Sanderson

Sport Psychology

Chapter 6: Arousal and Anxiety

Outline

1. Understanding Arousal and Anxiety

-Arousal: a blend of physiological and psychological activity, or the level of alertness in a given situation.

-Very low and very high levels of arousal can be detrimental to performance.

-Stress: an imbalance between the demands of the situation a person is in and their beliefs about their ability to cope with that situation.

-Stress reactions result when stressors occur, and we respond both physiologically and psychologically, based on our interpretation of the event.

-Stress reactions can be influenced both by aspects of the situation and aspects of the person.

-Moderate levels of stress can increase arousal and provide energy, and can help performance.

-Anxiety: a feeling of nervousness and worry.

* 1. Physiology of Arousal

-The fight-or-flight response: People are normally in a state of equilibrium called homeostasis. When a person is threatened, energy is shifted from the nonessential body systems to those systems necessary to respond to the challenge, either by fleeing or fighting.

-The hypothalamus activates both the sympathetic nervous system and the endocrine systems. The adrenal glands release epinephrine and norepinephrine. This increases heart rate, blood pressure, and breathing rate. The pupils widen, and blood flows toward the muscles.

-The pituitary glad releases adrenocorticotropic hormone (ACTH), which causes the adrenal glands to produce glucocorticoids, or steroid hormones, such as cortisol. This helps protect the body from injuries.

* 1. Psychological Arousal

-There are both positive (exhilaration or excitement) and negative (anxiety) feelings of arousal.

* + 1. Trait Versus State Anxiety

-Trait anxiety describes a behavioral disposition, or personality dimension, in which people generally react anxiously, even in situations that should not be anxiety provoking.

-State anxiety is caused by a given situation and is temporary. The five factors that lead to an increase in anxiety in anticipation of an achievement situation are fear of performance failure, fear of negative social evaluation, fear of physical harm, situation ambiguity, and disruption of well-learned routine.

* + 1. Cognitive Versus Somatic Anxiety

-State anxiety can be broken down into cognitive anxiety and somatic anxiety.

-Cognitive anxiety describes anxiety the results from thoughts or concerns.

-Somatic anxiety describes the perception of physiological responses to stressful situations, such as racing heartbeat, faster breathing, or feelings of nausea.

-Cognitive anxiety (precompetitive cognitive anxiety) tends to be relatively high as a competitive even t approaches, and typically stays high right up until the event begins. During the event, cognitive anxiety may fluctuate, depending on how the even is going.

-Somatic anxiety (precompetitive somatic anxiety) tends to be relatively low, but then climbs rapidly, starting about 24 hours before the event starts.

* + 1. Primary Versus Secondary Appraisal

-Transactional model: describes how people interpret or appraise a particular event is a more important predictor of the experience of a stressful event than the actual event (Lazarus & Folkman, 1984).

-Primary appraisal: people interpret the situation and what it will be for them (“Am I in danger?”).

-Secondary appraisal: people assess the resources available for coping with the situation (“What can I do about this?”).

-A more positive interpretation of the situation leads to better performance.

-A study by Moore, Vine, Wilson, & Freeman (2015), showed that people who were told that arousal had positive effects on performance did much better on a putting task than those who were not given this information.

1. Measuring Arousal and Anxiety
   1. Self-Report Measures

-Commonly used by sport psychologists, researchers, and coaches to measure athletes’ level of arousal, anxiety, and stress.

-The Sport Competition Anxiety Test: this scale is a reliable measure of trait anxiety, and can be used with both adult and child athletes.

-The Sport Anxiety Scale-2 (SAS-2) and the Cognitive Somatic Anxiety Questionnaire (CSAQ) assess the level of trait anxiety.

-The Competitive State Anxiety Inventory-2 measures cognitive anxiety, somatic anxiety, and a related compound, self-confidence.

-Advantages: Self-report tests are easy to complete (provide data from large samples of athletes), and the measures provide numerical, objective data (easy to score). Self-report measures also provide information that in some cases can only be learned by asking the athlete.

-Disadvantages: Sometimes athletes deliberately don’t answer the questions honestly. Measures require large samples of data in order to reliably predict how anxiety is correlated with performance. Also, some measures are relatively long, and can take considerable time to complete.

* 1. Behavioral Measures

-Observe outward manifestations of anxiety or stress, such as fidgeting, heavy breathing, rapid heart rate, or nausea.

-Can be used to avoid self-report problems (admitting feelings anxious).

-Advantages: Fast; measures can be acquired through observation, without the use of questionnaires.

-Disadvantages: Athletes may attempt to control their behavioral indicators, and therefore feel more anxiety than they are appearing to show. Also, different people show signs of anxiety in different ways, and the anxiety an athlete reports feeling may not match physiological indicators of such arousal.

c. Physiological Measures

-Levels of anxiety can be measured through various measures of physiological arousal, including heart rate, blood pressure, breathing rate, muscle tension, and skin conductance.

-Biochemical measures: The presence of norepinephrine, epinephrine, and cortisol can be detected in blood or urine tests.

-Brain activation: Use of an EEG (electroencephalography), which measures brain waves, and functional magnetic resonance imaging (fMRI) technology, which provides information on blood flow to specific areas of the brain, can be used to measure anxiety.

-Advantages: Avoids the problems of social desirability and misreporting, and it’s almost impossible to deliberately produce false data. Also, data can be collected during athletic events, measuring actual responses.

-Disadvantages: Some people find the use of EEG and fMRI themselves very stressful, and this can increase their anxiety levels even more. Also, physiological measures can be influenced by factors other than stress, including gender, weight, and overall physical health. High levels of arousal can indicate positive feelings. Lastly, the use of these measures is expensive and time consuming, and requires trained technicians.

**Focus on Neuroscience: How Brain Activity Can Differentiate Professional Versus Amateur Athletes**

**-Researchers asked amateur and professional golfers to imagine trying to hit a ball to a specific hole 100 yards away. Their brains were scanned with an fMRI while they were imaging this hit. The professional golfers showed brain activation in parts of the brain that involved planning and carrying out specific motor actions. The amateur golfers showed activation in parts of the brain that are involved in experiencing fear and anxiety.**

1. Understanding the Arousal/Anxiety-Performance Link
   1. Drive Theory

-As arousal increases, so does performance (Hull, 1943, 1951; Spence, 1956).

-In this model, arousal is usually caused by situational factors, but the model does not distinguish between somatic and cognitive anxiety.

-Athletes’ skill level influences the association between arousal and performance. Athletes who are new to a skill or sport will generally perform better under conditions of low arousal. Experienced athlete will generally perform better under conditions of high arousal (Performance = Habit X Drive [arousal]).

-In a study by Jackson, Buglione, & Glenwick (1988), MLB players who were being traded showed lower batting averages and slugging percentages before the trade compared to their averages in the three prior years, and after the trade, players showed positive effects of being traded on both measures, which were maintained over the next year.

-Keep in mind that correlation does not equal causation!

* 1. Social Facilitation Theory

-Extends drive theory by specifically describing how the presence of other people can create arousal. People who engage in a task in front of others experience higher levels of arousal than those who are by themselves, and this arousal can have different effects on performance depending on how good a person is at a particular task.

-If you are good at a task, arousal will lead you to perform even better. If you are not so good at a task, arousal may lead to worse performance.

-Norman Triplett’s observations and experiment (also mentioned in chapter 1).

-Explanations: Why does the presence of others facilitate performance on easy tasks?

-If we are performing an easy task, distraction from other people doesn’t have an impact on performance task (Baron, Moore, & Sanders, 1978; Huguet, Galvaing, Monteil, & Dumas, 1999). However, if we are performing a complex task, the distraction from other people may make it harder to concentrate, which in turn impairs performance.

-OR, the mere presence of people may be energizing. Home teams do better than visiting teams (Jamieson, 2010); home teams in the NBA and MLS have a greater than 60% chance of winning (Moscowitz & Wertheim, 2011).

-OR, knowing that you are being evaluated or judged by others may be the real cause for difference in performance. Worringham & Messick (1983) found that runners are faster when a person is specifically watching their performance than when a person is present but is facing away from them and hence can’t evaluate their speed.

-Choking

-The presence of supporting audiences can sometimes lead to worse performances, especially in high pressure situations where expectations are high.

-NBA players are less accurate in free throws than their average when taking shots when their team is behind only by one point in the final minutes of the game (Worthy, Markman, & Maddux, 2009).

-Soccer teams who lost their last shootout in an international tournament score fewer goals in the next game than teams who won their last shootout or didn’t have a shootout (Jordet, Hartman, & Vuijk, 2011).

-High pressure situations cause anxiety, which in turn seem to disrupt athletes’ ability to execute necessary skills.

-Professional tennis players who will be evaluated by tennis experts and compared to other athletes’ performance are less accurate in their serves (Englert & Oudejans, 2014).

-The presence of a supportive audience (and their presumably high expectations), is especially likely to lead to worse performance on difficult or unfamiliar tasks.

-Butler & Baumeister (1998) found that students taking a math test in front of a friend, rather than a stranger, felt less stress, but actually made more errors and took longer to complete the test.

-Home teams tend to have a higher winning percentage than away teams, BUT home teams play especially poorly under high pressure situations (Baumeister & Steinhilber, 1984; Schlenker et al., 1995a, 1995b).

-Athletes who are high in fear of negative evaluation are even more likely to “choke” under pressure (Mesagno, Harvey, & Janelle, 2012).

**Research in Action: Why-and When-Do Homes Teams Choke?**

**-Goldman & Rao (2012) examined NBA statistics over six basketball seasons (2005 to 2010). The researchers examined both free throws and offensive rebounds.**

**-Of the 300,000 free throws that were examined, home players had a slightly higher percentage of shots made than away players. However, when the games were close, home players showed a 2% drop in their overall free throw percentage, even lower than the average percentage of away players, whereas away players showed no change. Players who were overall worse at shooting free-throws showed an even greater drop in performance, meaning a stronger “home choke” effect.**

**-Of the 1.3 million possessions in the last eight minutes of the game, if the game was basically settled, there was no difference in rates of rebounding for home versus away players, but for close games, home players had more rebounds (33%) and away players (29%).**

**-The home crowd is generally quiet when their players shoot free throws, which could make players more self-conscious and thereby disrupt performance.**

* 1. Inverted U Theory

-High arousal is associated with increased performance, but only up to a point. Performance is lowest when arousal is very low (boredom) or very high (anxiety), and highest when arousal is at a moderate level.

-The Inverted U describes arousal as caused by situational factors, and does not distinguish between cognitive and somatic anxiety.

-The ideal level of arousal for peak performance may also depend on the particular sport and the skills it requires.

-An athlete’s skill level may also impact the level of arousal necessary for peak performance (a younger or more inexperienced the athlete may benefit more from lower levels of arousal, whereas an athlete capable of performing at a very high level may benefit more from higher levels of arousal).

* 1. Extensions of Inverted U Theory

-Multidimensional anxiety theory

-Somatic and cognitive anxiety influence performance in different ways. Peak performance occurs at a moderate level of physiological arousal. However, cognitive state anxiety is negatively associated with performance, meaning that peak performance occurs at low levels of worry.

-Burton (1988) found that when examining collegiate swimmers, cognitive state anxiety was associated with lower levels of performance, whereas somatic state anxiety was associated with decreased performance at both high and low levels, but with increased performance at moderate levels.

-This model assumes that somatic and cognitive anxiety have independent and separate effects on performance.

-Catastrophe model

-Proposes an interaction between he effects of somatic and cognitive anxiety on performance.

-The inverted U model best describes the influence of physiological arousal on performance for people at levels of low cognitive anxiety.

-When performance pressure is low, gradual increases in arousal will improve performance up to a point, and then interfere with performance. When performance pressure is higher, and an athlete experience moderate or high cognitive anxiety, greater physiological arousal even at a moderate level can lead to a “catastrophe”, meaning a sudden and substantial drop in performance.

-Relatively little empirical research has examined this overall model. Some extension of the model do show support.

-Reversal theory

-Proposes that arousal and anxiety may have different effects on performance for different people.

-Arousal impacts performance differently depending on how a person thinks about or interprets that arousal.

-Kerr & Males (2010) studied a team of elite lacrosse players who lost all four games at a world championship tournament. Lots of circumstances that could have been seen in a positive light were instead viewed in a negative light, which in turn may have contributed to overall poor performance.

* 1. Individual Zone of Optimal Functioning (IZOF) Theory

-The level of arousal (or anxiety) that leads to peak performance differs for different athletes-each athlete has an optimum level of arousal (or the “individualized zone”) in which their best performance occurs.

-Research with collegiate, Olympic, and professional athletes generally finds support for the IZOF model.

* 1. Flow

-Flow is a positive state in which a person feels a balance between the challenges of the situation and their skills to cope with these challenges.

-Athletes who are in a state of flow experience a very positive state, in which they are fully absorbed in their performance, have no sense of time passing, and achieve positive results.

-Studies show that athletes who are in a state of flow show better performance, and flow is associated with higher level performance in team sports, but being in a state of flow does not guarantee outstanding performance.

-Bakker et al. (2011) found that a team of elite young soccer players reported higher levels of flow in games when there was a win or tie, and also that players who received positive feedback and support from the coach during the game reported higher levels of flow, which resulted in more positive performance ratings by both athletes and the coach.

-Flow can be achieved by mental and physical preparation, self-confidence, focus, positive attitude, and motivation. Athletes may vary in their ability to achieve flow. Athletes who are intrinsically motivated are more likely to experience flow. Optimism and hardiness may also be a factor in flow.

-More experienced athletes, who are able to rely on automatic processing to perform, are more likely to achieve flow. Learning a new sport or skill takes considerably effort, and the intense concentration makes it nearly impossible to achieve flow.

-Research is correlational-and the flow-performance link is not known. Athletes experiencing flow may actually perform better, or perhaps playing well makes athletes feel as though they are in a state of flow. Another possibility is that there is a third variable, such as training, quality of coaching, or personality. The mere pursuit of flow may be as beneficial as actually achieving a flow state.

**Impact on Youth: The Confidence-Flow Link**

**-Koehn, Morris, & Watt (2013) examined the link between confidence and flow in young athletes. They asked junior tennis players (ages 12 to 18) to complete measure of both confidence (before training or tournament events) and flow (within one hour after finishing a match during a tournament). Athletes who were higher on confidence were more likely to experience flow.**