

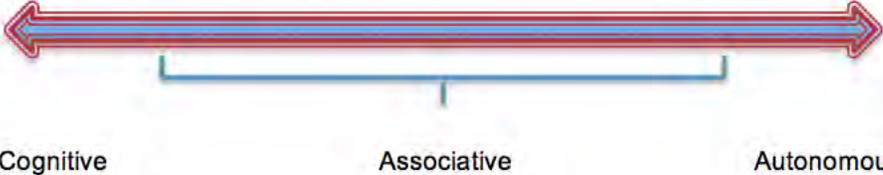
## HSC Core 2: Factors Affecting Performance

How does training affect performance?

Learn About	Learn To	Study Notes								
<ul style="list-style-type: none"> <li>· <b>energy systems</b></li> <li>- alactacid system (ATP/PC2)</li> <li>- lactic acid system</li> <li>- aerobic system</li> </ul>	<ul style="list-style-type: none"> <li>· analyse each energy system by exploring:               <ul style="list-style-type: none"> <li>– source of fuel</li> <li>– efficiency of ATP production</li> <li>– duration that the system can operate</li> <li>– cause of fatigue</li> <li>– by-products of energy production</li> <li>– process and rate of recovery</li> </ul> </li> </ul>	<p><b>Energy systems</b></p> <p>Energy systems provide the energy required by muscles for movement. The three main energy systems are:</p> <ul style="list-style-type: none"> <li>- <b>Alactacid system (ATP/PC)</b>- anaerobic based system that does not require oxygen to generate energy.</li> <li>- <b>Lactic acid system</b>- anaerobic based system that does not require oxygen to generate energy.</li> <li>- <b>Aerobic system</b>- aerobic based system that requires oxygen to generate ATP and energy.</li> </ul> <p><b>Alactacid system (ATP/PC)</b></p> <table border="1" data-bbox="1122 794 2024 1321" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #d9e1f2;">Energy Systems</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d9e1f2;"></td> <td style="background-color: #fff2cc;">Alactacid System or AT/PC</td> </tr> <tr> <td style="background-color: #d9e1f2;"><b>Process of how energy is created and used</b></td> <td>An explosive movement causes the ATP molecule to 'split', providing energy for muscular contraction. Once reformed, ATP can break down again — and so the process goes on.</td> </tr> <tr> <td style="background-color: #d9e1f2;"><b>Fuel</b></td> <td>About 90 grams of ATP in our body. This is sufficient to power the muscles required in one explosive movement such as a jump, start or throw. That equates to one to two seconds of hard work.</td> </tr> </tbody> </table>	Energy Systems			Alactacid System or AT/PC	<b>Process of how energy is created and used</b>	An explosive movement causes the ATP molecule to 'split', providing energy for muscular contraction. Once reformed, ATP can break down again — and so the process goes on.	<b>Fuel</b>	About 90 grams of ATP in our body. This is sufficient to power the muscles required in one explosive movement such as a jump, start or throw. That equates to one to two seconds of hard work.
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		<p><b>Resistance training</b>  Bigger gains in strength are made as resistance is progressively increased. If training for absolute strength, the threshold is represented by a high resistance or load ensuring that only a few repetitions can be completed. If training for strength endurance, the threshold is represented in terms of quantity, with a high number of repetitions being required to effectively challenge the threshold.</p> <p><b>Warm up and cool down</b>  A warm up is the process whereby an athlete goes through a range of exercises in order to get their body ready for competition or training. Warm up exercises move from low intensity to high intensity and from general movements to sport specific movements.  The purpose of the warm-up is to:</p> <ul style="list-style-type: none"> <li>- Reduce the risk of injury or soreness by increasing joint mobility and muscle stretch</li> <li>- Increase body temperature and enzyme activity to promote faster and more powerful muscle Contractions</li> <li>- Mentally prepare the athlete for training</li> <li>- Stimulate the cardiorespiratory system.</li> </ul> <p>Cool downs are essentially the opposite of a warm up. They involve movements that help speed up recovery and enable the body to slowly adjust its systems and bring the body back down to rest. The purpose of the cool-down is to minimise the muscle stiffness and soreness that could result from a strenuous training session. Stretching as part of the cool down helps lengthen the muscle and can assist in avoiding some stiffness experienced after physical activity.</p> <p><b>Aerobic</b>  Before aerobic training a warm up should go for 10 min and aim to increase the heart rate to the 70% MHR aerobic threshold slowly. Movements should progress from lower intensities to the higher one and from general movements such as a jog or star jump to more specific movements such as running with a ball at their feet for soccer. Movements could also include a small 5-on-5 mini game.</p>
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		<p>Optimal arousal is required for athletes to perform their best. Arousal is different to anxiety as it is a physiological response similar to getting excited before an event. Arousal is about getting ready for action and often causes an increase in heart rate and blood pressure as well as heightened neural activity. It is often referred to as being “in the zone” or “psyched up.” It is about waking your body up so that it is ready to perform. Arousal can be both positive and negative for performance, depending on the level and the type of performance.</p> <p>High intensity contact sports have a higher optimal arousal level than low intensity non-contact sports. This means that a rugby league player requires a higher arousal level than an archer or gymnast. The rugby player will not perform as well if his arousal is not high enough, or is too high. This is the same for the archer; if her arousal levels are too high or low she will not perform as well. That is to say, there is an optimal arousal level, which is specific to each sport.</p> <p>With respect to specific skills, the more difficult the skill (handstand) the lower the levels of arousal needed, while the easier the skill (catching a large ball) the higher the level of arousal. Under arousal is characterised by lethargy and a lack of motivation, while over arousal is characterised by an inability to focus. This optimal arousal level is often depicted as an inverted-U on a graph.</p>
<ul style="list-style-type: none"> <li>• <b>cal strategies to enhance motivation and manage anxiety</b></li> <li>- concentration/attention skills (focusing)</li> <li>- mental rehearsal/visualisation/imagery</li> <li>- relaxation techniques</li> <li>- goal-setting.</li> </ul>	<ul style="list-style-type: none"> <li>- research case studies of athletes from different sports and ascertain the nature of their motivation and the psychological strategies they employ</li> </ul>	<p><b>Psychological strategies to enhance motivation and manage anxiety</b></p> <p>There are many psychological strategies to enhance motivation and manage anxiety that athletes use. They are often done before competition to help the athlete release nerves and focus on the task they are about to perform. Psychological strategies to enhance motivation and manage anxiety can also be used within competition during moments of high pressure. Such moments include free throws in basketball, taking a penalty shot in football, or a conversion in rugby.</p> <p><b>Concentration/attention skills (focusing)</b></p>

Learn About	Learn To	Study Notes
<ul style="list-style-type: none"> <li>• <b>stages of skill acquisition</b></li> <li>- cognitive</li> <li>- associative</li> <li>- autonomous</li> </ul>	<ul style="list-style-type: none"> <li>• examine the stages of skill acquisition by participating in the learning of a new skill, eg juggling, throwing with the non-dominant arm</li> </ul>	<p><b>Stages of skill acquisition</b></p> <p style="text-align: center;">Stages of Skill Acquisition Continuum</p>  <p>There are three stages of skill acquisition that sit along a continuum of skill learning. The cognitive stage is characterised by frequent errors and is the stage when the learner has to think a lot about the skill and how to execute it. They also require lots of frequent feedback.</p> <p>The associative stage is the largest and longest stage. It is characterised by lots of practice. As the athlete progresses towards the next stage errors become less frequent and smaller.</p> <p>The final stage is the autonomous stage. This stage is characterised by few if any errors that are minor. An athlete at this stage of skill acquisition can think about other aspects of competition and not think at all about the skill itself.</p> <p><b>Cognitive</b></p> <p>The cognitive stage of skill acquisition is characterised by mental processes and the athlete thinking about the skill. The athlete at this stage needs to think about their body position, which muscles they are contracting and what the movement should look like. The athlete is thinking about what they are doing at each section of skill execution, resulting in a non fluid movement.</p> <p>Athletes at this stage have large frequent errors and have a robotic jerky movement. Such an athlete may miss the ball that they are attempting to kick completely, or kick it backwards instead of forwards. Try and visualise a toddler learning to walk, or a 3 year old</p>

## Massed and distributed practice

**Massed** practice involves a continuous practice session, with the rest intervals being shorter than the practice intervals.

Massed practice is a continuous practice session, with smaller rest periods than practice intervals and works well for skilled and motivated athletes. Massed practice suits skills that are exciting or frequently used in performance, such as uneven bar transitions, or passing in football.

An example would be a gymnast learning a handstand, where drilling continues until fatigue or other factors make further practice of limited benefit.

Massed practice works best when performers are:

- Highly motivated
- fresh
- Unable to attend a number of sessions.

**Distributed** practice (or spaced practice) involves a broken practice session, with the intervals of rest or alternative activities being longer than the practice intervals.

Distributed practice has short periods of practice with longer breaks from the skill rehearsal, which can be rehearsal of another skill or a break for feedback. It is often used for less skilled and less motivated athletes and is helpful in teaching boring skills, such as passing a basketball. This practice method can also be used for the more difficult skills that need to be broken up, or when lots of feedback is necessary.

Distributed practice works best when:

- The performer lacks interest
- The task is difficult
- Motivation is low
- the task causes fatigue
- Excessive work causes discomfort (for example, heading a soccer ball).

- The performer has less chance of sustaining injury during execution of the movement.
- Good technique is fundamental to achieving at the higher level.

## Objective and subjective performance measures

Objective and subjective performance measures are used to classify the various different types of performance measures.

**Objective** performance measures are independent of the observer. That means the measurement is done using something other than the person observing. This independent measure can include: a stop-watch, measuring tape or record of goals. The objectivity of the performance measure is increased through measures such as: time, checklists, or established criteria.

In contrast **subjective** performance measures are dependent on the observer and based on opinions, feelings, and general impressions. Subjective measures rely more on the observer than independent measures. Sports such as dance and gymnastics are more subjective than objective in their measures.

Sports such as high jump use completely objective performance measures of metres and centimetres, while diving tends to use more subject performance measures. Skills are often measured using both, such that a soccer player's performance. It was good because it looked good, felt smooth, but also he covered 12Km in the game, made 30 tackles, had 98% success in passing and 85% success in shots, and scored 3 goals in the game.

**TABLE 8.3** Objective versus subjective appraisal

Activity	Objective assessment	Subjective assessment
Basketball	The throw for goal went through the basket.	The offence scored as a result of poor positional play by the defence.
Gymnastics	The gymnast scored 7.0 on the floor routine.	The floor routine lacked creativity.
Swimming	She completed the 50 metre race in 32.7 seconds.	Her slower time was caused by a faulty bilateral breathing technique.

**FIGURE 8.30** A subjective observation of a movement performance

