Skill Acquisition, Teaching the behaviourist theories

In the 21st century, people tend to want to decode success. Why does it happen? Owen Slot, author of the Talent Lab on complexities of the route to medal success
Welcome to the second edition of INSIDE TRACK, the online magazine designed to support the teaching of Pearson GCE PE. The termly magazine provides material to support centres in their delivery of the course with articles written by senior examiners and guest writers, together with reviews of resources that might be helpful for teaching or background reading.

In this edition of INSIDE TRACK, our guest writer is Owen Slot, chief rugby correspondent on The Times, who has three times been named Sports Feature Writer of the Year and three times Sports News Reporter of the Year, and also author of the acclaimed book The Talent Lab, which was reviewed in the first edition of INSIDE TRACK.

Get in touch

It is hoped that INSIDE TRACK will be a helpful resource for centres delivering the Pearson specification. If you have particular requests for how the magazine can support you, or wish to contribute, then please do contact the editor at insidetrackpearson@hotmail.com.

Support materials

To ensure you have access to the most up to date material to support your candidates, the senior examinations team have developed a series of topic guides. As books rapidly go out of date, particularly in fields such as sports technology, these guides are updated annually, with the new version being available in September each year.

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03 Owen Slot, the complexities of trying to decode the route to medal success in the Olympic Games
There are 20 chapters in The Talent Lab and around 50 stories of how British athletes have won Olympic medals. I wanted to write this book because, as a journalist for The Sunday Telegraph and now The Times, I have covered every summer Games since 1996, so I have seen Great Britain when they were 36th on the medal table in Atlanta and have witnessed the climb to second 20 years later. It has been one of the most extraordinary stories of turn-around sporting success.

I wanted to write about how and why this has happened. The immediate answer is money, but this is just a part of the story. GB gets more value for money than most of its rivals. In 2012, GB's medal haul roughly equated to the Japan and South Korean medal count put together – and yet, put together, Japan and South Korea had spent seven times more on their Olympic team. So - certainly money helps create opportunities, it doesn't help you take them.

Which was my best medal of the lot? Sometimes I think it was Chris Hoy in the kilo in the Athens velodrome in 2004. Sometimes the women's hockey gold in Rio. Sometimes Tom Daley's bronze in London (they don't all have to be gold, for me!). Sometimes all four of the medals – two golds, a silver and a bronze – won by the Brownlee brothers in triathlon in London and then Rio.

Why these? Not just because it was such a privilege to witness them all. Primarily, it is because I was allowed to develop such a deep, insider's understanding of how these medals were achieved. That gold that Hoy won in 2004 – he would never had won that had he been at his peak in Atlanta eight years earlier. Tom Daley might not have even been competing as a diver. I seriously doubt that the hockey women or the Brownlees would have won medals either.

What got them across the line is no one simple formula. Hoy was a lot about psychotherapy. The Daley story is wrapped up in Talent ID and how he was identified as a pre-pubescent and fast-tracked through the system. The hockey story is about elite coaching. And the Brownlees is about a winning environment.

In the 21st century, people tend to want to decode success. Why does it happen? I looked for an easy solution and found nothing of the kind. Success happens in myriad different ways; what you see, over 50-odd Olympic medals in The Talent Lab, is that GB has found a system to make that happen.
Principal Examiner Ellie Bunston offers a summary on the increasing use of cryotherapy to aid recovery.

One example of a rehabilitation method or recovery technique is cryotherapy. It has been discussed frequently in the press, hitting the headlines when rugby teams used it in the preparation for the Rugby World Cup in 2011 and Cristiano Ronaldo had one installed in his home.

Rather than the traditional ice baths, performers use a cryotherapy chamber to aid whole body recovery. Typically, the body is subjected to temperature of -100 degrees C. It is a walk-in chamber, and those using liquid nitrogen to cool the air inside can get as low as -160 degrees C. Sessions usually only last a couple of minutes which can reduce the amount of time that athletes spend on this element of their post-match routine when compared to using an ice bath which takes longer. The idea is that the very cold environment restricts inflammation thus aiding recovery, as vasoconstriction reduces blood flow to the areas exposed. Some athletes use it to speed up recovery from training and it can also be used to reduce inflammation around a specific injury. The exposure to extreme cold causes vasoconstriction of blood vessels in the skin with blood directed to protect the vital organs. Once treatment concludes blood vessels dilate and blood flows back and assists the lymph system to work more effectively. However, it is an expensive process and can be difficult for athletes to access.

Some universities and medical centres have them installed so if a team train close to a venue that has this facility that makes it easier to access. Some teams have purchased their own chambers and some companies, like Cryoaction, offer transportable chambers. The evidence to support this from studies is mixed. A small German study found endurance athletes recovered more quickly but another study suggested there wasn’t enough evidence that it relieves muscle soreness. There are also mixed views as to whether it is as effective for those with more body fat.

Some athletes have continued to use ice baths even though the availability of baths, supply of ice, ease of transporting or timing, risk of side effects such as shock or ice burn, the unpleasantness of it and muscle stiffness can cause issues for this approach to speeding up recovery.

Students need to be aware of the various alternative recovery methods that athletes can use, including: hydrotherapy, active recovery, ultrasound, physiotherapy, hyperbaric chambers, oxygen tents, compression garments, nutrition, climate chambers, strategies of POLICE and RICE, massage, and stretching.
Newton’s Three Laws of Motion

Principal Examiner Dee Gannon offers an overview of Newton’s Laws of Motion which are taught as part of topic one: Applied anatomy and physiology.

Candidates should be able to name and describe the relationship between a body and the forces acting upon it for each of Newton’s three laws. They should also be able to show an understanding of the three laws through sporting examples.

1. **Newton’s first law (law of inertia)** states that an object will remain at rest or in uniform motion in a straight line unless acted upon by an external force.

   **Sporting examples include:** a football remaining stationary until kicked, a tennis ball travelling in one direction until hit by a racquet or a spiked volleyball heading towards the ground until deflected by another player.

2. **Newton’s second law (law of acceleration)** states that the vector sum of the forces, \( F \), on an object is equal to the mass, \( m \), of that object multiplied by the acceleration, \( a \), of the object. This is most commonly displayed as \( F=ma \) where \( F \) is the net force applied, \( m \) is the mass of the body, and \( a \) is the body's acceleration.

   **Sporting examples may include:** the more force a footballer applies on the ball when shooting, the faster it will accelerate towards the goal, and if a cricketer was to hit two different balls with different masses with the same amount of force, the one with the smaller mass will have greater acceleration.

   **N.B.** This is an obvious topic for calculation questions and candidates should be familiar with using all variations of the formula.

3. **Newton’s third law (action-reaction law)** states that for every action, there is an equal and opposite reaction. This means that forces always come in pairs – when one body exerts a force on a second body, the second body exerts an equal force in the opposite direction.

   **Sporting examples may include:** any action that involves pushing on the ground will have the reaction of the ground pushing back with equal force but in the opposite direction, a bat or racquet hitting a ball will have the reaction of the ball pushing back on the racquet with equal force but in the opposite direction.

The reason why these forces do not just cancel each other out is beyond the specification, but does make it easier to understand and avoid some misconceptions!
Sports Psychology: teaching the topic

Principal Examiner Colin Maskery suggests an approach to teachers on the delivery of the sports psychology component.

The topic of sports psychology has traditionally proved to be an interesting and engaging one for both staff and students. One of the reasons is the various psychological aspects studied at GCE may well have personal resonance. Students have been able to relate to those aspects that affect them personally and collectively such as anxiety and aggression or the effect of an audience on a performance.

One way of approaching sports psychology is to focus the whole of this topic area on the central debate of nature versus nurture. Nature being the innate genetic inheritance we receive from our parents (consider the work of Eysenck and Cattell) while nurture is the effect of environment on shaping how we think and, more importantly, how we behave (look here for the work of Bandura and Social Learning Theory). The debate can be revisited time and again with clear arguments presented for both sides.

Sports performers behave differently when external, as well as internal, influences and stimulus are present. The sports psychologist has the key role of ensuring on the day of a required performance the performer achieves at their optimum level – mentally or cognitively, as this drives any physiological actions.

If we think of the influence successive generations (nature) have on us genetically then we can try and explain those outcomes in terms of behaviour as ‘part of our make-up or ‘what I am like’. Some performers are always nervous, while others are over-confident when faced with similar situations. While for those who believe we are born with a blank canvas and that it is our social environment that shapes our behaviour (the green houses we are brought up in and live in) that determines our thoughts and actions.

Teaching and understanding this topic can centre on the theories proposed in the nature v nurture debate. As each decade passes and new research is released from universities, and other studies, these influence the ‘pendulum’ that has swung back and forth in this debate. Currently it is thought that while our social environment is key to shaping our actions it is overridden by our genetic inheritance – just! One way to test this would be to study identical twins separated at birth and study how they have evolved under different environments. Studies by the University of Minnesota on twins have supported both schools of thought but nature is now back as a primary influence.

D.C.Rowe, in his book ‘The Limits of Family Influence’, leans towards nature especially regarding personality, or character, based on those identified core traits. The book suggests that the character of adopted children often bears no resemblance to the adopting parents while studies involving identical twins demonstrate that traits such as extroversion or agreeableness could only be hereditary. Abuse or neglect is often presumed to lead to delinquency but there is no supporting evidence. Personalities are shaped by peer groups, schooling and religion and while behaviour can be influenced by these, underlying personality traits tend to remain.
So, maybe the answer lies somewhere between the two. *Interactionists* would suggest that we cannot explain all behaviour just as either nature or nurture and that a combination of the two is more realistic. Behaviour then, is a function of both our *personality* and our *environments* working together:

\[ B = f(P + E) \]

Some key questions that can be investigated as you work through your sports psychology topics:

- Can aggressive behaviour in sport be learned, or is it innate?
- Can you overcome state anxiety?
- Is high self-efficacy a result of vicarious experiences and verbal persuasion or something you either have or have not?
- How can you explain the concept of achievement motivation in the nature v nurture debate?
- Are effective leaders born or are made?

**Frequently asked questions on components 3 and 4**

Experienced Moderator and Team Leader Dave Hebden has been the lead trainer at a number of well-attended training sessions in the first term of this academic year, both online and face-to-face. He felt it would be useful for readers of INSIDE TRACK to read about some of the frequently asked questions about components three and four.

Is there a minimum number of candidates required for a centre visit for live moderation? Three students or more is the usual minimum for a live moderation. Any queries should be addressed to the *assessment team*. If the centre would prefer a live moderation, maybe consider a joint moderation with another local centre. Up to two centres may join for a joint moderation.

How can centres support students in the development of their practical work? Suggestions include:

- Having regular identified lessons for individual/group practice and to monitor progress
- Encouraging involvement in school/community clubs and teams
- A mentoring programme to support and encourage individuals, perhaps exploiting the interests of other staff
- Student self-assessment/peer reviews using the assessment criteria with action plan for further improvement

How can students access data on test scores on elite athletes so as to go beyond normative data? The key point here is to encourage students to go beyond the normative data which is often from decades ago and using non-sporting groups. Comparing scores against school/club/centre/peer data is also valuable. Some candidates last year referred to the performance data/testing of elite juniors playing at their school or a nearby club.

The board is encouraging students to use more contemporary fitness tests. Where can we access these? Many NGB websites journals and serious text books have reference to test options that go beyond the standard tests used and which are often dated. Popular websites have many tests that offer options more appropriate than a number of students offered last year. Students will usually find more valid tests if they do serious research.

Can the component 4 work be presented as a PowerPoint and presented to others and videoed? There is no provision for this in the specification, in part because it was difficult to monitor word count issues. The work may be presented in either electronic or hard copy format is indicated in the specification.

How do you ensure performers produce their optimum performance? Ensure drills are designed to promote intensity and match the ability level of the candidate. What are the consequences of too easy/too difficult drills? Ensure candidates are matched with similar abilities, for example too much of a mismatch in a racquet sport can put stronger players at a disadvantage of rallies keep breaking down. Ensure drills/practises are dynamic, explosive and undertaken with intensity. Try to ensure several skills, techniques and decision making processes are encompassed in selected drills, before the full sided games.

Can you use performers outside of the centre to optimise performance? Yes, so long as “Safe Practice” is adhered to, as per BAALPE Safe Practice document. For example, a racquet player could play against a club team mate. However, this can be more problematic for team games. Health and Safety and Safeguarding are of prime importance.
Component 4 – Getting the best from students

Principal Moderator Dane Smith offers advice on how to help students achieve well in their component four work.

The assessment of the Component 4: Performance Analysis (PA) and the Performance Development Programme (PDP) will be undertaken for the first time this academic year, although centres that entered students for the AS year in 2017 have already experienced the Performance Analysis tasks. In order to guide students in the right direction in these tasks, it is important that the following points are considered.

Performance Analysis

1. It is imperative that the physiological demands of their sport are researched initially in order to make sound judgements of the components of fitness required. A brief introduction that includes these demands can set the tone and help to justify the three components selected.

2. Once the three components of fitness have been established, the students need to select relevant fitness tests. This is where students need to undertake research in order to validate the tests used. Generic tests from websites such as www.brianmac.co.uk and/or www.topendsports.com are fine as most of the tests do evaluate the components of fitness selected, but can lack specific relevance. For example, the Multi-stage fitness test is suitable for aerobic endurance, but is it totally valid for a rugby player?

3. The use of elite results/standards can be helpful to make an in-depth analysis of the student’s strengths and weakness, as can comparison with peers in a school or club setting. This information is important for the student to explain the priorities for training and to make informed decisions regarding the aim(s) for the PDP.

The exclusive use of normative data may not be especially helpful for students as these figures are often established for the general public and can also be dated. The inclusion of testing protocol is not specifically required although there may be points raised regarding issues related to validity and reliability.

Performance Development Programme

4. Once the aims have been established (use SMARTER), the student should utilise knowledge from the specification to construct a PDP. This should include, but is not limited to, principles of training, application of periodisation, relevant methods of training and the use of appropriate monitoring fitness test(s).

Please note that this is not an exercise programme, rather a development programme where students select a component(s) based on the PA tasks. Too often in the legacy specification, students would include information in the development plan that was irrelevant. Centres must be careful with the new specification, as the total word count for the whole of component 4 is 3500 words.
5. The application of training should be evidenced in detail. Intensity levels and exercise selection should correspond with the overall aim(s).

6. The evaluation is an important section of the task, and this should not be rushed. Not only should students analyse their fitness test results, but also the application of the PDP to their own performance. Examples of how this could be completed could be through the use of GPS data, implementation of a notational analysis or a witness statement.

Managing the workload throughout the academic year(s) can be challenging. One option is to complete the Component 4 work early in the academic year, therefore allowing centre staff to assess and moderate the tasks long before the deadline. Although this requires planning and marking initially, it can save time later in the year. It also helps to reduce the pressure on students as they approach the May 15th deadline, when more time should be concentrated on the two exams.

Principal Examiner Ellie Bunston offers advice on the implications of the different command words used in the exams. In preparation for the examination candidates need to be familiar with the command words used by the board; these can be found in the back of the specification. Some command words are used for extended responses, such as Compare, Discuss, Evaluate, Analyse, which are marked on a levels based grid worth 12 marks for AS and 15 for A level. Other words are used for long responses worth eight marks, including Assess, Examine and Justify.

Command words typically used when a short, closed, response is required include Classify, Give, List, Name, Define or Identify and State. Other questions are marked point by point with a short open response with command words such as Describe or Outline which are typically between two and five marks. Some questions require a longer response with command words like Explain, Summarise and Consider. Each command word has specific requirements which are outlined in the specification.

Candidates need to understand the implications of the various command words and rehearse for the exam regularly, understanding the implications of the command word for their answer. For example, with the command word Explain, the answer needs to be expressed using linked points. A question will sometimes have another key word in it – such as performance, preparation or recovery. Candidates need to take note of this and apply their examples to the time period referred to. If a question asks for examples they must be included in the answer to score well.

Definitions stated in the specification should be well learnt by candidate, with key terminology from the specification needing to be spelt correctly. Candidates need to be aware of how long to spend on questions in order to be able to attempt all the questions on the paper and have a few minutes to check responses at the end of the exam. Regular timed practice can be helpful here.

In extended responses candidates might consider the benefit of offering a counter argument that can be given. The counter argument often provides for a balanced response in a persuasive answer and would typically offer two stages. Firstly, a ‘turn-against’ view when you challenge your argument and then a ‘turn-back’ to re-affirm it.

Candidates must ensure they focus their response on the question asked in the examination rather than to just write everything known about the topic or regurgitate an answer from a similar question prepared as part of the revision process or during the course of study.
The essentials of videoing practical work

With increased emphasis on the importance of videoing practical work, Chief Examiner Dennis Tattoo answers those frequently asked questions.

When do centres have to video practical work?

Under the guidelines issued by the Department for Education to all exam boards, centres can only request a Review of Moderation or Marking, previously referred to as an EAR, Enquiry About Result, if the performances that are seen on the day are recorded.

Recording performances on the moderation day is not compulsory, but, given the requirements around reviewing marks, it is likely that some centres will wish to video the activities undertaken by candidates in the presence of the moderator.

Audio-visual evidence of performance in sports/activities, which is part of the sample and cannot be seen ‘live’, is compulsory and should be available to moderators on the moderation day. Only material seen by the moderator on the moderation day must be submitted if a review of marking is requested.

In situations when full games, such as 15 v 15 rugby, cannot be presented live, centres should provide recorded evidence of candidates in a competitive situation, such as in school, club or county fixture. In these instances, the recordings would be the only evidence of a competitive performance seen by the moderator. Centres are not permitted to provide a live competitive performance for the moderator in addition to the recorded evidence or vice versa.

What needs to be included in the recording of a moderation day?

Recordings should be an unedited recording of each performance, although the camera may be stopped and started to avoid wasted time on irrelevant material, such as when teams are being organised or practices set up during the practical work.

What needs to be included in a recording of a performance being used for assessment purposes when an activity cannot be seen live?

Just as for live moderation, structured practices and formal / competitive performances should be recorded. As for recording of live moderation, the recording should be from one performance which should be continuous and unedited, although it is acceptable for the formal/
A competitive element to be recorded at a different time to the practices. The recording should be of sufficient length to support the centre’s mark.

Please note that edited ‘highlights’ of a candidate is not an acceptable form of evidence.

What guidance can you suggest for videoing a cricket match or team sports which take a long time?

Recordings of entire matches are not expected. However, the recording should be continuous and unedited. Some of the best recordings in the first year of the specification showed a series of demanding conditioned practices together with one complete half of a football match, total running time 60 minutes. In the case of cricket, a bowler might be shown bowling a series of consecutive overs, with the camera stopped when a teammate is bowling and with the timing on the video accounting for this. For a student being assessed in batting a section of, say, 20 minutes play from a lengthy innings would usually be sufficient.

What permissions are needed before filming a student?

Prior to recording, centres should have permission from the parents/guardians of all those who will appear in the video recording. Pearson has a standard consent form that can be used. Any problems around consent should be referred to the PE Assessment Team. Centres are encouraged to alert students to the need for moderation days to be filmed at the point at which they are choosing A level courses. Centres are responsible for matters relating to safeguarding and the recording of practical performances.

What format should be used when recording practical work?

Recordings should be produced in a standard / common format so that viewing images is straightforward. If in doubt, centres should contact the assessment team at Edexcel for clarification and/or advice.

Where can I get further information about videoing practical sessions?

Additional advice is available in appendix 5 of the specification. Pre-recorded training material is also available on the website, which includes examples of practical work.
Principal Examiner Andrew Armitstead offers a summary of behaviourist theories.

Classical conditioning

- Proposed by Pavlov, Watson and Raynor
- Concerned with involuntary behaviours
- Conditioning the SR bond
- Pair conditioned stimulus with an unconditioned stimulus
- Association leads to a conditioned response

Operant conditioning

- Skinner and Thorndike
- Concerned with all other voluntary types of learning
- Trial and error learning
- Reward correct response
- Reinforcement (positive, negative and punishment) is vital

AO1 Knowledge and understanding

1. Classical conditioning
2. Operant conditioning
**AO2 Application** (Match the following examples with the type of conditioning)

A tennis player experiments with different grips to enable him to serve with more topspin.  
Classical conditioned response

A netball player feels afraid when she sees her bib because she is shy and does not like team games.  
Classical conditioned response to aid anxiety

A swimmer learns to use relaxing music prior to a race to calm her nerves.  
Operant conditioning – trial and error

A golfer picks up the tee, returns his club to his bag and begins his walk down the fairway as he knows his ball has been perfectly hit  
Operant conditioning – positive reinforcement

The trampoline coach stops calling open to the gymnast as she performs a somersault  
Operant conditioning – negative reinforcement

A rugby coach brings off a player following a series of poor passes and missed tackles  
Operant conditioning – punishment

**AO3 Criticisms**

**Classical**
- Generalisation (response occurs as a result of similar stimuli), extinction (conditioned response may cease if conditioned and unconditioned stimuli are not used together) and discrimination (only one specific stimulus is used) may occur
- Association works only on reflex responses not understanding
- Many sports skills require reflex responses

**Operant**
- Selection of type of reinforcement is crucial
- Fixed mindset individuals respond poorly to failure
- Once a behaviour has been learned fully it is not necessary to reinforce all the time
- Learning through error contributes to growth mind-set

**Both**
- The theories are based on work on animals and human brains are far more sophisticated
- Conditioned responses are stored in LTM

Further research – for the original theories look up Skinner, Thorndike, Pavlov and Watson and Raynor’s “Little Albert”.
Book and website reviews by Dennis Tattoo

The Olympicchannel.com

Once registered, a simple process, the official channel of the Olympic Games is accessible to everyone. It offers a wide range of news stories and features about the history of the games and future events. Currently available are up-to-date news stories about the forthcoming winter games in Pyeongchang, as well as a series of films titled Foul Play which considers some of the more difficult times of the Olympic history.

The well-reviewed story of Margaret Lambert, born Gretel Bergmann, takes the viewer back to the 1936 Berlin Games and the exploitation of the games by Nazi Germany; it is a powerful and well researched piece and one which offers insight into some of the Sport and Society topics, most notably for 5.2.4.

Anyone interested in Olympic Games will benefit from the occasional watching of this excellent resource.

The Captain Class – Sam Walker

Walker makes the case for the importance of team captains within successful teams. He offers up teams in two tiers of sustained success and a critique of the factors commonly associated with sustained success at elite level, such as resources, quality of coaching and the assembling of talented players.

Walker contends that the leadership of the captain that is of real significance. He examines their background, psyche and qualities and offers an insight into sporting success that will be of interest to teachers and students of A Level PE alike. Captains who come under his microscope include football’s Carles Puyol, rugby’s Richie McCaw and Cuban volleyball player Mireya Luis. Indeed, it is chapter about the tactics adopted by Luis in the 1996 Olympic Games in the semi-final match against Brazil that I found the most compelling. The section on Roy Keane will be of special interest to football fans.

It is not directly linked to a specific component within the specification but would certainly underpin aspects of the psychology of leadership (4.6.1). The book is sure to prompt lively debate about the list of both the most successful teams and the captains associated with their success. Above all it is an interesting read and highly accessible.
This thought-provoking and insightful documentary opens with successful playwright and enthusiastic amateur cyclist Bryan Fogel seeking to improve his performances on the road with the help of a team of experts, including Grigory Rodchencov, the director of the anti-doping centre in Moscow. Aided by the use of banned substances, and neatly avoiding detection, Fogel improves performance levels in gruelling races whilst highlighting the limitations of the testing system.

When Rodchencov turns whistle-blower and escapes Russia, he teams up with Fogel and goes on to reveal the extent of the sophisticated state-supported doping systems in Russia, including the involvement of key politicians and the fact that doping has underpinned performances in the country for decades. It provides a fascinating insight into ethics and deviance in contemporary sport and is a wonderful resource for teachers and students alike. Setting homework of ‘Watch this film’ for unit 5.4 would be time well spent!

Icarus
Netflix
This is a new online magazine designed to support the teaching of Pearson GCE PE; especially for the 2016 specification.

If you would like to participate, please get in touch with the editorial team at insidetrackpearson@hotmail.com or teachingpeandsport@pearson.com.