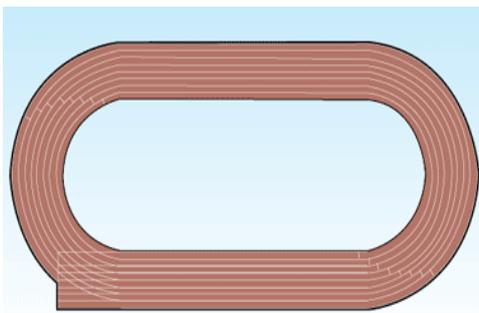


# INSIDE



# TRACK

**April 2022**

Welcome to the twelfth edition of **INSIDE TRACK**, the online magazine designed to support the teaching of Pearson GCE PE.

The magazine provides articles written by senior examiners and, on occasions, guest writers, together with contemporary items of news and reviews of resources that may be helpful for teaching or background reading.

Guest contributor Rob Harley takes an in-depth look at training aimed at enhancing agility and change of direction.

Also in this edition, Dane Smith considers how winter Olympians were caught out as they utilised technology to maximise performances and Alex Armitstead's interview considers a day in the life of someone working in sports social media.

### **Contents:**

- *News and Reviews*
- *Enhancing agility and change of direction*
- *A view from inside subscription sports video streaming service DAZN*
- *Ski jumpers wearing big suits for long distance*

### **Other Pearson resources for GCE PE**

A wide range of materials, including previous editions of Inside Track, can be found on the Pearson website.

[Edexcel AS and A level Physical Education \(2016\) | Pearson qualifications](#)

### **Get in touch**

If you have particular requests for how the magazine can support you, or you wish to contribute, please contact the editor (Dennis Tattoo) at:

[insidetrackpearson@hotmail.com](mailto:insidetrackpearson@hotmail.com)

### ***In the News***

***Two recent stories in the media which provide contemporary detail teachers and students might find of interest.***

#### **Eton v Harrow axed from Lords**

Several media outlets reported that Eton v Harrow, the longest running fixture at Lord's which dates back to 1827, will no longer be played at the ground. In an attempt to broaden the number of teams and players able to play at Lords, the MCC decided not to host one of its most traditional days.

#### **Los Angeles 2028 programme changes**

In a continued effort to attract younger spectators, skateboarding, sport climbing and surfing have been included in the Los Angeles 2028 Olympic programme.

Several traditional sports, boxing, weightlifting and modern pentathlon, face not being included and have to make changes to their governance before being considered for the programme. Boxing was found guilty of result-manipulation at the Rio Olympics, weightlifting is dogged with doping issues and the Modern Pentathlon's governing body has to replace the horse riding section after a German coach was sent home from the Tokyo games for punching a horse.



***Sport climbing will again feature in the 2028 Olympics***

## Agility or Change of direction?

### Implications for training to enhance performance and reduce risk of injury.

**Rob Harley is a Principal Lecturer of Sports Science at the University of Brighton.**

***In this article he provides an in-depth look at training for improving agility and changing direction. It will be of interest to candidates considering this for the PDP.***

This paper discusses training aimed at enhancing agility and change of direction ability and reducing risk of injury during the deceleration phase of these manoeuvres.

The paper provides a rationale as to significance of this component of fitness to sports performance, although it is also important to understand the distinction between these two aspects of performance.

#### Topic area definitions

(Bizley 2016) defines agility “the ability to move and change direction quickly, at speed, while maintaining control”.

While some change of direction movements in sport occur in response to a stimulus (i.e. moving sideways to block the path of an attacker in basketball), others are pre-planned (i.e. running between the wickets in cricket).

Shepard and Young (2006) proposed that agility performance should be separated into three areas, the physical ability (strength and speed qualities), technical ability (foot and body positioning) and cognitive ability (decision making speed and accuracy) and therefore defined agility as “a rapid whole-body movement with change of speed or direction in response to a stimulus”.



Tasks involving a pre-planned change of direction should purely be described as “change-of-direction” (COD).

Successful performances requires high performance levels in COD ability (physical and technical) and well-developed cognitive and decision making ability. This distinction has implications for training prescription which will be discussed later in the paper.

## The importance of agility and COD

There are numerous situations in many sports where performers need to change speed or direction to get into the desired position on the field or court.

A number of studies have highlighted the importance of agility and COD ability in relation to sports performance (Shepard et al 2006, Young et al 2015, Pojskic et al 2018).

Pojskic et al (2018) has found that more experienced footballers were significantly more proficient on tasks of reactive agility and change of direction ability, while jumping, sprinting and reactive strength performance were similar across the performance levels. This adds weight to the argument that agility and COD ability are significant determinants of success in football.



***Good agility and the ability to change direction are vital for success in football.***

When sports involve a rapid change of direction manoeuvre (i.e. a side step in rugby) athletes are faced with high impact ground reaction forces.

McBurnie et al (2021) highlighted that when these manoeuvres are repeated the athlete can experience tissue damage and neuromuscular fatigue which may then lead to diminished co-ordination proficiency, which in turn may lead to increased risk of injury.

It is therefore imperative that strength and conditioning coaches find evidence-based strategies to help with the enhancement of performance and to reduce risk of injury.

## Training to enhance COD ability

Although it is recognised that correlation doesn't equal causation the evidence provided in Suchomel and colleagues (2016) review provides strong support of the hypothesis that strength positively influences jumping and speed ability. Of the 116 correlational analyses they synthesised 78% displayed a moderate or greater relationship between strength and jumping performance, while 85% displayed a moderate or greater relationship between strength and sprint performance.

Seitz et al (2014) meta-analysis results provided evidence to support that increase in lower-body strength positively influences sprint performance.

The benefits of strength training on COD performance have also been reported both in short term and long term interventions.

Keiner et al (2014) investigated the effects of 2 years of strength training on COD performance and found moderate to high significant correlations between relative maximum strength and COD performance assessed using a COD task which involved football players sprinting a total of 10m with 2 changes of direction (2.5m change of direction, 5 m change of direction, 2.5m with the COD being performed at a 60° angle).

They reported that the intervention group who followed a periodised resistance training programme, two days per week in addition to soccer training, significantly improved their COD performance while the control group (who only performed soccer training) showed no significant improvement over the same period.

More recently Keller et al (2020) employed COD assessments involving including 4, 6 and 13 changes of direction. Their study implemented 4 training conditions (horizontal, vertical, max strength and explosive strength) each group performing 2 sessions a week for 4 weeks. All 4 methods improved the COD speed in the U15 team sport athletes.

Thomas et al (2009) reported a six week, twice-weekly, drop jump training protocol (80 foot contacts progressed to 120 foot contacts over the 6 weeks) significantly ( $p < 0.05$ ) improved performance on a 5-0-5 COD test and a vertical jump ( $p < 0.05$ ) but did not change in 20m sprint performance.

While Beato et al (2018) implemented 6 weeks, twice weekly, training including 4 sets of 3 short shuttle runs with 4 changes of direction (totalling 48 COD's) and drop jump training involving 4 sets of 5 jumps from 60cm immediately followed by a maximal vertical jump and 4 sets of 5 jumps over 15cm hurdles (totalling 60 jumps) 2 sessions a week for 6 weeks.

Their results showed slight improvements in sprint and jump performance but no significant improvements on the 5-0-5 COD test. They explain their lack of significant findings in COD ability being due to the dose response principle (i.e. not a large enough increase in training load) given their subjects already high trained status.

Two more recent training studies conducted by Thomas Dos'Santos and colleagues (2019 and 2021) have also demonstrated significant improvements in COD performance when conducted on junior (U17's) and senior soccer players. Improvements in a COD deficit test and a qualitative field based cutting movement assessment score were approximately two times greater than the control group following six weeks of specific COD speed and technique modification training.

The intervention group performed two, 20 minute, specific deceleration training sessions per week involving a gradual increase in intensity and individual technical feedback on their running mechanics. The control group performed standard sprint drills focusing on acceleration.

This applied research is a good example of the application of the key training principles of specificity and progression.

It appears that strength, ballistic and technique training will help improve COD performance, however, factors such as stage of maturation, training history and starting strength levels can influence the training response.



***Training to enhance technique will help improve the ability to change direction although the will be influenced by training background and level of maturation.***

## Training to improve agility

As discussed earlier the ability to change speed or direction in a number of sporting scenarios involves a response to a stimulus.

For this reason, Young and Rogers (2014) investigated the effects of small sided game and change of direction training on reactive agility and COD speed. Twenty five U18 Australian rules football players were randomly allocated into one of the training groups (SSG vs COD training) and undertook 15 minutes of training before each squad training session with a total of 11 sessions performed over 7 weeks (1 or 2 a week).

The COD training group performed short sprints with lateral cutting movements involving accelerations and decelerations while the SSG group played either 2 vs 2 or 4 vs 4 on a 15m x 15m and 20m x 23m size pitch respectively.

The novel finding of their research is that the SSG group significantly ( $p < 0.05$ ) reduced performance time on the reactive-agility task, while the COD group showed no change. Neither group improved performance on the planned agility task. The authors proposed that the improved performance on the reactive agility task was due to improved speed of decision making as movement speed showed no improvement.



*Small sided games can contribute to agility by improving decision making*

They concluded that the use of SSG's can be a valuable tool for the coach to implement as long as the games are designed carefully and involve consistent involvement of all players involved. It is important to note that the drills must be structured in a way to allow players to maintain a high intensity of effort.

To help achieve this Young and Rogers structured the bouts of SSG's as 30 to 45 seconds of exercise followed by the same duration of recovery (1:1 exercise-to-rest ratio).

This is different to how the drill would be structured to improve aerobic fitness, where a longer work duration and shorter recovery would be employed (i.e. 3 mins exercise and 30 seconds recovery, 6:1 exercise to rest ratio).

## Training to reduce risk of injury

McBurnie et al (2021) suggests that horizontal deceleration training may play an important role in reducing the risk of injury for multidirectional sports athletes. The paper suggests that evaluation of deceleration capacity and technique should form part of a multidirectional athletes assessment and monitoring programme. Also that the acute and chronic exposures to high intensity decelerations with individualised training bands using global positioning systems (GPS) should be monitored as it is recognised that a lack of periodisation and large increases in workload may increase the risk of injury (Gabbett 2016).

McBurnie et al therefore propose that the progressive development and maintenance of horizontal deceleration ability is paramount as part of a multidirectional speed development programme.

This supports the work of Tom Joel formerly Lead Sports Scientist for Leicester City FC who presented at the Catapult Football Performance Workshop back in November 2018, outlining how Leicester implemented supplemental deceleration drills into players training (watch from 12mins to 15 mins to see a video of the runway drill).

<https://www.youtube.com/watch?v=Khfsct-uYUo>

## Conclusions

This article discusses the rationale to design, deliver and evaluate multidirectional training and has reported the findings of training interventions to support the design of future training programmes.

It is important to remember that if you are trying to improve performance which involves agility the drills must involve some aspect of task specific decision making (i.e. using small sided games).

The physical aspects of strength can be enhanced through structured resistance based training, which may transfer across to enhanced speed and power production, and that attention should be paid to the deceleration element of COD / agility manoeuvres from both a physical load and technical perspective.

For further discussion in this topic area take a look at this web page which gives a good overview and some good training recommendations with excellent video examples.

<https://www.scienceforsport.com/agility/>

## Media and sport in the 21st Century

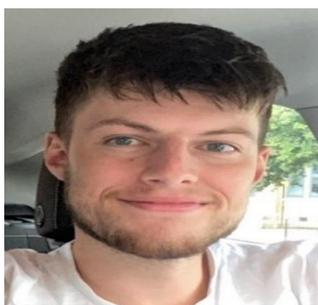
Media is changing the face of sports in the 21<sup>st</sup> century. The average daily use of social media is around two and a half hours and more than half the world uses social media. This is a lucrative arena. The big hitters are Facebook and YouTube but also featuring in the top ten is Tiktok.

The world of sport has not gone untouched by these media giants with channels regularly showing content from major sports events across the globe. Amazon Prime has rights to show certain Premier League football matches and DAZN is emerging as a major player in the world of sports entertainment.



DAZN is a subscription sports video streaming service. Established in 2016, it now has offices around the World including the UK in Leeds and London as well as New York and Tokyo. DAZN produces content on a range of sports and has recently covered the Super Bowl.

To gain an insight into the future of sports media, we interviewed Assistant Producer Alex Armitstead, pictured.



### ***What attracted you to working for DAZN?***

DAZN is a company that was on my radar long before applying for a job here. After noticing the massive global expansion of the company and the way it changed the game of sports broadcasting, when a job appeared here as an Assistant Producer it was a no-brainer to apply and I was lucky enough to get the role!

### ***Did you have a background in sports media then?***

Yes, I worked for two years at Huddersfield Town FC where I put together TikTok items which were immensely popular and received millions of views. This involved taking game clips and editing to short and interesting features.

### ***What is the most exciting aspect of your work?***

The most exciting aspect of my work is working on global events. I recently worked on our Super Bowl LVI coverage for DAZN Canada, where we produced our own organic pre-game feature with part of our team travelling to LA.

### ***Can you give us an outline of your typical working day?***

In my role, every day is different but that is what makes it exciting.

During any day I could be writing a script for a feature, pitching ideas, gathering content and highlights, producing feature content and collaborating with colleagues around the globe.

### ***What sort of content does DAZN produce?***

DAZN Canada produces a variety of high quality, exciting on demand and live content. From exclusive interviews with Premier League stars to the biggest events in sports, there is something for everyone on our platform.

### ***Have you covered any exciting recent events?***

Covering Super Bowl LVI was a really exciting opportunity for me and to cover what we consider the greatest show on earth was a fantastic experience.

### ***What future directions do you think sports media will take?***

I think sports media is something that is constantly evolving and changing. Here at DAZN we are always looking to change the game to keep everything fresh and exciting.

### ***How popular is live media coverage of sports?***

With sport such as American Football growing massively in popularity globally, live sports are more popular than ever before.

With revolutionary new concepts such as Fan Controlled Football coming to our Canadian platforms, who knows where the future of sports coverage will go!

### ***What is Fan Controlled Football?***

This is where real American Football games are played in a high-tech studio arena and streamed live. The big bonus is that fans can call the plays. DAZN are teaming up with FCF to bring live and on-demand events to its subscribers.

**Thanks for this, Alex and just to conclude, could you list the benefits and drawbacks of social media for sport in general**

The benefits are: it is so easy to access on phones; you can view more matches and content; it provides a variety of formats such as TikTok that appeals to younger audiences; it expands the presence of sports such as MMA and NFL to wider audiences

Drawbacks include that it can be used for abuse from anonymous accounts e.g. racism directed at England footballers; people post things they would never say in person; players can sometimes be offended by content; it highlights controversial aspects of sport; there can be a negative focus on officials and coaches

## Ski Jumpers disqualified at Winter Games

*GCSE Principal Moderator, and regular contributor to Inside Track, Dane Smith highlights an issue which arose at the recent Winter Olympics.*

*Students can apply the discussion to the topic on ethics and deviance in sport (5.4.3)*

During the last Winter Olympics, female athletes from several mixed ski jump teams were controversially disqualified from the final due to issues surrounding the fit of their jumpsuits.

The skiers' suits were disqualified after being checked by officials as they were deemed to be too large and could give them an unfair advantage (1).

### What is the issue with the jumpsuits being too large?

In ski jumping the measurements for the jumpsuits are strict so that they do not end up functioning like wings (increasing in-flight surface area which increases lift) and prevent athletes from jumping too far due to advancements in suit technology.

The thickness of the suit has to be between four and six millimetres and must conform to the body shape in an upright position with a maximum tolerance of two centimetres to the body size at any part of the suit (2).

### Science behind the Jumpsuit regulations

There are three major factors to consider: gravity, lift and drag.

**Gravity** pulls any object in flight down, and athletes cannot lessen its effect. However, athletes can produce lift forces that can balance the forces of gravity that allows the skier to glide in the air.

**Lift** is produced when the skier is moving, as the skier will collide and push air particles down.

In accordance with **Newton's Third Law of Motion** (for every action, there is an equal and opposite reaction), air particles will push the skier upwards, creating lift. Increasing speed, **angle of attack** (angle of the skier relative to the direction of air flow) and increasing surface area will also increase the amount of lift (2).

In-flight, the skier also adopts the V-shape with the skis and with arms slightly away from the side of the torso (see below). This body position maximises lift while reducing **drag** as much as possible (4).



(3)

*Ski jumpers adopt V-shape with the skis to help maximise lift while reducing drag as much as possible*

### So, was it deviance?

The Norwegian skiers don't seem to think so:

*"They measured the suits in a completely different way and used a new procedure. We were told to stand in a different way than we have ever done before" (2).*

### Bibliography

1. *Winter Olympics: five ski jumpers disqualified due to jumpsuits - Sports Illustrated*
2. *Suit violation rule in Olympic skiing explained after chaotic mixed team final (hitc.com)*
3. *2018 Winter Olympics: Ski Jumping | FactMonster*
4. *Falling with style: The science of ski jumping | Smithsonian Science Education Center (si.edu)*