

CASE TEACHING NOTES for The 2000 Meter Row: A Case Study in Performance Anxiety

by

Douglas Post

Department of Family Medicine

Ohio State University

INTRODUCTION

This case is based upon another case in the National Center for Case Study Teaching in Science case collection, “The 2000 Meter Row,” by Nathan Strong (see <http://www.sciencecases.org/crew/crew.asp>). Whereas that case emphasized the physical performance during a rowing competition, I have modified it to focus on psychological factors.

Excessive arousal and performance anxiety can have a debilitating effect on athletic performance.^{1,2} This can also be true in non-athletic situations, such as the performance of students on tests and class presentations. I presented this version of the case in a class on arousal and athletic performance as part of a course titled “Sport Psychology.” The class consisted of 25 to 30 students, about two-thirds undergraduate, one-third graduate students. Students were primarily physical education, education, and psychology majors. The instructor brought in guest lecturers to talk on various sport psychology topics, and I was the guest “lecturer” for the class on “Arousal and Athletic Performance.” The session lasted for 1 hour and 45 minutes.

Objectives

1. To increase understanding of the constructs of arousal and anxiety.
2. To differentiate between state and trait anxiety.
3. To introduce six theories from psychology on the arousal-performance relationship.
4. To address three psychological interventions to help reduce anxiety and improve performance.

MAJOR ISSUES

The major issues covered in class are tied to the case objectives:

1. Arousal is defined as a continuum that includes both physiological and psychological activation, ranging from drowsiness/sleep to a psyched-up, hyperactive state. Anxiety is defined as a maladaptive emotional state that is typically associated with heightened arousal and the interpretation of a situation as threatening and/or dangerous.³
2. State anxiety is a situational form of worry and apprehension. The intensity of state anxiety is commensurate with the strength of the cue that elicits the anxiety. Trait anxiety is a more enduring form of anxiety, reflecting a broad, generalized proneness to this emotion.⁴

3. Arousal-performance theories include:

1. *Drive Theory*: P (performance) = H (habit) \times (times) D (drive). This theory hypothesizes that performance is a function of the repetition of a habit (level of skill learned) and the drive or arousal with which that skill is performed. That is, a high level of arousal will positively impact performance when the skill is performed by a proficient learner, but will negatively influence performance when the learner is a novice.⁵
2. *Inverted U Hypothesis*: This theory proposes a curvilinear relationship between arousal and performance, such that increases in arousal have a positive effect on performance up to a certain point, after which continued increases in arousal detrimentally affect performance. A moderate degree of arousal is optimal.^{6,7}
3. *Individualized Zone of Optimal Functioning*: This theory suggests that there is substantial individual variability in arousal–performance relationships. Thus, some athletes perform best under conditions of high arousal, some when arousal is moderate, and some when it is low. To maximize performance, an athlete needs to find his/her optimal level of arousal.⁸
4. *Multidimensional Anxiety Theory*: This model theorizes that anxiety is not a unidimensional construct, but rather is composed of two distinct subcomponents, cognitive anxiety and somatic anxiety. The cognitive dimension refers to negative expectations about an upcoming performance, inability to concentrate, and disruptions in attention. Somatic anxiety refers to perceived physiological arousal, including elevated heart rate, fast-paced, shallow breathing, and cold, clammy sensations in one’s extremities. The theory hypothesizes a powerful negative linear relationship between cognitive state anxiety and performance and a less powerful, inverted U relationship between somatic anxiety and performance.⁹
5. *Catastrophe Theory*: This is a variant of the inverted U hypothesis, which predicts that an increase in arousal beyond an optimal point leads to a symmetrical, orderly decline in performance. The inverted U model suggests that a slight increase in arousal will lead to a slight deficit in performance. Catastrophe theory proposes that when an athlete goes beyond the optimal point, a large and dramatic decline in performance ensues, a “catastrophe” from which it is very difficult for an athlete to recover.¹⁰
6. *Reversal Theory*: This theory emphasizes the individual’s interpretation of the anxious state, and is similar to the individualized zone theory in highlighting individual variability. What is an extremely unpleasant level of arousal for one individual may be very positive for another, and it’s the interpretation of the situation that produces the difference. Reversal theory is similar to cognitive theory, as developed by Albert Ellis. Ellis’s ABC model posits that an activating event (A) is interpreted by an individual’s belief system (B) that in turn leads to emotional consequences (C), depending on the nature of the interpretation. This individual interpretation is subject to change or reversal, and it is the potential shift in the interpretation of the situation that gives the theory its name.¹¹

4. Psychological interventions to reduce anxiety include:

1. *Cognitive Approaches*: The cognitive set of techniques is based on the premise that certain patterns of thinking directly cause difficulties with performance anxiety, as when Jim’s thoughts about disappointing his team and best friend (beliefs) lead to feelings of dejection (emotional consequences). When these thought processes are modified (i.e., negative to more positive, unrealistic to more realistic), performance is subsequently improved.¹²

2. *Progressive Muscle Relaxation*: PMR is based on alternating states of tension and relaxation to help improve kinesthetic awareness of these differing states, and to help induce a state of relaxation through a rebound effect.¹³
3. *Cue-Controlled Relaxation*: CCR is a combination of diaphragm breathing and use of a cue word to induce relaxation. PMR and/or diaphragm breathing can be used to initially create a relaxed state. Then, while in a state of relaxation, an individual says a “relaxing” word to oneself, such as the word “calm.” The pairing of the word and the relaxed state leads to the word developing properties of associated relaxation over time.¹⁴

CLASSROOM MANAGEMENT

The class in which this case was taught covers arousal. It is generally the third or fourth session in a 10-week quarter. Prior to class, students are assigned three chapters to read in the text by LeUnes and Nation ([ref. 1](#)): “Anxiety and Arousal,” “Anxiety Reduction: Classical Conditioning and Operant Learning,” and “Anxiety Reduction: Cognitive Learning Techniques.” In the past, I have used the text by Horn ([ref. 2](#)) and had students read the chapter in it on “The Arousal-Athletic Performance Relationship: Current Status and Future Directions.” At the beginning of class, the case is read aloud to the students. At the end of the reading, they are told that the case discussion will focus on helping Jim understand what happened to him and the interventions that a sports psychologist might propose.

As an ice-breaker, I ask the class to share a story of an experience they may have had that is similar to Jim’s story. I also state that this could be a way of helping Jim to normalize his experience. I have two to four students tell the class about personal experiences they have had with performance anxiety in a sport. I also share a personal experience I had with golf when I was 16. This usually takes approximately 5 minutes.

After this, inform the students you would like them to think of themselves as the sports psychologist in the case, as the person to whom the coach referred Jim for services. State that the first step that often occurs in the initial visit with a sports psychologist is a thorough psychological assessment, in order to determine the source of the athlete’s difficulties. Tell the class that this evaluation is often theory-based. State that in order to help Jim, you will review six theories on the relationship between arousal and performance and you would like the class to determine which of these theories best fits Jim’s situation. As each of the theories is reviewed, inform the class that you would like them to think of what kinds of questions they would ask Jim when there was important information missing in order to make a full analysis of the case.

To set the stage, state that you would like to review the constructs of arousal, anxiety, state anxiety, and trait anxiety. Place each term on the blackboard, and ask the class to point to details in the case that, if possible, illustrate each of these constructs. Did Jim have state and/or trait anxiety (see the [Answer Key](#))?

When this is completed, place the term “drive theory” on the blackboard. Provide a definition of drive theory to the class, draw a diagram, and ask the class how the case fits or does not fit with drive theory. Next, examine the remaining five theories following the same procedure. A list of hoped-for outcomes is given in the [Answer Key](#).

At the end of this activity, I address with the class the types of interventions that a sports psychologist could use in this situation. Following reversal theory, I start with techniques of cognitive modification. I ask the class to point to Jim’s thoughts in the case that contributed to his anxiety and then ask them to

point to thoughts that led to a positive shift in performance. I state that teaching Jim about these thinking-performance relationships would be an effective strategy to employ in this case (see [Answer Key](#)).

To close, I teach the class an abbreviated version of a combined PMR and CCR. We focus on four muscle groups with PMR and conclude with a diaphragm breathing CCR, suggesting the students say the word “calm” to themselves with each relaxed exhalation. The goal is for students to personally experience relaxation and for students to leave the class in a relaxed state.

ANSWER KEY

Answers to the questions posed in the case study are provided in a separate answer key to the case. Those answers are password-protected. To access the answers for this case, go to [the key](#). You will be prompted for a username and password. If you have not yet registered with us, you can see whether you are eligible for an account by reviewing our [password policy and then apply online](#) or write to answerkey@sciencecases.org.

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Acknowledgements: Development of this case study was made possible in part by a grant from The Pew Charitable Trusts.

Date Posted: 10/06/03 nas

Originally published at http://www.sciencecases.org/crew_anxiety/crew_anxiety_notes.asp

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