

The Stress Process in Physical Education

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The first step to reducing student stress in physical education is to understand where it comes from.

Terry and Deborah, two girls highly skilled in basketball, are enrolled in Mrs. Rothman's seventh-grade physical education class. Mrs. Rothman has her students practice basic basketball skills for two class periods, then they spend the remaining eight class periods of the unit playing a basketball tournament. The team that wins the tournament gets an A for that sport. Even though the two girls are equally skilled, they perform very differently during the tournament games; Deborah performs well, while Terry cannot catch a ball, dribbles the ball off her feet, and never gets close to making a basket.

Why do the girls perform so differently during the tournament? One reason might be the stress they each experience. Deborah gets a little nervous before the games, but she enjoys the challenge and believes she is good enough to help her team. She also knows that her grade is not determined only by this tournament, so she does not worry about whether or not her team will win. Deborah views the stress she experiences as positive, and it actually helps her learning and performance. All day long, however, Terry worries about physical education class. "What if I make too many mistakes? Everyone on my team is depending on me to score points. They'll be mad at me if I don't. Then everyone will get a bad grade in PE because of me! I have to do well!" By the time the game starts, Terry has an upset stomach, sweaty hands, rapid heartbeat, tense muscles, and an inability to concentrate.

Professional physical education teachers would like to think that they run a stress-free class that students enjoy, but for some students, that is not the case. Unlike the organization of other subjects in school, physical education often involves the public display of students' motor performance. For example, others might see someone performing poorly on a fitness test, and that situation can be distressing. Sometimes the conditions that physical education teachers set up in class create a negatively stressful situation for students. And then there are some students, like Terry, who are more prone than others to experience stress or anxiety in evaluative situations like physical education and to view that stress as something negative.

This article explores the concept of negative stress in physical education. First, stress will be defined. Then a model describing the stress process for students in physical education will be described. Finally, strategies that physical education teachers can use to reduce negative stress for students, related to stages in the stress process, will be presented.

Defining Stress

Stress has been defined as a "substantial imbalance between demand and response capability, under conditions where failure to meet demand has important (perceived) consequences" (McGrath, 1970, p. 20). The demands may be *physical*, as when a student must perform the PACER aerobic test; *psychological*, as when a student faces ridicule from other students in the locker room; or *cognitive*, such as taking a test on



Performing in front of classmates often creates negative stress in physical education students.

soccer rules, or a team working together during sport education to come up with a practice plan and game strategies. However, simply perceiving that the demands of a situation outweigh a student's capabilities and resources does not necessarily produce stress. Stress results only if the student is worried about failing. So even though the student getting ready to perform the PACER test may not believe that she has the ability to perform well on it, she may not experience stress if she does not care how she performs.

Stages of the Stress Process

Stress occurs in a four-stage process, consisting of the situational demand, a cognitive appraisal, a stress response, and behavioral results (McGrath, 1970). Understanding these stages will enable teachers to develop means of helping students deal with negative stress in physical education.

Stage One—Situational Demand. In this stage, some kind of physical, psychological, or cognitive demand is placed on the student. Examples of such demands in physical education were described above. Some demands should simply be eliminated by the teacher, as with the case of the student being ridiculed. In most cases, however, physical education teachers need to examine the demands they place on students and make sure those demands are not excessive. For instance, the warm-up task of running four laps without stopping might be too difficult for an overweight student. The demand that Mrs. Rothman placed on her seventh-grade students—to play in a tournament after only two days of basic skill practice and no tactical practice—is likely beyond the ability of some students. The pressure of having the tournament results affect the students' grades adds considerably to the demand.

Stage Two—Cognitive Appraisal. The mere existence of a demand does not necessarily result in negative stress; it is students' perception of the demand and of their resources and capabilities to deal with the demand that are important. In addition, the personal meaning that a student places on the

consequences of the performance will influence the student's perception of threat. For Terry and Deborah, the demand was the same: play in a basketball tournament during physical education class, with the winning team getting an A. But their perception of the demand and its meaning to them was very different. Deborah thought that she had good basketball skills and was looking forward to the competition and to helping her team in the tournament. She also understood that the results of the tournament would contribute only a small part to her overall grade in physical education. On the other hand, Terry was afraid that her team was depending on her to score many points, and she did not think she was good enough to do that. She was also afraid that if her team lost the tournament, all of her teammates would blame her and she would not get an A in physical education.

A person's perception of a demand and capabilities to deal with the demand will be influenced by that person's perceptions of competence and trait anxiety (Weinberg & Gould, 2003). Students with low perceived competence related to a domain-like motor performance (i.e., in physical education) are more likely to perceive that their abilities cannot match the demand than students with high perceived competence. Terry felt threatened, in part, because of her low perceived ability in basketball, while Deborah's high perceived competence led to a much lower stress level.

Trait anxiety is a personality disposition that refers to the amount of anxiety a person typically experiences in evaluative situations. Compared to a low trait-anxious student, a high trait-anxious student is more likely to believe that demands are threatening and excessive. Differences in trait anxiety probably explain some of the differing stress levels experienced by Terry and Deborah. Terry's high trait anxiety led her to see the tournament as threatening and beyond her capabilities, while Deborah's low trait anxiety helped her view the competition as a challenge.

Stage Three—Stress Response. Students' cognitive appraisal of demands, resources, and consequences will influence their response to the demand, which has both physical and cognitive aspects. A major part of that stress response will be the students' state-anxiety level—the level of anxiety a person feels at a particular moment. Students like Terry, who perceive that the demands outweigh their resources, could experience heightened state cognitive anxiety (e.g., worry, negative thoughts, poor focus, lack of concentration) and somatic anxiety (e.g., increased muscle tension, breathing, heart rate, sweating). In addition to state anxiety, the stress response might also include other aversive emotional states, such as depression, fear, and anger (Smith, Smoll, & Passer, 2002). Conversely, students like Deborah, who perceive a match between the demands and their resources, will probably experience lower levels of state cognitive and somatic anxiety.

Stage Four—Behavioral Results. The stress response can influence a number of aspects of students' physical education experience. If the cognitive or somatic state anxiety is too high, motor performance of well-learned skills could suffer.

Terry is a good example of this phenomenon. Her lack of ability to concentrate may cause her to miss seeing open teammates or hinder her ability to make good decisions about when to shoot or dribble. Her sweaty hands and increased muscle tension may harm her ability to shoot, dribble, and pass. Besides affecting motor performance, the stress response may inhibit the learning of new motor skills. The heightened state cognitive anxiety may especially hinder the acquisition of new skills, since the early stages of motor skill learning are characterized by cognitive activities (e.g., self-talk, problem-solving; Adams, 1971; Fitts & Posner, 1967). In addition, enjoyment and even participation itself may be affected. It is hard to enjoy an activity when you are worrying and having negative thoughts related to it. If performance, learning, and enjoyment are all low, students might decide to stop participating in physical education, either by making little effort, or by choosing not to take elective physical education classes. It is likely that Terry felt threatened and was not enjoying herself much during the basketball tournament. If this happens too often during class, she may choose not to take an elective physical education class or participate in physical activities in other settings in the future.

Stress—A Cyclical Process

Stress is a cyclical process. A student's behavior or performance in the fourth stage will feed back into the first stage and influence the environmental demand. Thus Terry's poor performance as a result of her high state anxiety might increase the demand, since now she must perform even better to win the game. Maybe her poor performance actually does lead her teammates to get angry with her, which also increases the demand. Then the cycle starts all over again. If Terry eventually decides not to take any elective physical education classes in the future, she will eliminate the demand and the subsequent stages. But if the physical education teacher were to intervene at any particular stage, the outcome of the stress process could be different.

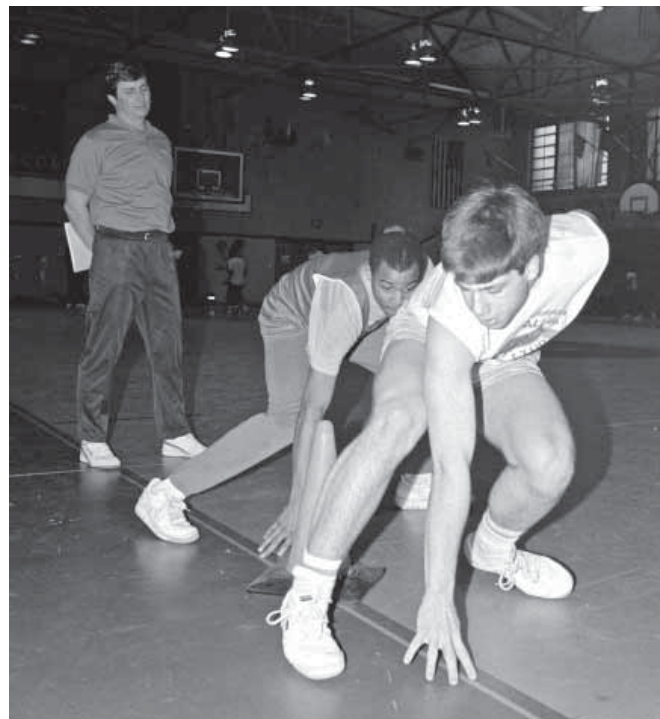
Ways to Reduce Stress

Understanding the stress process can help physical education teachers develop strategies, specific to the first three stages, to reduce students' negative stress in physical education and reduce the possibility of negative behavioral outcomes in the fourth stage. The rest of this article will discuss these strategies, which are summarized in table 1.

Stage One—Situational Demand

Create Developmentally Appropriate Tasks. The tasks that students are required to perform should match their skill and knowledge levels. Then students are less likely to find the situational demand excessive. Here are some ways to create developmentally appropriate tasks:

- *Use teaching by invitation and intratask variation.* It is unlikely that a single task that is presented to students in a physical education class will match the skill levels of all the students in that class. But teaching by invitation and intratask variation can help with that. When teaching by



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Competing in class, as in this shuttle run, can also generate considerable stress in students.

invitation (Graham, Holt/Hale, & Parker, 2004) is used, the teacher presents two or more task options to the class, and students get to choose the task that best matches their abilities: "When I say go, you may either continue striking the ball against the wall, or you may find a partner and try to keep it going between you." In intratask variation, the teacher privately changes the task for students who may be having trouble with the task: "Deanna, Patti, Madeline, and Grace, I'd like you to work on serving the ball just so it goes over the net" (while the rest of the class works on serving into targets). This task is given privately to these students, not announced in front of the class. Both teaching by invitation and intratask variation enhance the possibility that the task will match the students' abilities.

- *Teach games and sports using the games stages.* The way Mrs. Rothman conducted her basketball unit is common: one to two days of basic skill practice, then full game play. It is no wonder students experience stress in those full games; they have not practiced any combinations of skills, strategies utilizing the skills, or game-like situations. Physical education teachers should use the four games stages to develop an appropriate progression of tasks when teaching games and sports (Rink, 2005):

1. Tasks in stage one should help students gain control of individual skills. Examples: dribble a ball while moving and changing hands; serve a tennis ball to the desired place on the receiver's court; kick a rolled ball in the desired direction.

2. In stage two, students practice skills in combination with or in preparation for another skill. Examples: receive a pass in soccer, then shoot toward the goal; serve a shuttle

Table 1. Ways to Reduce Stress During the Stress Process

Stage One: Situational Demand

- Create developmentally appropriate tasks
- Arrange private practice sessions
- Use stations
- Maximize practice opportunities
- Create a task-involved motivational climate

Stage Two: Cognitive Appraisal

- Identify students with low perceived competence or high trait anxiety
- Change student perceptions of demands and abilities

Stage Three: Stress Response

- Teach students relaxation techniques
 - slow down
 - one slow breath
 - imagery
 - positive self-talk

Sources: McGrath (1970); Weinberg & Gould (2003)

in badminton, then move to home position on the court for the returned shot; bat a ball, then run to first base.

3. When students can control a skill and combine it with others, then they can practice simple offensive and defensive strategies in the third stage. Examples: in basketball, practice two-on-two, with offense working on setting a screen and rolling to the basket; in badminton, a partner tosses the shuttle over the net to a hitter and moves close to the net (right or left court) or to the backcourt (right or left) while the hitter works on hitting to the open space.

4. The fourth stage should start with small-sided, modified games before moving into the full game. Examples: play three-on-three basketball, but you can score only off of a screen; play four-on-four kickball, where you can kick only to the infield, and points are scored for each base reached.

Students should achieve a minimal level of proficiency (Graham et al., 2004) on a skill before practicing tasks at specific games stages. Children at the precontrol level of proficiency on a skill will benefit most from practicing stage-one tasks, while children at the control level are ready for stage-two tasks. Stage-three and stage-four tasks are most appropriate for students at the utilization and proficiency levels on a skill.

• *Modify the equipment.* Sometimes tasks are inappropriate and stressful for students because of the equipment being used. For instance, a first grader just learning to dribble will be much more successful with an eight-inch playground ball than a men's regulation basketball. Likewise, a seventh grader beginning to learn the forearm pass in volleyball will probably be much more successful with, and less fearful of, a trainer volleyball than a regulation volleyball. Aspects of equipment that can be modified include the height of baskets, nets, or balance beams; the size of targets, balls, and rackets;

and the material that the equipment is made of (e.g., foam paddles, trainer volleyballs, plastic bats).

Arrange Private Practice Sessions. Sometimes there just is not enough time during class to help some students improve their skills to a level at which they feel comfortable performing in front of their classmates. When possible, physical education teachers should arrange to work with students privately, outside of class, to improve their skill level. Possible times might be before school, during lunch time, or after school. The physical education teacher could be the instructor, or the teacher could supervise more-skilled students acting as tutors for less-skilled students. Such practice sessions would be especially helpful for students who have low perceptions of their competence in certain skills or for students who tend to be trait anxious.

Use Stations. Using stations for skill practice or fitness testing can help reduce the stress of performing solo in front of classmates (e.g., when students perform the pull-up test one at a time, in front of the class). For instance, stations of the various fitness tests could be set up around the gym, so that only small groups of students perform at each station at once. This would significantly decrease the number of students observing others. For instance, the following stations could be set up: curl-ups, push-ups, sit-and-reach, rope jumping, and dribbling with the hand. The first three are actual fitness tests, while the remaining two are simply fun activities. Such stations could first be used to practice the various fitness tests or even motor skill tests, perhaps just as part of a warm-up. Later, when the students are ready to be tested, the teacher could spend one day at the curl-up station, for example, testing everyone when they get to that station, then test everyone at another station on another day.

Maximize Practice Opportunities. Making sure that students get as much practice as possible reduces the situational demand in two ways: (1) it enhances students' skill levels, and (2) it prevents students from watching one another, which can be stressful for students since it is hard to watch others when you are busy practicing. Here are some strategies for maximizing student practice:

• *Use the minimum number of students necessary for a task.* Students who are learning a skill like kicking, throwing, or dribbling should first practice individually (e.g., kicking or throwing a ball to a wall, dribbling alone in general space). For more complex tasks that require working with one or more other students, the teacher should not put any more students in a group than is necessary to perform the task. For instance, if the task is to pass a basketball to a partner, no more than two students should be grouped together. The commonly seen circle-passing drill, in which one ball is passed among a group of five to six students, fails to maximize practice. If the task is to dribble against a defender and then pass to a teammate who is also being defended, groups of no more than four should be created.

• *Give every student or group a piece of equipment.* Once appropriately sized groups have been formed, each individual student or separate group should have their own

equipment. Students should not have to share equipment with other students or groups. For many teachers, this may mean that something other than the “official” equipment will have to be used. For instance, if there are not enough balls, students might use volleyballs or playground balls to practice dribbling.

- *Avoid lines.* In some situations every student has a piece of equipment, but practice is not maximized because students are waiting in line for a turn. For instance, sometimes dribbling is practiced by having students form lines and take turns dribbling up the court and back. Tasks organized like that fail to use the minimum number of students necessary for a task (as described above). Such tasks also contribute to stress because the lines allow other students to watch those who are performing. Most practice tasks can be organized in other ways, such as scattering students in general space.

- *Use modified games.* Just because official volleyball consists of six players, and official soccer consists of eleven players, does not mean games in physical education have to be played with that number on a team. Smaller-sided games, like three-on-three volleyball or four-on-four soccer, encourage less-skilled students, who might allow more aggressive players take over the game, to get involved; such practice can actually improve their skills and decrease the situational demand.

Create a Task-involved Motivational Climate. A task-involved climate is one in which the physical education teacher focuses on each student’s improvement and helps each student define success in relation to the individual’s past performances (Nicholls, 1989). For example, a teacher who is continually reminding students in a rope-jumping unit to keep trying new skills and to improve the number of jumps they get in a minute is establishing a task-involved climate. Conversely, an ego-involved motivational climate is one in which the teacher focuses the students on performing better than other students and on the outcome of performances (e.g., whether students win a game, or the place they get in a race). If the same rope-jumping unit were conducted in an ego-involved climate, the teacher would constantly compare the students to one another, both in the types of skills they could perform and number of jumps they could execute.

Competition with others is the focus of an ego-involved climate, while competition with oneself (self-improvement) is the focus of task involvement. Mrs. Rothman created an ego-involved climate in her class by giving an A only to the team members who win the tournament. A task-involved climate tends to produce a less stressful situational demand than an ego-involved climate, since in the latter, only a few students can be successful.

Stage Two—Cognitive Appraisals

Identify Students with Low Perceptions of Competence or High Trait Anxiety. Physical education teachers should identify students who might have low perceptions of competence in an activity or who are highly trait anxious. Such students are more likely to perceive situational demands as being beyond their capabilities. They are also likely to experience higher levels of cognitive and somatic anxiety, and for longer periods of time, than other students. Once such students are identified, the teacher can make a special effort to help them address their heightened stress. Perceptions of competence can be identified through a generic form, like the one in figure 1. At the start of each activity, all the students can fill out this form, rating their perception of their competence for the activity; the teacher can also name specific skills and students can rate themselves on those skills. Student trait anxiety can be assessed by having children complete either the Sport Competition Anxiety Test for Children (Martens, Vealey, & Burton, 1990) or the State-Trait Anxiety Inventory for Children (Spielberger, 1973). The children’s form of the Competitive State Anxiety Inventory (Stadulis, MacCracken, Eidson, & Severance, 2002) can assess three dimensions of a student’s anxiety: cognitive anxiety, somatic anxiety, and confidence. However, none of these instruments is specific to physical education. It may be just as helpful to look for children who regularly show signs of high anxiety when having to perform in front of others, such as consistently avoiding such situations (e.g., not dressing out or being absent on those days), a drastic decline in motor performance, worried looks, negative statements, extreme sweating, and frequent urination.

Change Student Perceptions of Demands and Abilities. Physical education teachers can help students like Terry, who may

Figure 1. Generic Form to Assess Students’ Perception of Competence

Student Name _____ Activity _____

On a scale of 1-10 (10 being the highest), how would you rate your overall skill level in this activity?
 Rating _____

On a scale of 1-10 (10 being the highest), how would you rate your ability in the following skills related to this activity?

Skill #1 _____	Rating _____
Skill #2 _____	Rating _____
Skill #3 _____	Rating _____
Skill #4 _____	Rating _____
Skill #5 _____	Rating _____

have inaccurate views of a demand or their abilities, by clearly pointing out to them how their skills are up to the challenge. For instance, Mrs. Rothman could have praised Terry for her basketball skills, describing specific past performances that show Terry was equal to the challenge. Teachers could also downplay the demand by emphasizing that the demand is not as great as students think. Students should be reminded of tasks they have practiced that lead up to and have prepared them for the current task. Mrs. Rothman could remind students like Terry that the tournament is only part of their physical education grade.

Stage Three—Stress Response

Teach Students Relaxation Techniques. Physical education teachers can help students deal with the stress response by teaching them, and giving them time to practice, some easy relaxation and stress management techniques. These techniques can be taught to the entire class during class time, or to individual students who might be particularly prone to stress. Individual lessons can occur during the lunch hour or before or after school.

- **Slow down.** One reaction to stress is to get excited and hyper-active, greatly increasing the speed with which one performs tasks. This response in turn inhibits the person's performance. Students who are stressed and who are moving too quickly should be encouraged to count to 10 (or 20, 30, etc.) and think about what they are going to do before continuing the activity. The task being performed should also be practiced more slowly until the student can move at an appropriate speed.

- **One slow breath.** Students who are experiencing high levels of state anxiety could be encouraged to take a slow, deep breath before continuing. In addition to reducing somatic anxiety, this breath will slow the student down.

- **Imagery.** Students can be encouraged to imagine one of several different scenarios to decrease their stress response (Martens, 1987). They could imagine a peaceful place or somewhere they feel relaxed, like their room, at the beach, or at their grandparents' home. They could also imagine themselves being successful at similar past tasks or even the current task. While the former type of image helps students to quiet their mind, the latter will help to build confidence.

- **Positive self-talk.** A negative stress response often includes negative self-talk. A student like Terry might say things to herself like, "This is just too hard for me. I can't do this. Everyone's going to laugh at me. I'll never be any good at this." Sometimes the self-talk takes the form of "what-ifs" ("What if I never make any baskets? What if everyone gets angry with me?"). Students need help changing that negative self-talk to positive self-talk. The physical education teacher could write three to four positive statements on an index card and give the card to a student who is suspected of high cognitive state anxiety. The student is then instructed to pocket the card, but pull it out and read the statements silently right before starting to practice each new task, repeating them periodically throughout practice, and then repeating them again after each task. It takes a long time to

change negative self-talk to positive, but this will at least get the student started on the change.

Conclusions

While the number of students who experience high stress levels in physical education is probably low, even one would be too many. A major goal of a high-quality physical education program is to "develop physically educated students who have the knowledge, skills, and confidence to enjoy a lifetime of healthful physical activity" (National Association for Sport and Physical Education, 2004, p. 11). Frequently experiencing negative stress in physical education could greatly reduce a student's enjoyment of physical activity and destroy the individual's desire to be a lifelong mover. If physical education is to be a positive, life-enhancing experience for all students, teachers should make the effort to understand the stress process in students and take some of the simple steps outlined in this article to help reduce student stress in physical education.

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