lost: Child athletes in China

³³ Retrieved from <<http://www.itv.com/news/2016-08-03/inside-chinas-sports-schools-where-the-next-generation-of-olympians-are-made/>>

understand the culture and political history of China. The Chinese communist party rose to power after defeating the Nationalists in 1949. The party implemented an authoritarian communist government in which everything including sports was controlled by the government. The world has historically seen examples of authoritarian states using sport as a means of foreign policy in the fascist states Italy and Nazi Germany and also in the communist states of Eastern Germany and Soviet Russia. In return, the USA responded to this by representing the "free world" and democracy³⁴. The effect of this is that these countries dominated the early modern Olympics. There was also a significant development in Olympic results and performance due to each country's desire to demonstrate the strength of their political ideology³⁵.

Deliberate practice is best described by Cote; "highly structured activity that requires effort, generates no immediate rewards, and is motivated by the goal of improving performance rather than inherent enjoyment"³⁶. We see this theory adapted by most professional sports teams and in countries whose culture is very centred around hard work like China. China adopted this in order to find the best athletes to show the world how powerful their nation is. By having a highly structured and regimented training programme from a young age allows the individual to receive feedback and knowledge from a coach and in turn improve on this through repetition. Deliberate practice is explicitly set out to improve an athlete's ability however it not immediately entertaining and the enjoyment out of sport can be lost. Ericsson's study of violinists showed that deliberate practice was rated very high on relevance for performance, high on effort and was low on inherent enjoyment.

The Chinese sport system is specialising young children very early in specific sports through regimented deliberate practice. Rasmus Ankersen highlighted that these children who specialise early will continue to build up the experience and the hours required to become elite whilst other

³⁴ Arnaud, P., (2003) Sport and International Politics: the impact of fascism and communism on sport

³⁵ Arnaud, P., (2003) Sport and International Politics: the impact of fascism and communism on sport

³⁶ Cote J., Baker J., Abernathy B., (2007)The Role of Practice and Play in the Development of Sport Expertise

children will be playing catch up. As mentioned previously the New Zealand golf child star Lydia Ko is an example of early specialisation. By only focussing on golf she became the youngest ever world number one. "I'm not good at any other sport" Lydia explains to journalists. This is due to golf being her exclusive focus in sport³⁷. However there are negative repercussions to early specialisation if not executed well like Lydia Ko's coach Guy Wilson who put emphasis on keeping Lydia motivated and cared for her health³⁸.

Similar to how poorer black communities view basketball as a way out of the hood, poorer rural families in China send their children off to sport schools in hopes of their child becoming successful and contributing to the nation's might. However the cost of this powerful international image is quite detrimental to the children in those sporting schools. Critics like Fan Hong believe that children in the Chinese sports system are robbed of their innocence; they do not get the opportunity to be children instead have to endure military like training to get a shot at international success. Furthermore those children who fail in their chosen sporting discipline due to injury are left with no education and no understanding of the world surrounding them outside of sport. Zhang Shangwu is a 32 year old former Chinese Gymnast who spent his childhood in a sport school destined for Olympic stardom who in 2002, at the age of 18 tore his achilles tendon during training. Due to this injury Zhang Shangwu could no longer be an elite athlete instead, abandoned by the state with no support or education, he turned to stealing jewellery to make a living. He describes the transition from an elite athlete to a homeless thief as "like an animal being released back into the wild"³⁹. There are thousands of examples of the Chinese government abandoning their child sporting stars leaving them with little to no education and poor mental and physical health.

The Chinese sporting system focuses solely on the assumption of hard work and early specialisation. The outcome of this exclusive mindset is other aspects of an individual's well being

³⁷ Retrieved from <[http://www.stuff.co.nz/sport/golf/78605653/Olympicsbound-golf-star-lydia-ko-claims-she's-hopeless-at-other-sports](http://www.stuff.co.nz/sport/golf/78605653/Olympics-bound-golf-star-lydia-ko-claims-she-s-hopeless-at-other-sports)>

³⁸ Retrieved from <<http://www.espn.com/espnw/news-commentary/article/12914865/to-understand-lydia-ko-s-astounding-ascension-look-new-zealand>>

³⁹ Retrieved from <<http://www.itv.com/news/2016-08-03/inside-chinas-sports-schools-where-the-next-generation-of-olympians-are-made/>>

are ignored. The children in the Chinese sport school are viewed by the government as a commodity, a means of portraying a powerful nation as opposed to viewing them as an individual. A New Zealand model of Wellbeing is the concept of Te Whare Tapa Whā, commonly referred to as Hauora. This Maori health philosophy comprises of four dimensions taha tinana, taha hinengaro, taha whanau, and taha wairua (physical well-being, mental and emotional well-being, social well-being and spiritual well-being). By focusing on pure hard work and specialising children at such a young age the Chinese sport system ignores the other dimensions to an individual's identity. Taha whanau directly translates to family health. A lot of the children in the sports schools are sent from rural villages and rarely get to see their Whanau. A diver from the Hubei sport school told Time magazine that she sees her parents about once a year⁴⁰. The Hauora philosophy states that whanau provides us with the strength to be who we are. The Chinese sport schools ignore this aspect of the child's health. The children's taha hinengaro is also alarmingly impaired in the Chinese sporting schools. Taha hinengaro is the idea that thoughts, feelings and emotions are fundamental components of one's soul. An athlete cannot function without a strong mental health. Fan Hong a critic of the Chinese sport schools illustrated in her report *Innocence Lost: child athletes, children in Chinese sport schools have their innocence stripped and the effect of being worked so hard at such a young age has detrimental impacts on their mental health.* Children are worked to the extreme for one clear outcome: Olympic success. The schools will work the children for this outcome ignoring their emotions, thoughts and feelings. If the Chinese children do not acquire this success it is as if their life was pointless leaving them with poor taha hinengaro. The children's identity becomes prescribed by the school. This takes the control away from the individual by reducing their autonomy. The child athletes have little control over their direction and goals due to the early specialisation and extreme hard work endured. This results in their spirituality or Taha wairua being damaged. Self-determination theory is a theory on human motivation; it is fuelled by internal motivation and internalized motivation is important for the well-being and psychological health of an individual. The Chinese sport system, through using early specialisation

⁴⁰ Retrieved from <<http://time.com/4442329/china-diving-rio-2016-Olympics/>>

decide the individual's goals for them. Taha wairua states that our individuality is determined by our spiritual health. The Chinese sport system is damaging to all aspects of the child's hauora. Although the Chinese sport school is an extreme example of how early specialisation can impair a child's hauora it is still reflective on the theory itself. Furthermore early specialisation and deliberate practice result in decreased participation especially in New Zealand in which our culture is not as focused around hard work as in eastern countries like China, Korea or Japan. In New Zealand it will be hard to find circumstances comparable to that of the military styled sports schools however personally I do understand the effect of a coach believing that absolute hard work produces the best results. At the age of 13 I was selected to play in the Horowhenua representative football team. Our coach was very focused on deliberate practice and working hard. As a result the entire team (bar his son) strongly disliked the coach and we were unsuccessful. Sport NZ in their Balance is Better report said the most likely outcomes of early specialisation is burn-out, overuse injuries and declining motivation⁴¹. In the 2011 young people survey conducted by Sport NZ of over 17,000 young people in New Zealand aged between 5-18 found that the main reasons for dropping out of sport were; loss of the social element, too competitive, injury, other responsibilities and taking up non-active activity like gaming. Overuse injury occurs when specialising early due to the fact that the child is using the same joints and muscles repetitively as they are focusing on a specific sport. By training or playing a range of sport the child is conditioning muscles throughout the body resulting in a more conditioned overall body.

As early specialisation can be detrimental to a young athlete's success leading to burnout, injury and lack of motivation Sport NZ has focused on deliberate play and late specialisation. Deliberate practice is defined by Cote as "physical activity that is intrinsically motivating, provide immediate gratification and are specifically designed to maximise enjoyment". This is often seen in New Zealand, for example growing up I spent a lot of time playing football, rugby, cricket and many other physical activities in a cul-de-sac at the end of the street. Cote recognised that athletes tend to first

⁴¹ Retrieved from <<http://www.sportnz.org.nz/assets/Uploads/SportNZ-BalancelsBetter-v01.pdf>>

experience physical activity through fun and enjoyment as opposed to being forced to play it⁴². Sport NZ have chosen to implement deliberate play amongst young people in New Zealand to imbed physical literacy within society in which physical activity is entertaining and groups and organisations take a more holistic approach, considering all dimensions of an individual's Hauora⁴³. In doing so young people will be more motivated to participate in physical activity as there will be immediate rewards and their well-being is cared for. Also it is more encouraging to portray the message in society that you do not have to have been training like a professional athlete at the age of six years old like Andre Agassi who hit 1 million tennis balls a year at the age six. Children and parents who believe this assumption will be less inclined to participate in physical activity as they will believe it is too late to start. Studies have shown that children will spend more time playing than they will deliberately practicing. This is due to the children wanting to participate due to their own internalised motivation as opposed to external factors like winning awards⁴⁴. This internalised motivation will result in a stronger taha wairua as the motivation is self-determined and driven by the individual. All Black super star Dan Carter explained that "all the rugby I played competitively as a kid, it was dwarfed by the hours I spent playing with my mates. That's what I put my skill set down to." Through the hours in the park with Dan's mates playing a range of different rugby like games he was able to acquire a ranged skill set and also was able to play hours and hours of rugby thus gaining experience. Eliza McCartney is a 19 year old pole vault bronze medallist at the Rio 2016 Olympic games. Eliza first started pole vaulting at the age of 13. Prior to this she participated in a range of athletics and sport such as netball and high jump⁴⁵. Since her success it was rare to see her not appear in a news story at least once a week. Sport NZ is commodifying her as a means of promoting physical literacy and deliberate play. In doing so, they hope to increase the number of physical activity participation.

⁴² Cote J., Baker J., Abernathy B., (2007)The Role of Practice and Play in the Development of Sport Expertise

⁴³ Retrieved from <<http://www.sportnz.org.nz/assets/Uploads/attachments/About-us/2015-PhysicalLiteracyDocument-Online.pdf>>

⁴⁴ Cote J., Baker J., Abernathy B., (2007)The Role of Practice and Play in the Development of Sport Expertise p.143

⁴⁵ Retrieved from <http://www.nzherald.co.nz/sport/news/article.cfm?c_id=4&objectid=11699294>

Pellegrini and Smith proposed that through deliberate play a child can become more flexible and more creative as they are playing a range of sports and in doing so acquiring a ranged skill set. In team sports this skill set is especially important⁴⁶. Deliberate play was shown to build this creativity and better decision making ability through the study commenced by Berry and Abernethy in which they compared the backgrounds of expert decision makers in Aussie rules with non-expert decision makers. They found that those who were experts had spent more time playing a range of sport as opposed to deliberate practice⁴⁷. When training in strict regimented deliberate practice the child is being told what to do, they are obeying rules. On the contrary a child playing a game against friends is forced to make decisions by themselves. This freedom to make mistakes and then be forced to problem solve is the reason why children who grow up playing sports grow up to become better decision makers in sport.

The overwhelming success of the Icelandic football team at Euro 2016 and the failure of England is an example of early vs late specialisation. England Football is the richest football association and are very focused on early specialisation with the best clubs scouting young skilful footballers and putting them in elite athlete like training academies. The youth system in the UK works around the assumption of early specialisation and hard work similar to the Chinese sport system. The motive in scouting youth to join club academies is to make a profit out of them. Much like the Chinese sport system these children are seen as a commodity or an instrument in earning profit. To summarise football writer Anton Ingi Sveinbjornsson's insight into the reasons why Iceland was so successful despite their population being 0.61% the size of England's, it is due to the freedom that Iceland have given to the children to play football. The government had invested a great amount in building football fields throughout Iceland to allow children to be free to play football for the enjoyment of the game. This allows children from any socio-economic status to play football and enjoy the game. This focus on enjoyment and participation as opposed to focusing on the end product, an elite

⁴⁶ Cole J., Baker J., Abernathy B., (2007)The Role of Practice and Play in the Development of Sport Expertise

⁴⁷ Cole J., Baker J., Abernathy B., (2007) The Role of Practice and Play in the Development of Sport Expertise

athlete, resulted in the success of the Icelandic football team. The Icelandic culture is responsible for this holistic approach portrayed by their education system in which there is an emphasis on freedom and encouragement to allow the child to make decisions for themselves⁴⁸. The effect of encouraging deliberate play and enabling children to play football for hours on end due to abundance of fields was exemplified in the Icelandic football team's great success at Euro 2016.

It can be speculated that early specialisation is also promoted by 'the trio'. Corporate entities profit off of this assumption, the media profits off of this assumption and so to do the athletes. This is due to the millions of dollars made in profit due to training academies. Training academies like IMG training academy sell their expertise and training facilities for thousands of dollars under the assumption that specialising a child early and putting them through deliberate practice at their academies will create an elite athlete out of them. The standard charge for one semester alone is \$40,000 to attend the IMG⁴⁹ academy. The IMG Company was part of a \$2.2 billion dollar deal in 2014⁵⁰ showing how profitable training camps and academies are. Nike, Puma, Adidas, Lotto and all the other big name sport corporations also have training academies in a wide range of sports in order to profit off of the early specialisation myth that is so widely accepted in society. These training academies are then promoted by the athletes themselves who attended these academies and are sponsored by them. The media profit off of this through advertising revenue and promotion. All three of these powerful entities are dependent on one another's success in order to make a profit. The culture in Iceland allows children to be free and to play as opposed to in England where there is much more potential to earn profit off of the early specialisation assumption. The English culture reinforced by the trio has allowed for training camps to be widely accepted and every major football team like Manchester United have established youth teams with scouts searching for the most skilled children. As a colony of the British Empire, New Zealand has inherited this culture shown by

⁴⁸ Retrieved from

<https://books.google.co.nz/books?id=N_Y55_dn1dwC&q=PA164&pg=PA164&dq=education+in+iceland+freedom&source=bl&ots=U6SX7riuK3&siq=kirbyZC8ieVeYRqTYHmBX92lUpE&hl=en&sa=X&ved=0ahUKEwj52ZbVvv_PAhUDp5QKHQXkCu0Q6AEIVzAJ#v=onepage&q=education%20in%20iceland%20freedom&f=false>

⁴⁹ Retrieved from <<http://highschoolsports.mlive.com/news/article/-359863509795758801/img-academy-in-florida-too-good-an-opportunity-to-pass-up-for-lincoln-football-players/>>

⁵⁰ Retrieved from <<http://deadline.com/2014/05/wme-silver-lake-acquire-img-worldwide-654232/>>

the abundance of early specialisation camps throughout the country. The French philosopher, Pierre Bourdieu, first argued the idea that cultural habits and personality traits inherited from the family are crucial components of an individual's success. Furthermore Bourdieu develops this idea to say that any skill sets, knowledge or non-financial assets that give you a higher status in society are passed down through institutions of the state and every aspect of our society. Sport NZ through their promotion of physical literacy and deliberate play is trying to fabricate a cultural capital around having a ranged sporting skill set. The effect in doing so will result in an increase in participation and performance in sport. As described by Baker and Horton cultural support and importance will lead to higher ultimate performance. Nearly every young boy in New Zealand has woken up in the early hours of the morning to bacon, baked beans and eggs for breakfast to watch the All Blacks play rugby against a northern hemisphere team.

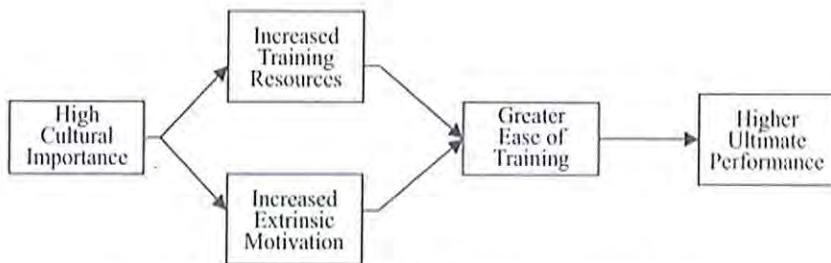


Figure 1. Example of the secondary effect of socio-cultural variables

Rugby is the most watched and widely celebrated sport in New Zealand. The All Blacks are the most successful rugby team in the world despite the small population of our nation. This is due to our high cultural capital held on being a skilled rugby player. The strength of rugby's cultural importance in New Zealand is epitomized in high school in which it appears as if the rugby jocks are inherently the most glorious and popular boys in the school. The high cultural capital on rugby has resulted in the All Blacks gaining much more media attention than any other sports team in New Zealand with more sponsors, more funding and more promotion resulting in more spending potential than any other sport team in New Zealand. Thus more training facilities and increase in opportunity as an increase in income results in an increase in opportunity. This in turn results in a high participation rate as there are more opportunities in New Zealand and it is more publicised. 65.6%

of young boys in New Zealand participated in a game of rugby in 2011⁵¹. Compare this to in England, the birthplace of rugby, in which 279,100 or 0.53% of their population participated in rugby⁵². Therefore the cultural importance of rugby in New Zealand has allowed New Zealand to have a large pool of athletes to choose from.

Koreans on the LPGA tour have exponentially increased in numbers from one in 1998 to 33 in 2007. In 1998, 21 year old Se Ri Pak won the McDonald's LPGA championships igniting a sense of patriotism and pride amongst Koreans. This encouraged young Korean girls to play golf. Before Se Ri Pak no Korean born women had ever won a LPGA championship or Women's Open. After Se Ri Pak's win in 1998 five Korean women have won a LPGA and seven have won an Open. Lydia Ko was aged one when her parents watched Se Ri Pak during her extremely successful year in 1998. This inspired Ko's parents to encourage her to play golf to become just like Se Ri Pak⁵³. This shows how technology has enabled cultural capital to spread much easier . People like Lydia Ko's parents can use the media to become inspired by sporting success stories or young boys in New Zealand can watch their All Black heroes win a world cup in turn reinforcing or instigating a cultural capital.

Deliberate play requires minimal equipment, organisation and can be initiated with ease. For this reason it is easier for children from poorer backgrounds to do physical activity through deliberate play. Brazil's cultural capital around football is historically and culturally deep, it is considered Brazil's second religion. Brazil is arguably the most successful football nation with 70% of all FIFA player of the year awards being awarded to Brazilians. Football is one of the only ways out of poverty in Brazil. The repercussion of this is 90% of Brazilian current footballers grew up in poverty. This is due to the combination of hours of experience acquired through deliberate play and the

⁵¹ Retrieved from <<http://www.srknowledge.org.nz/wp-content/uploads/2013/10/YP5-Complete-5-09-2012.pdf>>

⁵² Retrieved from <<https://www.statista.com/statistics/490314/rugby-union-participation-uk/>>

⁵³ Retrieved from <<http://www.golfdigest.com/story/lpga-hall-of-famer-se-ri-pak-announces-her-retirement>>

strong cultural capital. However football is very easy to instigate with very little equipment, for example Brazilian legend Pele famously practiced with a mango and rolled up socks.

Basketball requires more investment for people to participate in as a hoop cannot be created as easily as a football goal by putting two objects down. There is a very strong cultural capital amongst African Americans and basketball. Playing in the NBA is a serious goal amongst African American males especially those in poorer communities. Furthermore African American boys are more likely to say that playing in the NBA is their serious future job goal especially those in low income families⁵⁴. Historian Henry Louis Gates Jr quoted his grandfather on the depth of basketball in African American culture "If our people studied calculus like we do basketball we'd be running M.I.T". Despite poorer black communities being the demographic with the most prominent cultural capital placed on basketball they are 37% less likely to become an NBA player than a child raised in a middle or upper class family, for lower class white Americans the decreased likelihood of becoming an NBA player is 75%⁵⁵. This shows that the high cultural capital amongst lower class African Americans results in more becoming NBA players as opposed to lower class whites. However it also portrays the level of inequality in the NBA, a league portrayed as the way out of 'the hood', a league with the image that it consists of poor street kids fulfilling their dreams play basketball against the greatest basketballers in the world. The NBA was once a much more equal league with 90% of NBA players coming from urban areas in the 1960's and 1970's⁵⁶ however times have changed. The league has become more commercialised and popular with more corporate sponsors. Subsequently it requires more resources and technology to become an elite basketball player due to the increased competition. To quote Peter Roby, former director of the advocacy group Sport in Society and athletic director at Northeastern University "you need facilities, equipment and transportation" he goes on to say the result of this is "we've found kids in the cities

⁵⁴ By David A. Karp, Gregory P. Stone, William C. Yoels, Nicholas P. Dempsey Being Urban a Sociology of city Life, 3rd edition p.243

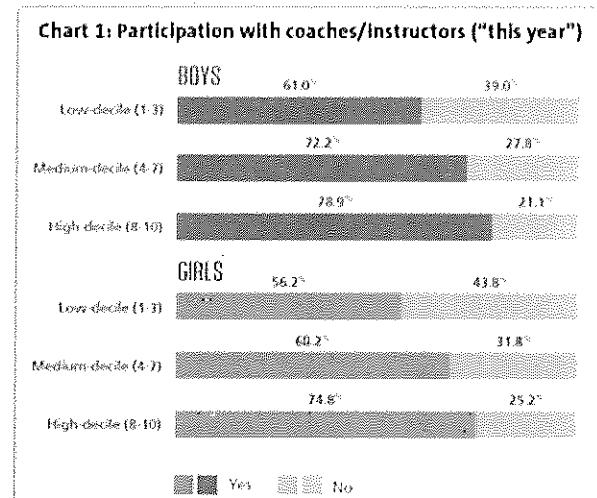
⁵⁵ Dubrow J. & Adams J., Hoop Inequalities: Race, Class and Family Structure Background and the Odds of Playing in the NBA

⁵⁶ Retrieved From

<https://www.researchgate.net/publication/254107241_Hoop_Inequalities_Race_Class_and_Family_Structure_Background_and_the_Odds_of_Playing_in_the_National_Basketball_Association>

are less likely to participate in sports than those in the suburbs". It is not only in basketball that there is a clear division between rich and poor participation in sport.

The graph is from a Sport NZ survey of young people studying the effects of different socioeconomic factors on sport. What is shown is participation with coaches' decreases as the average family income decreases. What was also shown in the report is enrolment in sporting clubs or college sport teams also decreases. The inequality in sport participation is great throughout all sport. In our society the wealthier you are the more opportunities you have. Children growing up in wealthier households will have increased opportunities to more advanced training resources, more advanced technology and better coaches. Furthermore the surroundings and environment in which a child grows up is important. Studies have shown that safer streets with less traffic have more child activity in which more children played a form of physical activity. There is a clear correlation between poverty and youth crime in New Zealand⁵⁷. A lower class neighbourhood is more likely to be more dangerous and less safe for a child to play out in the street. A PEW research centre survey in America showed that a child growing up in an impoverished community is less likely to spend time doing physical activity and spends more time at home when compared to a child living in a middle or upper class family⁵⁸. Clearly the level of involvement in sport is proportional to a person's income and this division is getting worse as technology becomes more prominent in sport.



Technology: how it's used in sport and the ethics surrounding it.

To critique the effectiveness and use of technology in sport we must first establish what technology in sport is. In 2008, 108 world swimming records were broken. What could possibly have been

⁵⁷ <https://www.victoria.ac.nz/news/2016/10/poverty-and-crime>

⁵⁸ <http://www.pewsocialtrends.org/2015/12/17/parenting-in-america/>

responsible for this staggering number of world records being broken? For the 2008 Olympics, Speedo worked with NASA to create the perfect swim suit; it allowed for better oxygen flow to the swimmer's muscles, holds the body in a more streamlined position and traps air to add buoyancy. The unfair advantage given to athletes using this suit led to the suit becoming banned. Clearly the effect of technology in sport is phenomenal and as technology is developing so rapidly governing bodies are finding it harder and harder to manage and regulate. There is a long history of technology becoming too advanced it becomes unfair: Graeme Obree made a bicycle at home with washing machine parts that was so aerodynamic and well-designed it was banned by the Union Cycliste Internationale, racquet dampeners in Tennis to reduce string movement by 50% were so effective they were banned, Polara ultimate straight golf balls-precisely placed dimples surround the ball to reduce side spin, Louisville Slugger Composite Baseball Bat- a bat made out of a carbon fibre polymer in which a batter can hit a pitch so hard the pitcher's safety is at risk leading to the NCAA banning the bat. The list of banned equipment is very long and getting longer as teams try to find the best equipment and technology in order to gain a competitive edge over the opposition. The richest countries in the world are in an 'arms race' to develop the best and most powerful sporting equipment.

Although governing bodies can ban equipment from being used in competition, richer countries can afford training facilities and equipment that poorer countries cannot. If it's unfair to compete using more advanced technology isn't it unfair to train with? Technocentricity is the scientific approach to enhancing performance in sport using innovative technology. Critics say that technocentricity can negatively impact an individual's hauora as it can lead to the athlete being viewed as a machine. Despite this it is proven to be very effective and produce outstanding results. Mounir Zok director of technology and innovation for team USA explains that "the success of an athlete depends totally on the type of information they can put their hands on". They get this information through very

advanced and expensive technology⁵⁹. For example USA Olympic hurdler, Lolo Jones, uses state of the art technology to analyse her movements down to millimetres and therefore through repetition can better herself as an athlete. Or the USA volleyball team who are using microchips to track their minute movements in training. The head coach of team USA volleyball Karch Kiraly said that this allows the team to train more intelligently whilst reducing the risk of injury⁶⁰. This advancement in training technology enabled team USA volleyball to achieve their greatest volleyball success at the 2016 Olympics. When you compare the amount of funding given to a team and the science that they implement into their trainings there is definitely a strong correlation. The New Zealand Olympic team has always punched above its weight bringing in an impressive medal tally despite the small size of our nation. This is one of few things that kiwis as a whole collectively brag about. In the 2016 Olympics New Zealand saw the largest medal tally in our Olympic history. A reason for this is more funding is being provided towards the teams allowing them to implement a more scientised approach to their training⁶¹. In High Performance Sport NZ media release they explained that they have programmes set up “which aims to enable a world class performance through break through in-house technology”⁶². This “breakthrough” technology included heat stress technology in order to stress the athletes for adaptation in the mens sprint cycling team⁶³. The result of this training was a silver medal, missing out on the gold by 0.102 seconds at Rio. Cyclist Sam Webster said that due to the advancement in technology in their training “We’ve been going out at a much faster pace than we’ve ever been able to do before in training”⁶⁴. Although New Zealand can afford to implement training in some of the Olympic sports it is nowhere near the level of the USA. Is it fair game that the teams with the most advanced technology can dominate? Is it not what sport is all about; doing whatever it takes to have a competitive edge over your opposition? This technology is very expensive and only countries like the USA or Russia can afford to have this technology

⁵⁹ Retrieved from <<http://www.techradar.com/news/world-of-tech/go-for-the-gold-how-technology-helped-athletes-on-the-road-to-rio-1326022>>

⁶⁰ Retrieved From <<http://www.forbes.com/sites/blakewilliams3012/2016/08/03/wearable-tech-is-taking-team-usa-to-new-heights-ahead-of-rio-Olympics/#5589d5fe626d>>

⁶¹ Retrieved from <<http://www.radionz.co.nz/news/national/303865/sports-agencies-get-funding-boost-for-2020-Olympics>>

⁶² Retrieved From <<http://www.hpsnz.org.nz/article-type/media-release>>

⁶³ Retrieved from <<https://www.tvnz.co.nz/one-news/sport/other/heat-stress-training-not-only-secret-in-nz-cycling-teams-Olympic-kit>>

⁶⁴ Retrieved from <<https://www.tvnz.co.nz/one-news/sport/other/heat-stress-training-not-only-secret-in-nz-cycling-teams-Olympic-kit>>

implemented into their training. Zach Garrett, an American Olympic archer said that "without that type of immediate feedback, I don't see how we as athletes could progress to where we are now". Acknowledging that the technology that the USA has funded and put into their training regime is responsible for his progress in archery shows how big the impact of technology is on an athlete's training, it also shows the extent that the amount of funding can affect a team's success. The US Olympic Committee budgeted \$795,917,076 from 2009-2012⁶⁵. Furthermore there is a strong trend between the amount of funding that the USA puts into a sport and the USA medal tally in that specific sport⁶⁶. Or In Great Britain who put 230 million pound into funding every year in preparation for the Rio Olympics, the largest amount of all time. The result of this? Great Britain came second in the medal tally and brought home the most medals in their history. Compared to the Atlanta Olympics in 1996 when the team came 36th and only five million pound per year was invested⁶⁷. This shows the impact of funding on a team's success as teams with more funding have increased opportunity to pay for innovative training, more advanced technology, coaches and facilities. Teams that cannot afford to fund such innovation and technology are left at a disadvantage and have to find other ways of training to keep up with their wealthy opposition.

Through expensive technology and machinery the USA Sevens team can know the exact fitness levels of all players and monitor their precise movements eg; pressure in a fend, the speed of the ball, the muscles used during a pass and have exact data for every movement⁶⁸. The Fijian budget is significantly less than that of the USA with a budget of \$3.9 million⁶⁹. Due to this the Fijian team have a more simple training regime. Their training regime focusses on building fitness through hours of grueling hard work, not inside flash state of the art gyms like the USA, instead using sand

⁶⁵ Retrieved From <<http://usathletictrust.org/athlete-advocacy/usat-publications/how-well-are-us-athletes-supported-by-the-usoc-and-11-other-important-Olympic-questions/>>

⁶⁶ Retrieved from <<https://www.bloomberg.com/graphics/2016-Olympics-usoc-return-on-investment/>>

⁶⁷ Retrieved from <<http://www.independent.co.uk/sport/Olympics/rio-2016-team-gb-medals-how-much-did-each-cost-uk-tax-Olympics-medal-table-a7203321.html>>

⁶⁸ Retrieved from <http://www.espn.com/rugby/story/_/id/17144854/fiji-sevens-head-chile-pre-Olympics-training-camp>

⁶⁹ Retrieved from <<http://www.lbc.com.fj/sports/33923/3-9-million-preparation-budget-for-rio-Olympics>>

hills as their training ground⁷⁰. The Fijian team had to work harder due to them not being able to afford state of the art technology. The Fijian team's home country has a high cultural capital held on Rugby Sevens, the sport being described as "the nation's passion" by Fiji's coach Ben Ryan. This high cultural capital led to the Fijian Rugby Sevens team bringing home the nation's first Olympic gold medal. Whereas the USA's technocentric approach to training didn't even get them out of the pool stages. This is also due to cultural capital, the USA does not place a very high cultural capital on Rugby Sevens when compared to other countries. Portraying that advanced technology in training alone will not bring success and again there is no 'magic bullet'.

It may seem as though governing bodies are limiting the impact of technology in sport however this is not the case. For example the American, Russian and Canadian Ski teams had their uniforms designed by Columbia sportswear who designed an innovative lightweight zip and camouflaged snow pattern to limit the body movements picked up by judges. High tech sport equipment like this is seen in every sport from high tech swim wear to carbon fibre football boots to advanced bicycles in the cycling events. The Olympics is becoming a sport in which only the wealthiest countries can be successful. Not only do stricter limitations need to be emplaced on equipment but equal opportunities during training should too be a factor that sporting governing bodies consider. This trend will continue as technology in sport continues to develop. Governing bodies need to find ways of limiting the division between rich and poor teams in order for sport to be a level playing field. In the Olympics, suit technology creates a big division in sports like swimming and cycling. All athletes should wear the exact same suits and in sports like cycling there should be standard equipment issued to the athletes. This will mean that the game is about who is the better athlete as opposed to which team could afford the smartest, most innovative scientists.

⁷⁰ Retrieved From <<http://www.news.com.au/sport/rugby/jarryd-hayne-suffers-the-brutal-wrath-of-the-fijian-sand-hills/news-story/32f577863bf1ea3e3b91149f2bc17e0f>>

Final Thoughts

"It is only through work and strife that either nation or individual moves onto greatness"- Theodore Roosevelt.

In reality and notably in today's technology based world this quote does not apply, especially when analysing the procurement of sporting expertise. Attempting to uncover what it takes to acquire sports expertise is not an easy endeavour. Researchers and scholars will forever be trying to conclude the acquisition of sporting expertise, pursuing what it is exactly that separates the elite from the average. There are just so many unforeseen variables and such wide variety that it is nearly an impossible task to determine a single 'magic bullet'. What is certain though is that the effect of technology is growing. With this growth many questions surrounding the ethics and fairness of sport will arise. Sport NZ's holistic approach with emphasis on physical literacy is very beneficial to young people in society, encompassing young people as a whole. As opposed to ignoring aspects of their identity and using them as a vehicle to earn a profit or promote a certain ideology. Physical literacy is proven to increase participation, especially amongst young people. As obesity rates are increasing in New Zealand costing the nation significantly, Sport NZ's approach to embedding physical literacy and deliberate play in society should be enforced with more authority.

As technology is becoming more prevalent and the cost of participating in sports is increasing we in New Zealand do not want to see the division between socioeconomic groups in professional sport continue growing like what is currently occurring in the NBA. Sport NZ should learn from the NBA's growing division between socio-economic groups and develop programs to combat the inequality in participation rates in New Zealand. By offering safe areas to play sport in lower income areas Sport NZ will increase the participation rates amongst young people in low income communities. In doing so the division between rich and poor physical activity rates will decrease, child obesity rates will decrease and the future of New Zealand will be brighter.