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Stress, Soldiers, and Students

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Ten years ago when my grandmother was dying, my mother's arthritis was so bad that she was unable to open a jar or shake hands. Now my mom prepares meals in the kitchen with almost the same ease that she employed while raising the nine of us. She is able to extend her hand to the person next to her at church when the priest says, "Let's offer one and other the sign of peace."

I believe that stress contributed to the severity of my mother's arthritis. Although this is just a conjecture, studies by the American Institute of Stress show that between 75 percent and 90 percent of all visits to the doctor's office stem from stress. The same statistics indicate that stress costs business at least \$200 billion a year through absenteeism, decreased productivity, compensation claims, health insurance and medical expenses. ¹

The main objective of this unit is to make students aware of how stress effects their lives. To accomplish this goal, the unit has three sections on stress: a review of the stress concept, the effects of stress on soldiers especially Post-traumatic Stress Disorder (PTSD), and the effects of stress on teenage students. These sections can either be taught or given to the student to read as background information. The students will then use their knowledge of stress to make up an administer a stress test. The unit ends with the students working with the data they have collected. My students will analyze the data with a Texas Instrument TI-82. However, the lessons do not require the use of a graphing calculator.

Many inner city students score poorly on a standardized test because they have a fear of the test itself. An understanding of stress may help students overcome their test anxiety. To further this comprehension, the first section covers the causes and effects of stress. This leads to stressors and levels of stress. The section ends with Selye's coping strategies to manage stress. It is hoped that if students acquire some knowledge about stress, that they might be able to manage it better.

The second section examines the causes and effects of Post-traumatic Stress Disorder. After the soldiers returned from Operations Desert Shield and Desert Storm in the Persian Gulf Region, some of the veterans complained of health problems. The Department of Defense (DoD) evaluated 10,020 veterans in its Comprehensive Clinical Evaluation Program. Of these soldiers, 37% were diagnosed with a psychiatric condition, most often depression or PTSD. The Institute of Medicine encouraged the DoD to emphasize in future studies that psychosocial stressors can produce physical and psychological effects that are as real as physical, chemical or biological stressors. ² Although this section concentrated on PTSD in soldiers, the intent

was to make students aware that they can suffer from PTSD. According to Ronald Kessler, a sociologist at the University of Michigan, approximately 8% of the adults in the United States have suffered from PTSD at some time in their life. ³

Teenagers don't drink to imitate adults; they drink for the same reason as adults, to relieve stress. ⁴ The third section deals with some of the stressors that teenagers encounter. Since most teenagers are in school, the unit looks at the role of the high school. The unit concludes with the hope that we as teachers can help our students deal with stress.

This unit is meant to be used in conjunction with the units developed by Antonia Coughlin and Alan Frishman. Ms. Coughlin reviews the history of the Gulf War; Mr. Frishman has his class debate the Department of Defense's handling of the existence of the Gulf War Syndrome.

Stress

The term "stress" was first used by Hans Selye, a professor at McGill University, in 1936. ⁵ He noticed that different illnesses often produced the same symptoms. This was contrary to the medical beliefs of the time which held that different diseases had distinct causes. Selye exposed laboratory animals to different agents such as infections, trauma, nervous strain, heat, and cold. The specific action of all these agents was quite different. Their only common feature was that they placed the animal under stress. Selye noticed an identical response in all the animals. With this simple experiment, Selye began the modern day study of stress. ⁶ Before he died in 1982, Selye had written almost forty books about stress.

Today, stress is one of the most well documented of all the afflictions facing humankind. Stress has been present since the beginning of time, but its impact has increased greatly in today's modern society. What started out as an instinct that helped an individual to deal better with a perceived threat has become one of the greatest problems in society. Accordingly, there is a wealth of information available on the topic.

One of the questions every article dealing with stress attempts to resolve is, "What exactly is stress?" Putting together a concrete definition for stress is quite difficult. What one person might see as stressful, such as parachuting out of an airplane, another might view as fun. For a situation to be stressful, a person must perceive the situation as being stressful. ⁷ In other words, what activities are stressful vary from person to person, making it hard to define what stress is.

Stress is more easily defined by its effects. Physiologically, stress is characterized by arousal. Stress produces changes in the central nervous system, including increased heart rate, breathing, and blood pressure. Sweating palms and a dilation of the pupils are also a result of stress. ⁸ These reactions would have given our ancestors a better chance of escaping or surviving a stressful situation. For humans today, this arousal of the central nervous system is not beneficial. Many people encounter long periods of stress from their jobs or families. In most cases these situations can neither be avoided nor escaped. This causes natural responses to stress, such as high blood pressure, to be maintained on a daily basis. Over a period of time, these responses take a toll on the body of the individual often leading to a heart attack or other stress related illness.

According to Selye, there are three different stages of response to stress. ⁹ The first stage is alarm. During this stage a person's central nervous system becomes highly aroused. People in this stage often show a marked increase in metabolism as well as possible loss of appetite, ulcers, or headaches. However, the body cannot stay highly aroused for long, so the initial alarm stage usually leads to an extended period of resistance.

During this stage, the beginning physiological and behavioral responses become more moderate and sustained. This stage can last for hours, days, or even years; but eventually resistance begins to decline. Once stress has sapped the psychological energy of a person and the resistance has been depleted, the individual enters the final stage of exhaustion. Maladjustment, withdrawal, or even suicide might result from the individual's failure to adapt to the stressful stimulus.

Psychologists have identified three broad types of events that create stress: frustration, conflict, and pressure.

¹⁰ Frustration is an emotional state or condition that results when an individual is prevented from achieving a goal he or she desires. Many times a person has no control over the reason he or she was blocked. An example would be an eighth grader who works hard to attend a particular high school and then is excluded because of a lottery system for accepting new students. The teachers who worked hard to make the school a good school feel helpless, which can lead to frustration.

Conflict is an emotional state or condition where a person has to choose between two or more behaviors. ¹¹ Neal Miller described three types of conflict: approach-approach conflict, avoidance-avoidance conflict, and approach-avoidance conflict. ¹² An approach-approach conflict occurs when a person has to choose between two equally pleasurable alternatives, for example which of two excellent restaurants to eat at. Usually this type of conflict is not too stressful because either alternative is enjoyable.

Avoidance-avoidance conflict is the type of conflict that results when neither choice is pleasurable. An example of this type of conflict could be having to choose between writing a paper or cleaning the house. This type of conflict generates the most stress as neither alternative is agreeable.

In approach-avoidance conflict, a person has to make a choice that has both positive and negative aspects. Studying for a test would be an example of an approach-avoidance conflict. The student desires to get a good grade on the test, but at the same time realizes that this will entail many hours of studying which may be difficult.

The third type of event that generates stress is pressure. Pressure is defined as an emotional state or condition which is attained trying to meet the real or imagined expectations of others. ¹³ Deadlines from work, a traffic jam, and the responsibilities of being a working parent are all examples of everyday situations that generate pressure.

The one aspect these three types of events that create stress share is that they all contain stressors. A stressor is any stimulus, real or imagined, which generates a state of arousal. ¹⁴ It is these various stimuli that create stress and consequently create its harmful side effects. How an individual copes with and manages these various stressors directly influences the magnitude of the impact stress has on the individual's mental and physical well being. ¹⁵

Research has shown that low levels of stress are actually beneficial. When people are under aroused, otherwise known as boredom, they lack the stimulation to perform optimally. Moderate levels of stress produce the best levels of performance. An individual who feels a moderate amount of stress will optimally achieve his or her goals. They will be impelled to study, will be driven to achieve athletically, or will strive towards greater heights on the corporate ladder. However, high amounts of stress have an opposite effect. People functioning under large amounts of stress tend to be ineffective. The more complex the task, the more unproductive they are. ¹⁶

One of the keys to a successful, healthy, and productive life is stress management. Selye gave three coping strategies to manage stress. First, learn how to behave to minimize stressful situations. Selye believed that it wasn't the stress that bothered a person, but rather how he or she dealt with it. Second, recognize the source of the stress. Once an individual identifies the stressor accurately, he or she may be able to bring his or her response under control. And third, a person should find the level of stress at which he or she is most comfortable. An individual who fails to manage the stress in his or her life will have several negative effects. The person's health will fail once the individual has reached the exhaustion stage. An individual who is succumbing to stress will produce less than optimal levels at work and consequently will have a harder time in the workplace. The person's social interactions will also suffer as he or she becomes more annoyed, frustrated, and hostile to other people. This eliminates one of the best coping mechanisms to deal with stress, the support of family and friends. Without such support, an individual often feels that he or she is constantly being put under more and more stress. He or she becomes less able to deal with the stress in his or her life and a vicious cycle is created, one that sometimes ends up in the individual committing suicide.

Stress and Soldiers

Sometimes, an extremely stressful event can have a lasting detrimental impact upon a person's life. A person suffering from the after effects of such an event would be diagnosed as having Post-traumatic Stress Disorder, commonly known as PTSD. According to the American Psychiatric Association, PTSD is defined as a behavioral disorder which results from a psychologically distressing event, outside the range of usual human experience.¹⁷ The key to this definition is that the stressor event is outside the realm of "ordinary" stress. How the person handles the stressor, whether they are able to successfully cope with it or not, determines whether a stress disorder will develop. A physical injury is not necessary for PTSD to develop. The event needs only to be psychologically traumatizing.¹⁸

Victims of violent crimes such as rape, assault, or torture often suffer from PTSD. Survivors of natural disasters such as earthquakes or floods may suffer from PTSD. Those who live through automobile accidents, plane crashes, or hostage situations all may develop PTSD. Any person experiencing an event outside the range of the usual human experience may develop the disorder.

People suffering from Post-traumatic Stress Disorder can usually be grouped into three categories based upon their symptoms.¹⁹ The first group is based on a tendency to relive the traumatic event through nightmares or flashbacks. Individuals belonging to this group will also display intense emotional responses when they are exposed to events which are symbolic of the traumatic event. Recollections and images of the event may be so vivid and intrusive that the person cannot lead a normal existence, constantly being haunted by ghosts from the past.²⁰

The second grouping of PTSD symptoms is characterized by a generally numbed emotional state. A generalized detachment and disinterest from life is characteristic of individuals from this group. They show an extreme avoidance of any activities, thoughts, or feelings associated with the traumatic event. These individuals go into a state of reclusion, sheltering themselves from any aspect of life which may remind them of the traumatic event.²¹

The third general group of symptoms characteristic of those suffering from Post-traumatic Stress Disorder is hyperarousal. People belonging to this category have difficulty sleeping and are often irritable. They also display a difficulty concentrating when exposed to events that symbolize their traumatic experience.²²

The symptoms of Post-traumatic Stress Disorder are, in most cases, self-perpetuating. ²³ The cycle often starts with either a physical pain, emotional discomfort, or environmental stimulus which reminds the individual of the initial traumatic experience. This reminder causes the individual to have flashbacks to the actual traumatic experience. While the mind of the individual relives the trauma, the body does also. Flashbacks are accompanied by an increase in activity in the individual's central nervous system. This increased level of activity aggravates the emotional or physical discomfort of the individual. Consequently, the victim is reminded, again, of the traumatic incident. This cycle continues, causing more and more pain and discomfort for the individual afflicted with the disorder.

Everyone suffering from PTSD has had their life negatively impacted to some degree. Those people with a mild version of the disorder are basically "normal". They are able to hold down a job, support a family, or maintain social contacts while being haunted by an occasional nightmare. Individuals with severe cases of PTSD are not so lucky, however. Their illness prevents them from functioning "normally" in society. Typically their visions of the traumatic event disrupt their lives constantly. Often, these people look to drugs or alcohol to numb their pain; a solution that only complicates their problem further. For many soldiers, the war experience is traumatic enough to produce Post-traumatic Stress Disorder. What was called, in the past, "shell shock" , "war neurosis", "battle fatigue", or "combat stress" is now known as PTSD. ²⁴ The terror of the battlefield and the horrors of war cause many soldiers to suffer from PTSD.

PTSD has, undoubtedly, afflicted soldiers since the beginning of history. In *Achilles in Vietnam* , Jonathan Shay shows that Homer was aware of PTSD when he wrote the *Iliad* . Concrete proof of PTSD exists back to the Civil War. The enormous number of desertions, over 200,000 on each side, must have contained a large number of soldiers suffering from PTSD. ²⁵ The magnitude and viciousness of modern warfare has made PTSD more and more common among soldiers. It is estimated that in 1942, fifty-eight percent of all the veterans hospital patients were "shell shock" victims of World War I. ²⁶ The war which has produced the greatest proportion of PTSD veterans was the Vietnam War. ²⁷ Soldiers in this war had to fight an unseen enemy. At no time were they safe from the threat of ambush, be it out in the combat zones or in the back areas. These soldiers put their lives at risk in an unpopular war without the support of most of their fellow citizens. In combat areas, soldiers would often be exposed to horrible atrocities. No guerrilla war is without atrocities, but the Vietnam War established a new precedent. All of these aspects combined to create a large proportion of PTSD disabled veterans.

The way in which the armed forces handled the Vietnam War also contributed to the prevalence of PTSD among the veterans. During the Vietnam War, few commanders actually put their lives at risk. Testimony in proof of this is that only seven generals and eight colonels died during the entire time span of United States involvement in Vietnam and most of these deaths came from helicopter crashes. ²⁸ Combat soldiers felt as though their individual lives were not valued by their commanders. This lack of trust in their commander destroyed one of the major bases of support for soldiers.

Another coping mechanism for soldiers is the actual unit he belongs to. In World War II, units were formed in the United States. Here they trained together, before being sent to Europe. Once in Europe, the unit stayed together. ²⁹ The long period of time the unit spent together enabled it to become a sort of extended family. The members of the unit developed a sense of camaraderie with one another. This camaraderie gave them a sense of security on the battlefield. This sense of security helped to make battle less traumatic, the soldier felt as safe as possible with his unit.

The units which fought together in Vietnam did not train together. As one individual in the unit finished his tour of duty he would be replaced by another individual. Often times a soldier would be brought to a unit in a combat zone.³⁰ He would not know anyone in the unit and his commanding officer was often noticeably absent. The soldier was forced to fend for himself and at first was almost completely on his own. All of the vital bases of security, which made warfare slightly less traumatic, were swept away.

Once the soldier had been in the unit for a while, he would develop a close circle of friends. Often, soldiers would not be friendly with everyone in their unit. Only a small group, sometimes only four or five men, would be trusted. This fact helps to explain the great number of PTSD cases among veterans of the Vietnam War.³¹

If a soldier in World War II lost one his friends in his unit, the other members of the unit were still there for him. The whole unit would feel remorse over the death of their comrade and would find strength amongst each other to overcome the traumatic event. The guidance of the commanding officer would also make their grief less, enabling them to better cope with the stress.

In Vietnam the situation was different. The commanding officer was often not trusted, seen as an individual more interested in saving his own life than those of his men. Also, the other members of the unit could not be relied upon for support. When one member of a five man circle died, there would only be four friends left. This provided too small a basis of support and strength for the soldier to overcome the traumatic loss of his friend. Unable to cope successfully with the death of his friend, such a veteran would be likely to develop a post traumatic stress disorder.

A lack of clearly defined objectives on the battlefield in Vietnam also contributed to the large percentage of PTSD disabled veterans. Combat troops are sent through various hostile regions in every war. The difference was that in Vietnam these troops constantly went over the same ground. Instead of moving forward towards the enemies capital as troops in World War II did, combat troops in Vietnam were sent to scour the countryside. When they encountered the enemy, in other words when they were attacked by the enemy, these troops were to pull back and call in an air strike. The troops were not supposed to engage the enemy, only to find him, which meant being fired upon by the enemy. The troops felt as they were decoys, pieces of meat which the army could expend in an effort to draw out a largely unseen enemy.³²

Combat troops would be sent on missions by commanding officers who rarely went along. The officers knew of the danger the troops would be exposed to and stayed behind to protect his life. Yet he had no qualm with exposing his men to this danger and consequently endangering their lives. Many of the combat troops felt this way about their officers and thought of themselves as worms on a long hook meant to catch Charlie. This sentiment only reinforced the feelings of isolation felt by most combat troops and increased the importance of their small clique of friends. When one of these men died the experience was that much more traumatic.

There were other divisions in the armed forces, which help to explain the large percentage of veterans afflicted with post traumatic stress syndrome. During the 1960's, the United States was rocked by racial tension. Especially in the south, the country was largely segregated. Blacks and whites simply did not mix. The draft was color blind however and the units in Vietnam were integrated.

This is not to say there was no segregation. The units were not segregated into white and black units. In the bush, a comrade was a comrade. It did not matter whether he was white or black. But, in the rear areas, there was obvious racism.³³ Black and white members of the same army supposedly united against a common enemy, regarded each other with almost as much suspicion as they did the Vietnamese. This racial tension

destroyed any sense of unity or cohesion a unit might have developed in the bush. Again the soldiers would withdraw into their small circle of friends, heightening their chances of developing PTSD should one of their friends be killed.

Another aspect of military service, which helps to explain the large portion of veterans suffering from PTSD, was the actual length of service. The marines committed units to combat for eighty days at a time. Many Marines served three or more tours. Serving 240 days of combat was not uncommon. A veteran of World War II who participated in D-Day probably only saw a few weeks of actual combat in the eleven months between D-Day and V-E Day. Members of the Pacific “Battle Cry” division of the Marines saw only six weeks of combat between Pearl Harbor and V-J Day. ³⁴ In short each tour of duty for a Marine in Vietnam exposed him to twice the amount of combat as a Marine saw in World War II during his entire service. A marine taking three tours could expect to see six times the amount of combat.

That prolonged exposure to combat makes men ineffective as fighters has long been known. The official World War II Army report on Combat Exhaustion concludes:

“Each moment of combat imposes a strain so great that men will break down in direct relation to the intensity and duration of their exposure . . . Most men were ineffective after 180 or even 140 days.” ³⁵

As the report says, the intensity of the combat will effect the soldier’s effectiveness. In Vietnam, where no area was secure, the threat of attack and, consequently, death was omnipresent. The intensity was high, making men more likely to become ineffective after 140 days or less. The duration of a marine’s tour, eighty days, was long enough to further subtract from the soldiers ability to cope with the trauma associated with battle. A marine serving three tours would be exposed to 240 days of combat time. This total is well above the 180 days sighted as the maximum in the army’s report on combat exhaustion. With the relatively high intensity and prolonged duration of exposure to conflict, 140 days was probably more accurate a time period before combat exhaustion, otherwise known as Post-traumatic Stress Disorder, developed. It should not be surprising then that a significant number of veterans of the Vietnam War suffer from PTSD.

The armed forces learned from the mistakes they made during the Vietnam War, as they do in every war. The importance of unit cohesion was discovered or at least given its rightful importance. The need for a bond of trust between commanding officers and their men was also realized. Soldiers were less likely to be used as bait to draw out the enemy after Vietnam. Extended periods of combat exposure were also seen to be both physically and psychologically harmful.

The armed forces learned these lessons at the expense of the Vietnam War veterans, who are afflicted with PTSD. The lessons learned however applied to the Vietnam War. Since the nature of every conflict is different, all of the lessons can not be applied. For this reason PTSD still remains a significant problem for the armed forces. Even a seemingly “simple” war such as the Persian Gulf War produced a large number of veterans suffering from post traumatic stress.

During the Persian Gulf War, military personnel and their families had to endure a great amount of stress. Due to the necessity for secrecy, troops could not be told of their expected combat duties until the moment had arrived. Thus hundreds of National Guard units and Reserve units, just recently mobilized, had to sit and wait for orders in the Persian Gulf. A projection of 50,000 casualties had been made in a full scale fifteen day war with Iraq. Members of the National Guard and the Reserves, just recently safe in their civilian lives, now found their lives suddenly threatened. For many, the actual possibility of seeing combat had seemed distant when

they had joined the armed forces. Suddenly, their lives were no longer secure. ³⁶

It was public knowledge during the Persian Gulf War that the Iraqi army had stockpiled chemical and biological weapons. Military command fully expected these weapons to be used. ³⁷ In accordance with this view, the various bases had been set up with alarm systems designed to alert the base when a biological agent was detected in the air. As Iraqi supply depots were bombed and destroyed, their biological agents were released into the atmosphere. Several of the warning systems went off on a daily basis. Whether the alarms were malfunctioning or whether biological agents were in the air in sufficient amounts is up for debate. But, the alarms going off generated a great deal of stress for the military personnel involved.

These personnel also had to endure a multitude of other stressors. These individuals had been whisked away from their civilian lives. They no longer had the support structure of families and friends, people whom they were not sure to see again. As well as the normal sense of homesickness, the culture shock of the Persian Gulf added to the stresses military personnel had to endure. Most of the personnel understood little of the culture and even less of the languages of the area. As a result they were unable to form much of a bond with the civilian population in the area, giving them less of a reason to fight for these civilians. This feeling would make the time spent in the gulf more stressful.

The vaccinations required for all of the personnel going to the Persian Gulf also generated a great deal of stress for the various personnel. They had to be inoculated against a host of strange diseases, all at the same time. As a result, the personnel were administered a large number of shots and vaccinations. The stress of simply receiving all of these shots as well as the questions in the back of every person's head as to their effectiveness generated a great deal of stress.

The environmental extremes that military personnel needed to endure in the Persian Gulf War also contributed to high levels of stress. During the war, huge amounts of petroleum were burnt due to the incineration of oil fields. Tons of chemical contaminants were released into the atmosphere. The climate itself exhibited large temperature extremes. ³⁸

All of these various elements combined to generate a great deal of stress for veterans of the Persian Gulf War.

Stress and Students

While growing up for past generations never was as idyllic as portrayed in *Leave It To Beaver*, life is more difficult for today's teenagers. They have to deal with AIDS, the increased use of guns to settle disputes, declining educational standards, and an increase in the number of families headed by a single parent. Then there is the worry, that they may not be able to find work in their field after finishing school.

As mentioned earlier, it's not the event that's stressful; it's how the person perceives it. Today, a tragedy that happens anywhere in the world is on the evening news. Even if your neighborhood is safe, the global village isn't. School has its own stresses. Ian Matthews reported that 51 percent of Canadian teenagers felt really stressed at least once a month. Sixty-five percent said their biggest stress was school. ³⁹

Many high schools today have large populations. This makes it difficult for a student to be noticed by many teachers. And yet this is what a student needs as he or she tries to develop his or her sense of self. When a student has conversations with teachers who know him or her well, the student is able to get a balanced picture of who he or she is. As the number of students increases, it is harder for the teachers to maintain social control. For example, Career High School, where I teach only has 425 students. You can visit our school

any day, any time, and you will not smell reefer in the bathrooms. I could not say that when we were a school of 1800 students in the 1970's. Over 500 parents wanted to send their children to our school last year because we are small and do put kids first.

When students aren't held accountable, they feel it is all right to do whatever they can get away with instead of doing what's right. The students know what's right; but they see that the school is more interested in promoting itself than in helping them develop their value structure. Thus, the school betrays the student, just as the leaders betrayed the soldiers. This betrayal of trust lays the groundwork for Post-traumatic Stress Disorder. Just as soldiers went berserk, students can go out of control.

Inner-city students have many stressors to contend with. Thirty-six percent of AIDS cases reported in the 13–19 age bracket are Afro-Americans, although they are only fifteen percent of this age group. Afro-American males die from homicides at a rate almost eight times more than white males. Fifty-two percent of the males under eighteen arrested for violent crimes were Afro-American. ⁴⁰ When there is a death due to a shooting, the victim's friends come to school, get a pass to leave early, and attend the funeral. Counselors are available to assist the students with their grief, but most of the time, the counselors wait alone. Again, we have the parallels to the soldiers and combat trauma.

Yet, some students are resilient and do succeed. One of our graduates just graduated from Yale. Her younger sister just had her second child. When their father died, our student received much nurture from a teacher and her husband. They provided emotional and financial support. Our student was allowed to keep growing. I don't know what kind of support the sister received.

In conclusion, we see that the relationship between a stressor and an outcome depends on many factors. We must take into account a person's past behavior, how a person perceives and deals with an event, and a person's support network. It is necessary to examine the manner in which a person's mind handles a tough situation rather than just studying the stressors. These stressors are seldom single events; many problem behaviors have multiple causes. Although there is no magic cure to overcoming stress, we, as teachers, have the opportunity to help students learn about stress.

My grandfather was gassed while fighting in the trenches of World War I. Before the war he was known as "Happy Jerry"; after the war he became "Mad Jerry." Our family always attributed grandpop's behavior to being gassed. While talking to my mother about the Post-traumatic Stress Disorder in *Courage Under Fire*, she reminded me of grandpop's story of seeing the cook's head getting blown off and landing in the pot of coffee. Working on this unit made me realize that my grandfather probably suffered from PTSD. My hope is that as my students work through this unit that they will reflect on the way they deal with stress. If they have encountered strong stresses in the past, hopefully they will seek help so that they will be able to cope with stress successfully in the future.

Lesson 1.

Objective To create a stress test.

Activity Now that students are aware of stress, it's time for them to construct their own stress tests. I am a firm believer in having the students use their own data. This causes the student to take ownership. The task then becomes real and more meaningful. You can use the following test as a model. Sample Stress Test

Read the following statements and circle the answer that best applies to you.

Attitude How
or Often
Feeling Feeling
Occurs

Almost Some- Often Almost
never times always

1. I'm unable to relax. 1 2 3 4
2. I feel I must get good grades in school. 1 2 3 4
3. I have trouble waking up. 1 2 3 4
4. I don't say what I feel. 1 2 3 4
5. I worry about my family. 1 2 3 4
6. I cannot say "no" to new demands. 1 2 3 4
7. I feel I must improve my figure. 1 2 3 4
8. I have trouble getting to sleep. 1 2 3 4
9. I feel unhappy with my relationships. 1 2 3 4
10. I forget important events. 1 2 3 4
11. I worry about college. 1 2 3 4
12. I feel I have no control over my life. 1 2 3 4
13. I avoid being alone. 1 2 3 4
14. I am unable to concentrate. 1 2 3 4
15. I fight with my mother. 1 2 3 4
16. I have headaches. 1 2 3 4
17. I feel I must be popular. 1 2 3 4
18. I grieve over the death of a loved one. 1 2 3 4
19. I feel increasingly cynical. 1 2 3 4
20. Events must be perfect. 1 2 3 4

An alternate test could be made based on Thomas Holmes' scale of life changes. Holmes studied the effects stresses had on individuals for over twenty years. He then rated the stresses. He believed that too high a score, over 200 in a single year, was too much stress for a person to handle without getting sick. A portion of the items from his scale are:

The Holmes Scale of Life Change Units

Events	Scale of Impact
Death of spouse	100
Divorce	73
Jail term	63
Death of close family member	63
Personal injury or illness	53
Marriage	50
Fired at work	47
Pregnancy	40

Gain of new family member	39
Death of close friend	37
Outstanding personal achievement	28
Begin or end school	26
Change in residence	20
Change in schools	20
Christmas	12
Minor violations of the law	11

Critics of the scale point out that there is no correlation between a high score and illness. Also, the scale doesn't take into account human differences. Remember, a person must appraise a situation as stressful for it to be stressful. And finally, the scale only includes major life events. The stressors most people face are seldom crises; they are the everyday events listed in the first chart. However, I feel the Holmes scale would still make a good lesson. Have each student list five events that would be appropriate for the student's age group. Compile a list with the rest of the class. Break the class into groups and have each group rate the stress level of each event. Also, have the class come up with the score where the level of stress will be unhealthy.

Lesson 2.

Objectives

1. To create a box plot.
2. To identify and use vocabulary related to data values in a box plot.

Activity A box plot allows a person to visualize how a set of data is distributed.

(figure available in print form)

Five summary values are needed to construct a box plot: the smallest value, the first quartile, the median, the third quartile, and the highest value.

To make a box plot, arrange the data in ascending order. The median is the middle value. If there is an even number of data items, the median is the mean of the two middle values. To obtain the first quartile, find the median of set of numbers that are in front of the median. Similarly, the third quartile is the median of the set of numbers that lie after the median.

The difference between the first quartile and the third quartile is called the interquartile range. It is the length of the box and represents the middle 50% of the data.

(Many colleges now list the first quartile and third quartile SAT scores of their freshman class.)

1. Make a box plot of the stress test scores.
2. Write a paragraph describing the information pictured in the box plot.

Lesson 3.

Objectives

1. To organize data in a histogram.
2. To understand the percentile rank of a data value.

Activity Histograms are used to display large amounts of data. A histogram is a picture that shows how a set of data is spread out and how it is bunched together. There should be no fewer than 10 intervals and no more than 25 intervals. The individual bar width is arbitrary. However, each bar should have the same width.

In a large distribution, the percentile rank is the percent of scores that are below the given value. A percentile rank gives a good indication of how a score compares to the others.

1. Graph a histogram of the stress test scores.
2. What score is at the 70th percentile?
3. Does a histogram or a box plot describe the stress test scores better?

Lesson 4.

Objectives

1. To learn the median-median best fit procedure.
2. To calculate the median-median line for the stress test data vs. days absent.

Activity Many times you want to use an equation to model a data set. In our case, we want to see if there is a straight line that can describe the relationship between the level of stress and the number of days absent. A median-median line is one method to find a best-fit line. In a median-median line three points are used to represent the entire data set. The equation that best fits these three points is then used as the model for the data.

We will list the scores for the level of stress along the horizontal axis and the days absent on the vertical axis. To find the points, first arrange the data values in ascending order by levels of stress. Next divide the data into three equal groups. If there is one extra value, place it in the middle group; if there are two extra values, place them in the first and last group. Now find the median of each group. These will be the x-values of the three points. To find the y-values, arrange the days absent in ascending order. Break the data into three groups and find the medians of each of these groups just like you did for the level of stress. Note that these median points do not have to be points in our data set.

Now that we have the three points, find the slope-intercept equation of the straight line that passes through the first and third point. Next find the slope-intercept equation of the straight line that passes through the second point and is parallel to the line we just found. The slope of the median-median line will be parallel to these lines. To find the y-intercept for the median-median line, we need to find the average of the two y-intercepts. However, we count the first y-intercept twice. So, take the first y-intercept, double it, and add this product to the second y-intercept. Take this sum and divide it by three; this is the y-intercept for the median-

median line.

If the median-median line is a good fit, it should show the direction of the points. The line should divide the points equally. The points above or below the line should not be concentrated at one end. If these conditions are met, we may have a best-fit line. Otherwise, we will have to use another kind of line to describe the data.

1. Calculate the median-median line for the stress test data vs. days absent.
2. Analyze the line against the data to see if it is a best-fit line.

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