Slow perception / response time

Hockey – Aerial lob

C1 – Slower Perception and Response time Aerial lob from right back to right wing:

I mentioned in B1 of the preparation phase that I was slower at receiving external cues and information from my surroundings and therefore didn’t create enough time and space to perform the skill effectively. Starting with slower perception as the first reason affecting my aerial; this comes down to information overload. When preparing and performing an aerial there are many factors to consider and to take in. Even before receiving a pass there is the task of pre-scanning, this allows me to know where the space is, where an attacker might be closing me down and where I need to pass to. Then there is the receiving of the pass and keeping possession of the ball before I perform the flick. Another thing I need to be aware of is my body position in relation to the pitch, ball and receiver. These are all the factors I should be aware of before and during the performance; however there are other stimulus around me that contribute to information overload. They are the noises of the crowd, coach, teammates but also the movement of players on the pitch which I also process in my information processing stage. This information overload is due to an unrefined selective attention process; whereas Ian Lewers has refined his selective attention to such an extent that all irrelevant information (e.g. the crowd) is filtered away, leaving him with only the necessary stimuli. Although I know what is necessary information I don’t separate the irrelevant quick enough therefore slowing the whole response time down. This slow selective attention is due to a lack of experience and practice with the skill in a game situation. This is where DCR comes in; DCR is detection, comparison and recognition. These are three stages in the information processing routine. Due to my level of experience detection is at a high standard; I can detect the external information easily with all my senses; however it is the comparison of previous experiences and the recognition of how to respond appropriately that lets me down. The last two stages require high levels of experience in game situations in order to be effective. The more experience I have of doing an aerial in different situations and under pressure the more situations I have to compare to and select a correct response. Due to my lack of experience I often use the incorrect response. This is linked with the development of schema. Schema is the suggestion that skills can be used in different sports because a performer has developed a set of general concepts allowing skills to be adapted to suit the situation. In my case doing an aerial in training (a closed environment) can be transferred to an open environment in a game.

Closely linked with this is response time. Response time is the overall result of reaction time and movement time. Reaction time is the time taken from presentation of stimulus to onset of movement, and movement time is the time taken to complete the skill. As I have a lot of stimuli to now process due to in-sufficient selective attention, my reaction time is slowed right down; which results in a rushed performance of the skill or even turn over ball. Hick’s law suggests that the relationship between number of choices/stimuli and reaction time is not linear; this proves that the more choices I have the slower reaction time. This leads me on to single channel hypothesis and psychological refractory period. Another reason I don’t get into space and pre-scan is down to processing the information I have. Information is processed through a single nerve; the brain cannot register two or more stimuli at one time. This means there is a slight delay on each stimuli; one has to wait for the other to be processed, coded as relevant or irrelevant before it can to be processed. For example, before I can process the information of me doing the correct motions to perform the aerial, I must process the information of receiving the pass and also other stimuli such as an approaching attacker. This delay results in rushed performance and therefore a faulty one.

C2 – Slower Perception and Response time Aerial lob from right back to right wing: Practice.

The corrective measures are very simple and don’t require any more equipment or expertise than a usual training session. The first corrective measure for slower perception is to train with increasing the number of stimuli and choices. This will build up the “memory bank” as it were, it will supply me with much needed experience and alternate situations; therefore when it comes to performing under pressure in a game I can detect and compare the situation and choose the best response, all from my long term memory and motor programmes. Another corrective measure is to allow time for mental rehearsal. This will prevent me from plateauing and loosing motivation, but more importantly allow me time to think about the skill and what I have to do improve.

 A corrective measure for improving response time consists of practice once again. Although it may seem overtly simple and an under-developed idea it actually does a lot more than people think. The increase in practice speeds up my decision making; the more times I perform the skill and under different situations/pressures I will react quicker to the external cues not matter what they are. With the coaches help I can also strengthen my stimulus response bond. When I perform the aerial correctly, by receiving positive reinforcement from coach and teammates, the link to the correct response becomes stronger or by contrast performing it incorrectly, receiving no feedback at all, will weaken the link to wrong response. Other ways of improving response time is improving general fitness. By doing this movement time is sped up and therefore reducing overall response time; thus allowing me to perform the aerial in less time pressure by getting into space quicker a pre-scanning. Anticipation is also an effective way of speeding up response time. There are three types of anticipation, the first one being effector. This is simply knowing how the pitch plays, anticipating the balls speed and movement. By having better effector anticipation I won’t have to concentrate on what the balls doing, but what I have to do next. The second type of anticipation is perceptual; this is slightly irrelevant at my level because it involves acquiring a prior knowledge of my opponents. I may already have this with some of the consistent opponents in my league, but I wouldn’t sit down and research them. The third and final anticipation is receptor anticipation. This is most relevant as it will allow me to pick up on subtle changes in the game for example, if an approaching attacker is going to make a tackle or just apply passive pressure. These will all speed up my response time by improving reaction and movement time.

The final corrective measure ties together all of the above. Developing schema would help improve overall performance. Schema is a theory developed by Schmidt; he suggested that the same skills can be used in different sports because a performer has developed a set of general concepts allowing skills to be adapted to suit the situation. Schema is based on experience; relating to my skill I could take the basic concepts of an aerial pass in a closed situation and transfer to a game situation. The reason I can do this is because of the similarities; it is the same skill but in a different environment. This added with practice can ensure I add variation to the aerial and apply the hockey aspects to the skill without confusing the two situations.

These are the four stages I would go through in order to develop schema during a game situation.

 Initial conditions- Information is gained from the environment

E.g. I see an attacker approaching and where the ball needs to go.

Response selections- Appropriate response is decided upon as a result of initial conditions

E.g. I use past experience to compare the situation and adjust appropriately

Sensory consequences- Player gather information to help adjust the response

E.g. I sense how far away the player is and how the pass feels

Response outcomes- Player receives information on success of skill

E.g. Using external and internal feedback, decide if it was successful or not.

Horseriding – jumping a triple fence

Jumping a Triple

C1

Cause- Response Time

When I am jumping a triple my poor response time may results in my horse and I having a fence down. This is due to several reasons. When I am approaching the fence I do not make my alterations to my stride pattern effectively. Then when I am jumping the first part of the combination I do not bring my upper body up, and then on the non-jumping stride in the combination I do not respond to the situation quick enough, for example using a half halt when covering too much ground or squeezing when I need to cover more ground.

My poor reaction time may be as a result to my information processing speed. To make a decision we have to process the information. We have to decide three main things, what skill to perform, when to perform it and at what speed to perform it. This will be dependent on the environment.

We will gain information to help us make the decision through the display. This will include both relevant and irrelevant information which will be gained through our sense organs. These are as follows…

* Vision
* Hearing
* Touch
* Kinaesthetic
* Balance

These sense organs will provide us with a lot of information and we will not be able to cope with all of this. Through the process of selective attention this information will be filtered into relevant and irrelevant information. The irrelevant information will be left and the relevant information will go on to be coded and decisions will then be made. This is known as the Detection Comparison and Recognition (DCR) Process. Detection is when the stimulus is registered by the sense organs. For example when jumping a triple my kinaesthetic feel may make me aware that my horse is backing off the fence. The comparison phase is when the mind refers the stimulus to the memory store where it will be compared to other similar stimulus. The recognition phase is when the corresponding stimulus in the memory is found and used. Once this process has been carried out decisions can be made and carried out accordingly.

All of this combined is known as the information process. Below is a model of the information process.

 Response time is the reaction time plus the movement time.

Reaction time is the time from when the stimulus is presented to the start of the movement. When I am jumping a triple and realise I am making up too much distance this will be the beginning of the reaction time. Then when I begin to do something about this for example take a half halt this is the end of the reaction time. The movement time is the time it takes to complete the movement from beginning to end. For example the time it takes me to bring my shoulder up and take a half halt. The response time is the time it takes both the reaction time and the movement time from start to finish.

There are several influences on response time. One of the main factors that affect response time is anticipation. This is why more experienced riders will be better when jumping a triple as they will be able to anticipate when they are approaching if they need to alter and they will therefore have a quicker response time than me. There are three different types of anticipation…

* Effector anticipation
* Perceptual anticipation
* Receptor anticipation

Effector anticipation is when a performer will have a feel for the way the pitch or ground is playing. For example when jumping a triple when the ground is wet an experienced rider will ride in with a more energetic bold canter to allow the horse to stand of each fence more and have more energy to push off the ground.

Perceptual anticipation is when a performer gains prior knowledge of an opponent. When I am jumping in a competition I may not be riding a horse that I am familiar with so therefor I may watch videos of the horse in previous competitions. This will enable me to become familiar with the way the horse goes, for example its stride pattern, the way it jumps and its weaknesses and strengths. This will give me an advantage when riding a horse that is quick in the air over a jump because I will be able to anticipate this and avoid making up too much ground. Prior to a competition I may also watch how other horses and riders in the competition do as well. For example, looking at their previous results, and watching their previous jumping rounds. This will enable me to make a plan of how I am going to win. For example if a person in the competition rides fast wide lines I may decide to take an inner line to try and win, or I may notice that the horses in the competition are not very careful and therefore decide to jump a slower round but try and jump clear.

Receptor anticipation is when a performer will pick up information throughout the game or competition through changes. For example when I am jumping a triple in a jumping round I may feel that my horse is tired. This will cause me to change the way I ride, for example I will need to organise my canter more to enable me to make it more energetic and less flat. Due to my poor reaction time though I tend not to notice this early enough which can sometimes result in my horse having a fence down. I may also use receptor anticipation to notice how other people are riding there jumping rounds especially the triple. For example I will be able to tell if they are taking sever half halts to bring the horse back to them, or if they are riding freely and softly into the combination if the distance is riding long.

Another factor that will affect reaction time is the single channel hypothesis. This is the theory that the brain can only process one stimulus at a time. This means that the next stimuli must wait for the pone before to be dealt with. Due to the next one waiting it causes a bottle neck at the nerve.

Diagram of the Single Channel Hypothesis

Stimulus 2

Stimulus 1

Another factor that will affect response time is the Psychological refractory period (PRP). This is based on the single channel hypothesis and suggests that if a second stimulus is presented before the first one is dealt with it will cause a delay in response. There is a delay due to the second stimulus having to way for the first one to be processed. The first one will always be processed even if it is not important or valid any more. Examples of these in sport are when a tennis ball hits the net and changes direction. Or if a rugby or football player performs a dummy. When jumping a triple an example of the psychological refectory period being present is when I feel I am approaching the first element too quickly so feel I need to take a half halt to back my horse off, this will be the first stimulus. As I am processing this and starting to move my body to do a half halt my horse backs itself off from the first element and I need to use my leg to go more forward and create energy, this is the second stimulus.

Diagram of the Psychological Refractory Period

Stimulus 1 Stimulus 2 Response 1 Response 2

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  | PRP |  |

C2

Corrective Measure- Improving Response Time

There are several ways in which I can improve my response time which will then enable me to ride a triple more effectively and successfully.

To improve my reaction time I will need to practice jumping a triple. This will help enable me to improve my anticipation and also it will improve my store of motor programmes.

I will also need to work on improving my selective attention. Selective attention is used because it is not possible to pay attention to all the information that you receive. Selective attention is the process that helps filter the necessary information from the unnecessary information to help avoid confusion and make decisions quicker. Once the information has been filtered and the relevant information is left it will then be coded. All the decisions will then be made from this. This is known as the Detection Comparison Recognition (DCR) process. The detection is when the stimulus registered by the sense organ. For example when my eye sight notices I am going to be on a close stride when I take off for the first part of the triple. The comparison phase is when I refer the stimulus to the memory store and it is then compared to other stored stimuli. The recognition phase of the DCR process is the stage where a corresponding stimulus is found in the memory. Once this process has been carried out I can make a decision.

There are several ways that I will improve my selective attention. One way that I will improve my selective attention is by my coach directing attention to key details. This is known as cueing. For example when I am jumping a triple they will direct attention to how important it is to be straight to the first part and have a good energetic canter. This will help me to remember and prioritise this and therefore be more successful when jumping a triple.

Another way to improve my selective attention is when I am training at home I will deliberately make sure that there are more distractions than there will be when I am in a competition. These distractions may be other people riding around the arena at the same time, people watching me ride, and several bright spooky things around and in the arena or music playing in the background. This will help me to begin to be able to ignore these factors and focus on the relevant ones.

Also to improve my selective attention I will use mental rehearsal. To do this I will create a mental picture of the skill to remember the actions that are associated to it. For example I will visualise jumping through a triple in slow motion perfectly. I will then clearly be able to see how each individual movement is done and at what point.

A Model of Information Processing…

**Decision Making**

When making decision we use information from the environment to try and help us decide what the best action to take is. This information is processed and the decision is made through three simple stages. They are…

The input stage is when we receive information from the environment. For example seeing that a fence is spooky or feeling that are horse is backing off from the fence. The next stage is the decision making. This is where your brain will make a decision of how to react to the certain stimuli that has been presented to the body. For example if my horse were to being back off I would think about increasing the pressure of my leg aid to encourage my horse forwards. The last stage is the output. This is when I will carry out the decision I have made. In this case I will apply more leg aid.

Another way that I will improve my response time is by practicing. This will enable me to build up and improve my store of motor programmes. A motor programme is a set of movements stored in the long term memory that specify the components of a skill. A motor unit will be formed by continued and specific practice. This means that I will need to practice jumping a triple several times to refine and build my motor programme for the sequence of the skill and how to do it correctly. The effective actions that I do will be stored in the long term memory whilst the incorrect actions will be forgotten. To ensure that I am storing a correct motor unit it is important that I have external feedback from coaches to help avoid incorrect aspects of the skill.

Practice will also help me to develop my ability to anticipate situations occurring. This is due to having past experience of similar situations. For example being able to know when the stride pattern you are on is good and you need to sit still or knowing that it is bad and needs altering in order to jump the jump successfully.

To improve my response time I will also need to improve my movement time. Movement time is the amount of time it takes from when the movement starts to when it finishes. There are several ways that I can do this. I will need to work on my overall fitness. For example muscular fitness will help my muscles to contract quicker and stronger. I will also need to work on muscular endurance to ensure that my muscles can keep contracting frequently and strongly.

For an athlete to perform to their best they need to be at their optimal level of arousal. When a performer is at optimal level of arousal their reaction times will be at their fastest. My optimal level of arousal will be lower than Scott’s due to not being as experienced as him. Optimal arousal levels may change due to various factors. For example in 1965 Zajoc that if the presence of others for example an audience increased so would a person’s arousal. Scott will be able to cope with the increase in arousal better that I will due to having the correct response reinforced. This will mean his performance will improve, known as social facilitation. Whereas when I am performing due to not being as experienced as him I do not have the correct response reinforced so my performance will therefore decrease when arousal increases too much, known as social inhibition.

Also when I am about to perform I need to ensure that I am aroused enough that I feel ready to perform and psyched up. But if I become too aroused it will affect my performance negatively. This is known as the reversal theory. To ensure I do not become over aroused I will make sure I have calming techniques to reduce my arousal. For example I may listen to calming music on an iPod.

Kayaking – choosing a line

**C1: Limited Response Time.**

Response time is the equation of reaction time added to movement time.

Reaction time is the time interval between the application of a stimulus and the detection of a response. Reaction time is influenced by many factors. When trying to find and execute a line, you need to know the route ahead, however if there is something unanticipated occurs, the paddle needs very quick reaction times to recover their line or find a new one. Fisher has very quick reaction times; alongside plenty of experience which gives him a high advantage when paddling tough water that has an uncertain line.

My response time is dependent on many factors such as the speed of my information processing and my long term memory.

The information processing model is simplified into:

The input is extracted from the display. The display provides both relevant and irrelevant information. Information is collected from the display using my sense organs: Vision, Hearing, Touch, Kinaesthetic and Balance. However, it’s impossible to pay attention to all the information I am given; therefore the information is picked up and filtered through selective attention. The relevant information isn’t filtered whereas the irrelevant information is filtered out; leaving me with only the important information needed. The relevant information is then coded and my decision on what skill to perform is based upon this information. This is known as the DCR process (Detection, Comparison, and Recognition). This is linked to the amount of experience I possess as

There are several factors that affect reaction time. One of these is experience. Fisher is much older and has been paddling much longer than I have. Both his parents also paddled, introducing him to the sport much earlier and allowing him to practice on a more regular basis; causing rapid improvements in his performance from a young age. Having a vast experience of kayaking allows him to anticipate what would happen next and how to go about changing it. There are three different types of anticipation: Effector anticipation, Perceptual anticipation and Receptor anticipation.

Effector anticipation is feeling the way the water moves and the factors surrounding it such as the turbulence and volume of water. Having had vast amounts of practice, Fisher is able to adapt his stokes to the factors of the water that may cause him difficulty.

Perceptual anticipation is gaining prior knowledge of the river. Fisher is able to do this as he scouts the river before paddling it. This is helped and maintained through sizable quantities of funding which allows him more time in the area.

Other factors that affect reaction time are aspects such as stimulus intensity. Performers tend to react faster to something that is loud or bright. In the case of kayaking, it would be something such as a big drop creating loud sounds through the volume of water. This would attract the performer’s attention and result in them changing their line or stopping to scout ahead.

Gender is also a contributing factor to reaction time. Men generally have faster reactions, meaning Fisher would have faster reactions than I have; however, men tend to lose their reaction speed at a faster rate. With both genders, age reduces reaction time. Fisher is currently 38; meaning his reaction time would begin to deteriorate, however, it is also dependant on the other factors.

Fisher’s fitness is also very high. Fitness is the ability to cope with the individuals day to day demands. He has a low heart rate and a high stroke volume helping him to cope better with more demanding movements as his body is able to get the oxygen to the muscles faster. This helps improve his reaction time as his muscles are able to react quicker and produce a faster contraction reducing the reaction time. When Fisher reaches an obstacle that may cause him difficulty, his fitness with help to his ability change his line and reduce the chances of becoming stuck in or at the obstacle.

Hicks Law states that the more stimuli there are the longer it will take to choose the correct response. As kayaking is in an open environment it is very susceptible to change, it will on many occasions throw more than one stimuli at the performer. The single channel hypothesis also affects the reaction time of the performer. Stimuli are processed along a single nerve; meaning the brain can only process one stimulus at a time. Meaning the second stimulus has to wait before begin processed causing a bottle neck at the nerve. If a second stimulus occurs before the first stimulus has been fully processed and unavoidable delay will occur. This delay occurs because the second stimulus has to wait for the first to be processed even if it isn’t valid anymore. The psychological refractory period is used to create time for the performer to deal with the first stimuli before the second is present.

**C2: Improving Response Time.**

Response time = Reaction time + Movement time. To improve my response time, I must improve both reaction and movement time; this can be done in a variety of ways.

There are several different ways to improve a person’s response time. The first of many is refining selective attention. This is done through concentrating on one stimuli at a time, and only relevant stimuli; reducing the amount I would have to focus on, allowing the processing to have a smaller queue. This would be effective in kayaking as I would be able to filter out the irrelevant information and focus on the particular stimuli which may affect my performance.

Another method of improving reaction time is through practicing reacting to the stimulus. In my case this can only be done through paddling more white water and trying to maintain my lines. This would be really hard to do; as to go kayaking we have to travel vast distances, reducing the amount I am able to do. Fisher is able to do this easily as he has the time and money to be able to travel the distances he needs to practice.

Improving my physical fitness would also improve my movement time; consequently increasing reaction time. (Reaction time + movement time = response time). This could be done through a series of forms of training. For example, I could use plyometric to increase my strength and speed of my strokes, allowing me to use less strokes to apply the same amount of power. Therefore when I choose a bad like, my speed of my strokes will help my response time to be faster. I could also use other forms of training such as altitude training to improve my VO2 max; allowing me to use the oxygen I breathe in more efficiently resulting in me wasting less energy on respiration and inspiration is an active process.

I could also improve all forms of anticipation when paddling. For example, I could gain better understanding and knowledge on how to react in different water levels. This would improve my effector anticipation and increase my response time. It would also help my perceptual anticipation as I would increase my prior knowledge of the water levels and turbulence, allowing me to focus on the mist effective strokes to use in each situation.

Mental rehearsal is also an effective way of reducing response time as I, as the performer would already have gone through what I would do and how I would perform when in a situation such as losing my line. This would have to be done when scouting ahead as different river have different lines, preventing mental rehearsal of a particular river. However the small amount of mental rehearsal I will be able to gain of a particular river, or a river I have paddled before will stimulate my brain and muscles, helping my response to be more dominant that it was prior to the mental rehearsal. I can also mental rehearse in general for situations such as a larger volume of water. I would be able to vision myself applying a stronger stroke or paddling faster to help me past/through the water.

It would also be helpful it I was at my optimal arousal level. (In detail in “High Brace” section). This would reduce the amount I panic or experience the symptoms of over or under arousal. These are symptoms such as sweaty palms or dizziness when paddling. This can be controlled through a variety of techniques such as self-talk, imagery and biofeedback.