

# Discussing the Stress Epidemic in Corporate America

By Bill Howatt Ph.D.

© 2002

## ABSTRACT

This paper examines the linkage of how chronic and prolonged stress can lead to illness and/or disease. This paper provides an introduction from the literature on the scope and cost of stress on society and corporations and how stress directly impacts the mind and body; introduces several independent variables that influence how a person is influenced by stress; and explores the connection between stress and frustration and burnout. Chronic and prolonged stress costs individuals their health. In addition, it costs society and corporations trillions of dollars each year. This could be reduced with a proactive approach to mitigating the stress epidemic in corporate America.

## Chapter 1 – Defining Stress and its connection to illness and disease

*Three-fourths of employees believe the worker has more on-the-job stress than a generation ago.*  
– Princeton Survey Research Associates (1997)

Is stress an epidemic in corporate America? It is common knowledge that the word stress is well ingrained into the zeitgeist of North American culture, but does the average person really understand how stress can be linked to illness and disease? Do corporations really appreciate the cost of stress? More importantly, are companies aware that reducing stress in the workplace is a sound business decision? The outcome of this paper is to educate the reader to better answer these kinds of questions.

This paper will: a) discuss the scope of the epidemic of stress in society and corporate America; b) introduce stress theories and *fight or flight*; c) introduce some reasons why some people are more impacted by stress than others; d) discuss the relationship between stress and conflict; e) discuss burnout.

## Defining Stress

Oxford Dictionary (2002) defines stress as “a state of affairs involving demand on physical or mental energy.” Lazarus (1999) describes stress as a feeling that comes from a perceived threat that is at risk of being outside the person’s psychological resources.

What causes stress? Perhaps what does not cause stress is a better question. The list of causes of stress is exhausting. Stress can be caused by environmental stressors (e.g., noise and air pollution), social stressors (peer pressure and negative workplace), psychological stress (e.g.,

anxiety disorder), emotional stressors (e.g., anger management), and financial stressors (e.g., debt).

The behaviors people use in an attempt to compensate for stress and that can put them at risk are numerous, such as: drugs, anger, isolation, and food. The point is that each and every person will compensate for stress differently. When a person chooses at-risk behaviors they increase the likelihood of developing major life obstacles.

There are two kinds of stress: 1) good stress (Eustress) and, 2) stress (Distress). Obviously, when talking about the negative impact of stress, research is referring to distress. From this point on when using the word stress it is referring to distress.

For some, it may not make sense, but it is important to note that humans need stress. The challenge is to achieve the benefits that are gained from good stress and not to become overwhelmed by stress. Selye (1976) explains that stress keeps people alive, as it helps prepare a person to be in their peak state of motivation that opens the door to positive achievement. Selye (1980) further suggests that good stress can assist a person to be more in tune with their environment that supports them to make better decisions and to be more productive.

In addition to defining stress as eustress or distress, stress can be observed in three different categories. The levels move from mild to severe. The three levels of stress are: 1) Acute stress – stress that arises from day-to-day interaction in the world that is due to some kind of conflict that is often temporary (Bryant & Harvey, 2000); 2) Chronic stress (subordinate stress) – the result of an acute stressor such as a work related issue that goes on day in and day out (e.g., conflict with boss) that wears at the person daily and puts them at risk for suffering the negative impacts of stress, such as stress related illness (Gottlieb, 1997); 3) Traumatic stress – a stressor that is outside the person’s normal coping skills, such as an accident or disaster (Schiraldi, 2000). Mitchell & Everly (1995) developed the term critical incident stress, as well an intervention process called critical incident stress debriefing as a strategy to prevent the potential development of post traumatic stress disorders associated with traumatic stress when a person does not receive appropriate intervention. Chapter 3 will discuss stress theories, which indicate how the body’s stress response system works – which makes the point that an over-active stress response is dangerous to one’s health

## **Connection of Stress to Illness and Disease**

How does stress cause disease? This occurs through a combination of psychological and biological factors. When psychological stress, such as change, loss of job or drop in stock price occurs in the workplace, it can have a negative impact on the body. When a person is stressed, the body activates a response that increases the production of norepinephrine, glucocorticoids, and epinephrine, which have been linked to the development of illness and disease (Cohen, Kessler, & Underwood, 1995). Selye (1980) explains that stress that is chronic can change the body’s normal functioning in areas such as the sympathetic adrenal medulla system and anterior

pituitary adrenal-cortex system. In fact, scientists suggest that the levels of glucocorticoids in the blood system can be correlated to the amount of stress. The greater the levels of glucocorticoids, the greater the stress level (Welberg, Seckl & Holmes, 2001), and the greater the person's chances of developing a stress related illness.

**The following sections will provide an introduction to how stress can influence psychological factors and can negatively influence the body. The combination of these two factors is where the connection to stress and illness/disease can be observed.**

It is important to have a clear definition for illness and disease to better understand their connection to stress. Illness is defined by the Oxford (2002) dictionary as poor health resulting from disease of body or mind; sickness. Disease is defined by the Oxford (2002) dictionary as a “pathological condition of a part, organ, or system of an organism resulting from various causes, such as infection, genetic defect, or environmental stress, and characterized by an identifiable group of signs or symptoms.” In addition, the statistical data that will be shared in this text will show the extensive cost of stress to the individual, society, and corporations.

Science tells us that regardless of the origin of stress, chronic and prolonged stress can lead to the same consequences of illness and/or disease (Psychosomatic Medicine 2002; 64:714-26). Stress can result in emotional and cognitive issues such as depression (Beck, 1997), upper respiratory illness (Cohen et al, 2002), and a negatively impacted immune system (Cohen, Miller & Rabin, 2001; Cohen et al, 2003). Talbott & Kraemer (2000) explain that chronic and prolonged stress releases chemicals such as cortisol (stress hormone) that in excessive amounts directs the endocrine system and other hormones to attack the body. This constant attack over time can break down the body's immune system and organs system (e.g., heart) – a precursor for disease. In addition, stress can have a major impact on the brain, negatively impacting behavior. Specifically, an intense stress, which lasts only for several hours, can lead to structural change in the hippocampal region of the brain (McEwen, 2000), resulting in an immediate negative impact on a person's quality of life.

Cooper & Watson (1991) provide important insight that dealing with stress in a proactive way can reduce the person's susceptibility to diseases such as cancer.

As much as stress is talked about in the workplace, what percentage of professionals is aware of the relationship between stress and illness/disease? What percentage of professionals dismisses the real danger of prolonged stress with comments such as, “it is all in their head”? Both are interesting questions. There is no research that can clearly state that all illness or diseases are caused by stress. On the other hand, there is empirical evidence that points out that stress can cause or worsen illness (Ali, 1999).

Graham Clarke, the National Health, Safety & Environmental Manager (n.d.) states, “80% of all modern diseases have their origins in stress.” If this is true, corporations after reviewing the below statistics would be well advised to be active in addressing stress in corporate America.

Wimbush and Nelson (2000) predict that 50%-80% of all doctor visits are due to stress-related concerns. This provides compelling evidence that stress is a real epidemic in America.

Cohen and Williamson (1991) report that advancements in science are making it clearer to interested parties that the connection between stress and illness/disease cannot be ignored because the stakes are too high. Miller (1998) points out that stress can negatively impact a person's immune system and put them at greater risk for suffering the effects of stress, such as illness and disease. Coon (2002) adds that psychological factors such as stress are scientifically linked through research to negatively impacting a person's immune system. **Miller et al (2004) report prolonged and intense stress can weaken the immune system, which can impact the body's resiliency. For example, the authors report a person who is chronically stressed and has a weakened immune system will not gain the potential benefits from an influenza vaccination. Logan et al (2000) report that a person who is stressed and goes for dental work is much more likely to develop an infection than a person who is not stressed. The point that is being made is that stress can be associated with many of the health issues and concerns of the day.** Wimbush & Nelson (2000) suggest a chronically overactive stress response system can lead to the development of psychosomatic symptoms. All of these researchers have provided more evidence that stress can break down both the mind and body.

With this linkage, medical researchers are expanding their interests into a science called psychoneuroimmunology. The goal of this science is to better understand the connection between stress and illness/disease. Plotnik (2002) states, "Psychoneuroimmunology is the study of the relationship among three factors: the central nervous system (brain and spinal cord), the endocrine system (network of glands that secrete hormones), and psychosocial factors (stressful thoughts, personality traits and social influences" (p.488). **Kiecolt-Glaser et al (2002) promote the idea that this field of study will have a major impact on the future of medicine in a positive and proactive manner. The authors go on to suggest that for long-term health a critical element is healthy living. Healthy living involves engaging in a healthy nutritional plan, active lifestyle, regular exercise, sufficient rest and sleep, and finally, proactive strategies to reduce the impact of acute stress (Travis & Ryan, 2001).**

Chapter 5 will point out some independent variables that will influence a person's perception, which will impact their emotional and cognitive state. This chapter supports the case that professionals will benefit from learning more about these kinds of connections so to better arm themselves to make more proactive choices to prevent stress. In addition, this information will assist a person who is suffering from an illness to learn to take control of their stress and increase their chances of recovery (Talbot & Kraemer, 2000).

The above literature shows the connection of stress to illness and disease. One critical point to keep in mind is that stress does not have to morph into an illness or disease to be dangerous; stress alone can kill (Selye, 1976). Taking the example of the person with high blood pressure under stress, they may be at risk of a heart attack.

Chapter 1 introduced the relationship between stress and illness; Chapter 2 will introduce empirical evidence of the scope of the stress epidemic and the cost of stress.

## **Chapter 2 – Scope of the Stress Epidemic**

This chapter will provide statistical evidence of the cost of illness and disease. On March 14, 2004, the U.S. Census Bureau, Population Division, reported the population of the United States as being 292,766,248. For future reference, it would be helpful to make a mental note of this point.

How many people in the United States are directly impacted by stress? The below data will assist the reader to make some educated assumptions as to the magnitude of the stress epidemic.

1. **Obesity** – The Centers for Disease Control and Prevention (2004) reports that 60 percent of Americans are overweight or obese. Approximately 300,000 U.S. deaths a year currently are associated with being obese or overweight, and total direct and indirect costs attributable to these conditions amounted to \$117 billion in 2000.
2. **Diabetes** – It has been reported that close to 15 million Americans over the age of 18 were diagnosed with diabetes in 2000, and 800,000 new cases are diagnosed every year (American Diabetes Society, 2004).
3. **Asthma** – Asthma-related medical expenditures were \$11.3 billion in the United States in 1998; direct costs accounted for \$7.5 billion; and indirect costs were \$3.8 billion (American Lung Society, 2004).
4. **Immune system disease** – 20% of the entire population suffers from an immune disease (Business Communications Company, 2003).
5. **Cardiovascular disease** – Coronary heart disease is the leading cause of death in the United States, with over 700,000 deaths annually. Approximately 60% of all Americans age 18 and older report that they are physically inactive (New York State Department of Health, 1999).
6. **Digestive disorders** – 60 million to 70 million people have some form of digestive diseases impacting their quality of life (Everhart, 1994).
7. **Addictions disorders** (e.g., food, drug, gambling, sex, work, Internet) and mental health issues are reported to cost the United States approximately \$99 billion annually, providing evidence of the staggering cost associated with conditions that can be linked to stress (Surgeon General, n.d.).
8. **Migraine headaches** – “Migraine is a significant public health problem, with more than 28 million sufferers in the United States. More women than men have migraines, as 18 percent of women and 6 percent of men report migraine at some

point. The cost to the U.S. economy is approximately \$17 billion annually in health care and lost labor costs” (Aldinger, 2003, ¶ 2).

9. **Irritable Bowel Syndrome** has been determined to impact about 15% of the American population (approximately 40 million people) (McQuillan, 1995).
10. **Rheumatoid arthritis** – An estimated 40 million Americans have some form of arthritis or other rheumatic condition. That number is expected to climb to 59.4 million, or 18.2 percent of the population, by the year 2020, according to a new report published as a collaborative effort between the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), the Arthritis Foundation, and the American College of Rheumatology.
11. **Cancer** – It is estimated that in 2004, 573,700 men and women will die in the U.S. of cancer (American Cancer Society, 2004).

At best, the above data can provide corporations with compelling evidence that reducing stress has the potential to reduce the negative impact of illness and disease on productivity, morale, insurance costs, and so forth. The research is becoming clearer in defining the magnitude of stress. When one considers the U.S. population and then totals the approximate number of people with just the above eleven illnesses, the number adds up to in excess of 300 million. Without question, this number has to be wrong, since there are not 300 million people in the U.S. Whatever the real number, these data do suggest that the total costs of treating illness and disease in the U.S. is in the trillions of dollars per year. Without debating the exact percentage of the above conditions and the relationship to stress, it is safe to make an educated assumption that stress is dangerous, expensive, and deserves great attention for the long-term health of the population in the United States.

The above is a global snapshot of the impact of illness on the U.S. general population. In the corporate world, there is also specific research that connects the relationship of stress and illness/disease in the workplace to the potential cost and loss. Sauter et al (1997) provide the following information that reports the impact of stress on the employee’s long-term health. [The below five points have been adapted from Sauter et al, 1997.]

1. **Cardiovascular Disease** – It has been found that psychologically demanding jobs can put employees in a mind frame of feeling out of control, which increases stress and risk for developing cardiovascular disease;
2. **Musculoskeletal Disorders** – These can be found in professionals who are chronically stressed, as they can be at risk for developing back and upper-extremity musculoskeletal disorders;
3. **Psychological Disorders** – These can be found in professionals who are chronically stressed in their roles, as they can be at risk for developing mental health problems, such as depression;

4. **Workplace Injuries** – These can be found more in working conditions that are reported as being stressful and can interfere with safe work practices and increase the risk for workplace injuries;
5. **Suicide, Cancer, Ulcers, and Impaired Immune Function** – There is a growing body of research that suggests stress can be connected to these concerns.

It is estimated that businesses spend \$150 billion annually on stress-related problems and mental illness by bearing such costs as lost productivity, health insurance, and disability claims” (Vecchio, 1991, p. 435). Reynolds (2004) purports that stress on average cost companies \$645 per employee last year, according to a survey by CCH Inc., providing more evidence that stress is an expensive problem for both society and corporations.

Regardless of the exact dollar cost of stress or exact percentage of illness and disease caused by stress, the above data provide evidence to make the assumption that one proactive solution for companies to mitigate the stress epidemic in corporate America is to first accept that there is one.

Another important motivator for companies to consider when looking at the stress epidemic is that governments are starting to increase their expectation on employers to start to take action to address the stress epidemic proactively. For example, the U.S. Department of Labor, Occupational Safety <http://www.osha.gov/> promotes the following: “The agency's vision is that every employer and employee in the nation recognizes that safety and health adds value to the American businesses, workplaces, and workers’ lives.”

Chapter 2 explored the potential cost of stress. Chapter 3 will provide an overview of stress theory to show how stress impacts and breaks down the body, from a biopsychology perspective, to assist the reader to understand how illness and disease occur.

### **Chapter 3 – Stress Theories and Fight or Flight**

This chapter will provide an introduction to two popular stress theories and an overview of the *fight or flight* system (stress response).

#### **Cognitive Theory of Stress**

Lazarus & Folkman (1984) point out that it is not the amount of stress that determines a person’s stress level, it is how they are able to process and cope with stress cognitively. The authors go on to suggest external evidence alone does not cause stress. Cognitive theory promotes the concept that the amount of stress a person experiences from an external event is associated with their perception filters. Chen et al (2003) report that psychological factors play a role in predicting who will be impacted by stress. They provide evidence of the relationship between stress and clinical asthma, as well as the relationship between psychological beliefs and wellness. The better a person can manage their psychology state, the less negative impact stress will have on their immune system, which protects the body from illness and disease.

Cohen et al (1999) explain that psychological stress will lead to more health issues. The authors go on to report that in persons with chronic and prolonged stress, levels of interleukin (IL) (chemical active in keeping the stress response turned on) will increase, putting them more at risk of developing illness and diseases.

Sheldon Cohen is also the author of the Perceived Stress Scale, which is becoming one of the most popular tools for measuring the perception of stress by asking the client questions that assess the situation in their life to obtain an appraisal of the levels of stress the person is experiencing (Cohen, Kamarck, & Mermelstein, 1983; Cohen, Kessler, & Underwood 1995). [Sheldon Cohen is a prolific writer and researcher on the impact of stress and the body. For a complete list of his work, go to his website at [http://www.psy.cmu.edu/~scohen/.](http://www.psy.cmu.edu/~scohen/)]

This model differs from Selye's (below), which focuses on the physiological impact of stress. Lazarus' (1993) research led him to wanting to understand the impact of stress from a psychological point of view. Lazarus' (1966) thesis is that no two people will filter an external stressor in the same manner, and what is stressful to one person may not be to another.

This model has two clear components, the primary appraisal (what is the stressor and its potential threat?) and secondary appraisal (once the individual knows what the stress is, they must determine what they can do to cope) (Lazarus, 1993).

Plotnik (2002) states, "Primary appraisal refers to our initial, subjective evaluation of a situation, in which we balance the demands of a potentially stressful situation against our ability to meet these demands" (p.482). There are three categories of primary appraisals. It is important to note that all situations will not always fall within one area, and a stressful situation can include any combination of the three. Lazarus (1966) explains the three as: 1) Harm/Loss – Impact of damage has occurred to a person (e.g., fired from job); 2) Threat – There is a potential for a particular harm or loss (e.g., potential cutbacks); 3) Challenge – There is an opportunity for personal and emotional gain, but the person must focus and muster all their present physical and psychological energy to succeed in this challenge.

Lazarus (2000) warns that in any stressful situation (e.g., conflict with senior manager) it may be difficult for a person to clearly determine which of the above three appraisals is impacting them psychologically. He goes on to infer that when a person is overwhelmed and cannot get a psychological bearing as to what to do and the degree of threat, it is normal for the body to be driving physiological change, with the goal of protecting itself. This process is referred to as *fight or flight*, which is explained in more detail below.

After a person has determined and assessed the stressful event, Lazarus (1966) explains that they move automatically to what he calls the secondary appraisal. In the secondary appraisal, the person starts to pool internally what resources they have at their disposal to cope with the situation, such as: psychological, social, time, and physical (Lazarus, 2000). Once this appraisal

inventory is completed, the person must determine what action they will need to take or not take to address the presenting external stressor (Coon, 2002).

How effective a person is able to cope with the stressor depends solely on their resources and their ability to align their resources in a proactive strategy (Covey, 1992). When the stress is greater than the person's resources, it will start to impact not only their cognitive abilities but also their physiology (Selye, 1976).

Lazarus (1993) purports that stress is dealt with via two kinds of actions: 1) problem-focused coping – controls the stressful situation directly; 2) emotion-focused coping – control of one's emotion in the stressful situation. The author goes on to say that a person can attempt to do both, but normally will put their resources into one of the two possibilities. Lazarus (1993) suggests that when a person can deal with the situation they will, for the most part, attempt to deal with the concern. He explains that when it is overwhelming and out of the person's direct control they will focus on controlling emotions.

### **General Adaptation Syndrome**

Hans Selye (1976) promoted the concept that a healthy and happy life is the result of doing things that are enjoyable and of value to one's quality of life. His text *Stress and Life* (1976) provides an overview of his theory on stress, called General Adaptation Syndrome (GAS), which is a model that explains how stress impacts the body. The GAS theory has three phases: *Stage I: Alarm Phase* – The body starts out in a neutral state of being unstressed. But once stress starts to intrude the person, such as someone taking a person's parking spot, this is known as the stressor. Each stress impacts the body as an alarm. The purpose of the alarm stage is to prepare to protect and defend the body. The body starts to become aroused and activates the sympathetic nervous system, releasing hormones to prepare to activate the *fight or flight* response (see below). Throughout the day, each person in their work environment is exposed to a variety of perceived stressors that can increase their level of stress (e.g., conflicts with peer, a particular client, a conflict with a manager). In this phase, Selye (1976) explains that the following occur: 1) temperature and blood pressure drop; 2) heart rate quickens; 3) muscles become weakened with excessive hormones. He goes on to explain that the body cannot maintain such a heightened degree of arousal for long.

*Stage II Resistance Phase* – Most stressful situations are not severe enough to cause death, which allows the person to enter phase 2, called resistance, which is the body's attempt to survive in an aroused state, and adjust to the stressor of the environment. In this phase, the body is trying to compensate and adapt to the present stressors. The body's physiology has been elevated to the maximum level of stress where the individual is still organically alive and functioning. Though the person is still functioning, it is important to note that their cognitive abilities in this phase are decreased, which can impact decision-making abilities.

The body makes the following kinds of compensations. The pituitary gland releases Adrenocorticotrophic Hormones (ACTH) and stimulates the adrenal cortex to continue releasing corticosteroids. This hormone works to increase the body's resistance to stress. As resistance to specific stressors increases, most of the physiological processes return to normal. Although things appear normal, they are not. To survive in this phase, the body is forced to use a large amount of its energy stores (mineral, sugar, and hormones). The body reacts as if it is in a low grade chronic level of *fight or flight*, and will, over time, expose the person to the potential of stress illness (psychosomatic) taking hold (Selye, 1976).

*Stage III Exhaustion Phase* – With continued exposure to chronic stress that is perceived as bad by the person, over a period of time, the body's ability to resist stress weakens, until there is a physiological collapse. This is the beginning of the exhaustion phase. The pituitary gland and adrenal cortex are unable to continue secreting their hormones, and the person is unable to keep their energy levels up to fight stress. The body is no longer able to produce adrenaline, because blood sugar levels have declined. The person has little ability to tolerate stress, and will report being mentally and physically tired. When the body is at a chronic level of stress, it is similar to the gas pedal on a car being stuck. The body keeps producing gas (chemicals) even after the threat or stressor is gone. This is where the hypothalamus-pituitary-adrenal (HPA) axis (critical component of the human endocrine system) is locked on, like a stuck gas pedal. This overactive HPA produces more chemical than the body needs, and if not turned off will eventually lead to a decrease in production of interleukin-6, an immune-system messenger.

In this phase, a person has a compromised immune system and is at greater risk of stress illness (psychosomatic), such as flu and colds. That is the beginning. As mentioned earlier, if stress continues, stress illness can lead to disease.

With the advancements in science, the field of health psychology has advanced Selye's model and expanded it to also include the psychological makeup of the person, as well as their core coping skills (Taylor, 1997). This updated model also takes into consideration how an individual's state (psychological) is active in evaluating the external stressors (Basic Behavioral Task Force, 1996). Taylor (1995) promotes the need to look at the following three components to assess the full impact of stress on the body: physiology, emotions, and thinking.

### ***Fight or Flight Response***

When a person is exposed to a perceived threat, it can trigger the *fight or flight* response. Harvard physiologist Walter Cannon discovered this response, and taught the world how it is hard-wired into the human brain and how its sole function is to protect the body (Wolfe, Barger, Benison, 2000). White & Porth (2000) explain that the *fight or flight* can be observed and monitored by observing how external stressors can trigger and stimulate a person's physiological state. The challenge for individuals is to learn how to control their *fight or flight* response. To do so, one logical step is to be aware of the impact of perception, GAS, and *fight or flight* response.

The *fight or flight* response evolved to assist human beings to move from the hunted to the hunter and eventually become the king of the food tree. The ability to process fear and respond was critical for human survival. Today, the *fight or flight* in some cases may be overkill. For example, science teaches us that the *fight or flight* is either all on or all off; it cannot be turned half on or half off. The *fight or flight* is not designed to tell the difference or process the discrepancy between a bear and a baby! The response is designed to protect humans from danger.

Threats that occur in corporate America for the most part are not physical as much as they are mental. As mentioned previously, stress occurs once there is a perceived threat and the brain initiates the *fight or flight* defense system. This occurs through a chain reaction that triggers a series of chemical reactions whose purpose is to prepare the body to fight (make a stand) or flee (get to safety).

The *fight or flight* response can lead a person to act out aggressiveness, and that can be counter-productive. For example, an act of aggression can hurt other people emotionally or physically. In addition, releasing these kinds of hormones on a constant basis when the body is not in real physical danger contributes to breaking down the body, as mentioned in the exhaustion phase of GAS.

## How Fight or Flight Works

Once the body perceives a threat through one of its five senses, it activates the *fight or flight* response, and continues until the brain stops sending a danger signal (again, the danger is a threat that may be real or perceived). As soon as the brain detects that there is a threat, a number of its parts, such as the hypothalamus, amygdala, and pituitary gland, become activated and start communicating to each other that a threat is evident. Together, these structures start to inform the entire body through hormones and nerve impulses. For example, the pituitary gland releases the chemical called adrenocorticotrophic (ACTH), which stimulates the adrenal cortex (monitors levels of minerals and glucose) and sympathetic nervous system.

With the perception of an immediate threat, ACTH starts the chain reaction that upsets the balance between two branches of the autonomic nervous system:

1. Sympathetic nervous system – Supports the *fight or flight* response system and becomes the dominant force in initiating the response system. It increases heart rate and several other responses listed below.
2. Parasympathetic nervous system – The non-emergency system takes a passive role and waits for its opportunity to start to return the body to homeostatic balance. It is most active and does most of its work in the REM stage of sleep.

A point of reference to keep in mind is that for this nervous system to provide maximum benefits, the person needs to get a good night's sleep. **Savard et al (2003) provide evidence that**

**suggests there may be a connection between stress weakening the immune system and insomnia.**

When the sympathetic nervous system alerts the adrenal glands, its first reaction is to send epinephrine (adrenaline) into the bloodstream, which directly impacts the body (e.g., speeds up heart rate). In addition, the adrenal gland puts out more cortisol and other kinds of glucocorticoids that turn sugar in the body into energy. Another important hormone that assists the body to have energy is norepinephrine. Epinephrine and norepinephrine assist the body to have more energy by increasing heart rate, blood pressure, and sugar.

Following is an overview of some key functions stimulated by the sympathetic division during the *fight or flight* response (adapted from Nova Scotia Department of Justice class notes, 1998):

1. Stored sugars and fats are released into the bloodstream to provide quick energy;
2. Breathing quickens to provide more oxygen to the blood;
3. Hair stands up (piloerection) in preparation to regulate skin temperature;
4. Muscles tense in preparation for action;
5. Digestion ceases so that more blood is available to the brain and muscles;
6. Blood-clotting mechanisms are activated to protect against possible injury;
7. Perspiration increases to help reduce body temperature;
8. The pupils dilate and the sense of smell and hearing become more acute;
9. Increased heart rate, blood pressure, and respiration, pumping more blood to the muscles, supplying more oxygen to the muscles and heart-lung system;
10. Thickening of the blood – to increase oxygen supply (red cells), enabling better defense from infections (white cells) and to stop bleeding quickly (platelets);
11. Prioritizing – increased blood supply to peripheral muscles and heart, to motor- and basic-functions regions in the brain; decreased blood supply to digestive system and irrelevant brain regions (such as speech areas). This also causes secretion of body wastes, leaving the body lighter;
12. Secretion of adrenaline and other stress hormones, to further increase the response, and to strengthen relevant systems;
13. Secretion of endorphins – natural painkillers, providing an instant defense against pain;
14. The stress response hormones cause a number of biochemical and physiological changes.

An overactive *fight or flight* response that is turned on for a prolonged period of time (weeks to months) can put a person in grave danger of developing a stress related illness, because the body

is constantly dumping cortisol. Coon (2002) reports, “Because cortisol can suppress the inflammation immune response, the release of more cortisol under stress could be associated with greater susceptibility to infectious agents (p. 302). Goebel et al (2000) purport that exercise is critical in assisting the body to recover faster from active stress response because exercise produces cytokines, which are thought to help to get the body back on a healthier track faster by controlling the active stress response system. A not-so-obvious problem of stress is that when the body’s *fight or flight* response is active and the body gets sick due to a weakened immune system, there is some evidence by Cohen et al (2003) that antibiotics may not be as effective. This suggests that traditional medicine may not be as effective in treating a person who is stressed as a person who is managing their daily stress.

Chapter 3 provided an overview of two key stress theories and the *fight or flight* response. Chapter 4 will introduce the concept of why stress impacts each person differently.

## **Chapter 4 – Why Some People are Impacted by Stress More Than Others**

Why do some people become more stressed than others? As mentioned previously, no two persons are the same, thus no two people will process external stressors the same way. This section will introduce eight independent variables that point out some examples of how people process and react differently to stress. Every normally developed human being has the same anatomic blueprint that includes the physiological *fight or flight* response. To help answer the above question, the following will introduce several concepts. Each topic of the seven independent variables could be an entire paper on its own. The goal of this section is to provide a brief introduction.

### **Internal Locus of Control (ILOC) vs. External Locus of Control (ELOC)**

Rotter (1954) defined external locus of control as a person believing that external world influences determine their circumstances. For example, a boss yelling would, for an externally motivated person, be a reason for stress. Rotter goes on to define internal locus of control as a person believing that they are in charge of their action, and the external world only provides information. Thus, the boss yelling may not be a great experience, but from an ILOC perspective the employee still has choice as to how they will respond. The ILOC position is one that is clearly more advantageous and less influenced by external stressors, though this does not mean an ILOC person does not get stressed.

### **Personality Traits**

Personality can be an important variable in predicting how a person will respond to stress. O'Connor (2002) provides some interesting findings in regard to how Type A and Type B personalities act differently in the same situations. The author notes several differences, such as a Type A person appears to have more difficulty accepting the fact that they had a heart attack than a Type B; Type B persons are more prone to depression; Type A are more prone to anxiety; and so forth. What is interesting is that personality type has a direct influence on the person’s

behavior and environment, which come together to be determinants in their overall health and quality of life (O'Connor, 2002).

### **Emotional Intelligence**

Goleman (1995) introduced the concept of emotional intelligence, providing evidence that there is a direct connection between how a person is able to manage emotion and what he called chemical dumps – active *fight or flight* response. Goleman (1998) explains that emotional intelligence can be measured by the degrees a person can present the following core skills: positive, motivated, empathetic, conscientious, and socially competent. The greater the person's ability in each area, the higher their emotional intelligence. Goleman (1998) explains that emotional intelligence is a better predictor of an employee's ability to perform in a workplace than IQ. He also mentions that emotional intelligence can be learned, whereas IQ is often locked in place.

Emotional intelligence has also been linked directly to positive health. Cohen et al (2003) provide evidence that a person who is presenting positive emotions will have fewer colds, because positive emotions assist in combating stress.

### **Classical Conditioning**

Pavlov (1960) is the father of stimulus-response psychology. His work taught the world the concept called classical conditioning. Pavlov (1960) explains that this is when a neutral stimulus becomes conditioned to be something pleasant or unpleasant. In the case of bad stress, this model suggests a person can become conditioned to avoid situations that increase stress. For example, having a bad experience with a peer leads the person to taking the long way to their desk, and this avoidance leads to their being chronically late. Often, the person is able to process this behavior as not logical or in their best interest, but they still fall victim to this conditioning. How a person becomes conditioned in the workplace can have major impact on their day-to-day stress. Many people do not know that they can break this classical conditioning through interaction and education. It is clear that the more negative conditioning of a person, as well as the less awareness about classical conditioning, the greater their stress and more at risk they would be for illness and disease.

### **Trait: Optimism vs. Pessimism**

People who are generally pessimistic typically expect the worst to happen to them, and they can be known to look for the worst (Seligman, 2000). The author goes on to explain that on average a person who lives daily in a pessimistic state will have more anxiety, stress, and potential health issues than a person who is optimistic. Optimistic people have the gift of positive reappraisal (Seligman, 1998). The author adds this is where a person has the skill set to look for the good in life events, and to look for the learning, opportunity, and possibility. Based on Seligman's work, it is clear that there is a potential benefit for living life in an optimistic state for processing life stressors.

## **Observational Learning**

People are learning machines, but they can learn good and bad. Vicarious learning (also known as observational learning), developed by Bandura (1997), teaches that all human learning can originate from observing another human being's behavior. He adds that this can be done without the person necessarily performing the behavior or receiving any kind of reward (positive or negative). This is important, because people can learn both good and bad habits in the workplace. For example, complaining about the workplace and being negative about work can be learned from observing others. This example is one of the many negative habits a person could form from observing others in the workplace. The point is that these kinds of bad habits have the potential for adding to daily stress levels. Bandura's work suggests the health benefits of having positive role models in the workplace who model healthy living and positive behaviors.

## **Self-Efficacy**

Bandura (2000) also taught the world a person would benefit positively by developing their self-efficacy. This is the person's internal belief that they can wake up in the morning and be able to get through the day effectively. To do this, Bandura stated that the person needs to have the self-competencies (knowledge and skills) to carry out the task to be successful. The by-product of this is what is known in pop psychology as self-esteem. It is plausible to make the assumption that the more self-efficacy a person has that is modeled in a positive and non-threatening manner, the less stress and conflict they would have compared to a person who was questioning their abilities each and every day in the workplace.

## **Learned Helplessness**

Feeling powerless in one job can set a person on a road to developing what is called learned helplessness. Petri (1997) states, "Learned helplessness can be defined as a psychological state involving a disturbance of motivation, cognitive processes, and emotionality as a result of previously experienced uncontrollability on the part of the organism" (pp. 175-176). It is clear a person in this state would be living with stress and risk associated with chronic and prolonged stress.

Seligman (1988) teaches that learned helplessness is a serious motivational problem because, for example, if a person failed in a task in the past, they may believe that they are incapable of ever being successful in the future. Milkulincer (1994) builds on Seligman's thinking and suggests that learned helplessness can negatively impact self-esteem, the individual's cognitive flexibility, and creativity, and leave them in a weakened emotional state such as depression. When a person evolves to these emotional states and feels they are a failure, their ability to cope with future stress is reduced.

The following point provides insight as to why companies will benefit from becoming more in tune with the direct impact managers' interactions can have on an employee's wellness, motivation, and retention. Holmes (2002) reports, "The myth that money is the answer to

motivational and productivity problems is pervasive throughout business. A recent Gallup study of 2 million employees reports that the number one reason employees quit their jobs is dissatisfaction with their manager. Pouring money into more ‘carrots’ isn’t the answer either” (¶. 4).

Chapter 4 provided an overview of eight independent variables that influence how stress affects a person. Understanding the influence of each can assist a person to manage stress better. Chapter 5 will introduce the relationship between stress and frustration. One of the consequences of stress is frustration, which on its own can create a host of problems for a person, such as: social, personal, professional, and legal difficulties.

## **Chapter 5 – Relationship between Stress and Frustration**

One potential consequence of stress is the perception of loss of control. Berkowitz’ (1988) research supports this notion. This author explains that when a person is experiencing stress and is frustrated, it is predictable they will also feel a loss of control. One potential by-product of being in a loss-of-control mindset is cognitive dissonance. Petri (1997) states, “Cognitive dissonance as a concept stresses that we attempt to maintain constancy of our beliefs, attitudes, and opinions with our overt behavior” (p 284). This is an attempt to project control to the world, which may result in a person becoming frustrated.

Frustration is a symptom of most stress situations, especially in a person who is not aware of the connection between stress and frustration. Oatley & Duncan (1994) explain that frustration is an intense emotion that if not controlled has the potential to become aggression and anger. When a person is frustrated, Glasser (1984) teaches that the person will continue to behave in an attempt to regain a sense of control to eliminate the frustration (difference between what the person wants and has).

Ellis (1980) suggests that when stressed, one will have a lower frustration tolerance. He goes on to explain that this is when the person has less patience and resistance to external stressors than in their pre-stress state. Finally, he promotes the concept that one of the root causes of frustration is an individual’s irrational beliefs (thinking). To help a person lower their frustration and stress levels, Ellis (1980) says this person would need to learn how to overcome their irrational thinking, which would help increase their frustration tolerance and assist them to cope with stress.

Glasser (2002) teaches that when a person is stressed and frustrated they are driven internally to find a behavior that will help them perceive a sense of control. In fact, this author goes on to suggest that a human being has no choice except to behave. What behavior they choose is ultimately the person’s responsibility and choice. In periods of prolonged and intense bad stress, this insight from Glasser (2000) can be life changing when a person learns that they have a choice over their behavior.

One of the behaviors associated with frustration is aggression, which is the precursor for acts of anger and violence. In the corporate workplace, it can put people in danger. Besides this obvious risk of hurting others, anger can lead to illness, disease, and even death (Williams & Williams, 1993).

Gershaw (1997) teaches there are three kinds of aggression; 1) Displaced aggression, when a person does not feel confident or safe to deal directly with their source of frustration (e.g., manager) and redirects their frustration to another (e.g., takes it out at home with their spouse); 2) Direct aggression, when a person directs their aggression directly to the person they are frustrated with and has the potential to escalate to anger; 3) Withdrawing or escaping aggression, when a person takes steps to withdraw or escape a situation to deal with stress.

The above provides evidence that with stress, frustration, and aggression come inter-relationship conflict. Plotnik (2002) provides three examples of how a person may deal with inter-relationship conflict:

1. **Approach-approach conflict** – This is when a person has the choice between two alternatives that regardless of the choice the consequences are going to be pleasurable.
2. **Approach-avoidance conflict** – This is the opposite of approach-approach conflict. In this situation, both choices will lead to an unwanted sequence.
3. **Approach-avoid conflict** – This situation is challenging and complicated because in this kind of conflict there is an opportunity for both a pleasurable and unwanted consequence.

Stress is the root cause of conflict, and conflict will lead to increased stress. This cycle of stress, frustration, aggression, and conflict can create a vicious loop that is often hard to stop without motivation to take control of one situation and education (Glasser, 1984). We have already introduced the potential risk of long-term stress. It is obvious that frustration, anger, and conflict, if prolonged, can negatively impact a person's overall health, since these behaviors are rooted in stress.

It is outside the scope of this paper to go into depth on research of frustration and anger in the workplace. However, it is evident that workers who are highly stressed, frustrated, and aggressive are at risk of societal consequences, such as termination from job, even jail. For companies, frustration, aggression, and anger are a huge drain on production, which is expensive. For example, there is research that supports the fact that 30% to 40% of a manager's day is spent on addressing and resolving conflict (Watson & Hoffman, 1996). Gianakos (2002) states, "It would be in the best interests of any organization to identify anger-provoking incidents that are unique to their workplace and to design interventions particularly suited to address these situations" (p. 9). It is evident that lowering conflict within the workplace would decrease stress, but the first challenge will be for professionals to learn how to better manage their stress levels.

Chapter 5 introduced the connection of stress and frustration. Chapter 6 will introduce burnout.

## **Chapter 6 – Stress and Burnout**

Burnout can be defined as “a state of physical, emotional, and mental exhaustion; as well as a syndrome of emotional exhaustion, depersonalization of others, and a feeling of reduced personal accomplishment” (Williams and Knight, 1994, p. 215). Burnout occurs as a direct result of prolonged and intense stress in the workplace. James & Gilliland (2001) explain that burnout, to the untrained eye, can be hard to detect until it is too late. The authors provide the following qualifiers of how burnout evolves: slow and insidious, rarely associated with one incident, related to chronic daily stress, often connected to past and present problems at work that continue to pile up with no long-term relief in sight. Burnout is the result of negative stress; any and all stress can lead to burnout.

Burnout connected to stress has a wide spectrum of symptoms, from mild energy loss to death. Individual understanding of burnout can be in the form of complete denial to full consciousness of the problem. Four indicators of the potential for burnout pointed out by Maslach (1982): 1) Behaviorally – marked departure from the individual’s normal daily habits; 2) Physically – individual presents as being worn out and drained day in and day out; 3) Interpersonally – relationships both inside and outside impacted negatively; 4) Attitudinally – the individual experiences a sense of loss and moral purpose for work.

### **Stages of Burnout**

Edelwich and Brodsky (1982) have delineated the following four stages of burnout:

- Stage 1: Enthusiasm – The individual enters their job with high hopes and unrealistic expectations.
- Stage 2: Stagnation – Occurs when the worker starts to feel that personal, financial, and career needs are not being met. Sometimes it may seem that less able colleagues are moving faster up the career ladder. If intrinsic and extrinsic reinforcement does not occur, the worker will move to the next stage of burnout.
- Stage 3: Frustration – Clearly indicates that the worker is in trouble; they begin to question efforts put forth as to their effectiveness, value, and impact in the face of ever-mounting obstacles. As burnout is contagious, it is necessary that the worker be directly confronted by arranging workshops or support groups to increase awareness of the burnout syndrome and generate problem solving as a group. These efforts may lead the way back to a tempered form of enthusiasm or, if not effective, the final stage of burnout.
- Stage 4: Apathy – This is chronic indifference to the situation. At this stage, the individual is in a state of disequilibrium (inability to control emotions or

cognitions) and immobility (inability to behave up to their potential due to being in a state of stress); they will also likely be in a state of denial and have little objective understanding of what is occurring. Therapy is necessary if reversal is going to take place.

James & Gilliland (2001) suggest that responsibility for burnout lies also not only with the individual but with the organizations. For example, it is of value for companies to know the following: 1) workers who score high on the burnout index often feel they have little impact on *policies and procedures of the organization*; 2) workers are unclear of job descriptions; 3) workers are unclear of department's purpose or objectives; 4) workers have large work demands with little input on how to implement and manage daily workloads; 5) workers have a sense of restriction in regard to communication within and outside the organization; 6) workers have a sense that communications within the corporation overall are ineffective. Burnout needs to be addressed by companies because it can be infectious and impact other workers negatively (James & Gilliland, 2001).

Chapter 6 provided an introduction to burnout. Chapter 7 will provide a final recommendation and conclusion.

## **Chapter 7 – Recommendation & Conclusion**

The main recommendation for any and all corporations is to become aware of the extent of the stress epidemic inside their walls. For companies to be proactive, they first need to make a commitment to reducing stress in their corporate culture. From there, they need to work to develop a long-term strategy to reduce stress. If a corporation does not have the expertise in-house, it needs access to an expert on stress to assist it to design a blueprint action plan to help individuals to develop skills, as well as to assist the corporation to develop a healthy workplace.

Davis & Palladino (2000) promote the concept that for a healthy workplace each person would need to take ownership for their own health and develop a set of healthy coping strategies for dealing with daily stress. Green & Shellenberger (1990) promote the concept of the biopsychosocial model, which points out the importance of a healthy lifestyle for managing daily stress.

In conclusion, the purpose of this paper was to provide an introduction to the stress epidemic in corporate America; discuss the scope of the epidemic of stress; introduce stress theories and *fight or flight*; explore some reasons why some people are more impacted by stress than others; discuss the relationship between stress and conflict; and define burnout. What is clear is that stress is an epidemic in the United States, which if left alone will continue to negatively impact professionals' quality of life and corporate bottom lines.

## References

- Adinger, A. (2003). *Pitt neurologist says migraine headaches under-diagnosed*. Retrieved March 10, 2004, at [http://www.discover.pitt.edu/media/pcc030324/migraines\\_underdiagnosed.html](http://www.discover.pitt.edu/media/pcc030324/migraines_underdiagnosed.html).
- Ali, M. (1999). *The cortical monkey and healing*. Bridgeway, Sausalito, CA: Institute of Preventive Medicine.
- American Cancer Society. (2004). Retrieved March 23, 2004, at <http://www.cancer.org/docroot/home/index.asp>.
- American Diabetes Society (2004). *Research stats on population diabetes*. Retrieved on March 30, 2004, at <http://www.diabetes.org/home.jsp>.
- American Lung Society (2004). *Research cost of asthma*. Retrieved on March 30, 2004, at <http://www.lungusa.org/>.
- Bandura, A. (1986). *Social foundation of thought and action: A social cognition theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.
- Bandura, A. (2000). Cultivate self-efficacy for personal and organizational effectiveness. In E. A. Locke (Ed.), *Handbook of principles of organization behavior*. Oxford, UK: Blackwell.
- Basic Behavior Science Task Force of the National Advisory Mental Health Council. (1996). Basic behavioral science research for mental health: Vulnerability and resilience. *American Psychologist*, 51, 22-28.
- Berkowitz, L. (1990). On the formation and regulation of anger and aggression. *American Psychologist*, 45 (4), 494-503.
- Bryant, R. A., & Allison G., Harvey, A. G. (2000). *Acute stress disorder: A handbook of theory, assessment, and treatment*. Washington, DC: American Psychological Association.
- Business Communications Company. (2003). *New treatments and advances in immune diseases*. Retrieved March 10, 2004, at <http://www.bccresearch.com/editors/RC-141N.html>.
- Centers for Disease Control and Prevention (2004). *Research stats on population obesity*. Retrieved on March 30, 2004, at <http://www.cdc.gov/>.
- Chen, E., Fisher, E. B., Bacharier, L. B., & Strunk, R. C. (2003). Socioeconomic status, stress, and immune markers in adolescents with asthma. *Psychosomatic Medicine* 65: 984-992.
- Clarke, G. (nd). *Stress Management*. Retrieved March 22, 2004, at <http://siri.uvm.edu/ppt/stressmanage/tsld001.htm>.
- Cohen, S. & Williamson, G. M. (1991). Stress and infectious disease in humans. *Psychological Bulletin*, 109, 5-54.
- Cohen, S., Doyle, W. J. & Skone, D. P. (1999). Psychological stress, cytokine production, and severity of upper respiratory illness. *Psychosomatic Medicine*, 61: 175-180.
- Cohen, S., Doyle, W. J., Turner, R. B., Alper, C. M. & Skoner, D. P. (2003). Emotional Style and Susceptibility to the Common Cold. *Psychosomatic Medicine*, 65: 652-657.

- Cohen, S., Hamrick, N., Rodriguez, M. S., Feldman, P. J., Rabin, B. S. and Manuck, S. B. (2002). Reactivity and vulnerability to stress-associated risk for upper respiratory illness. *Psychosomatic Medicine*, 64:302-310.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- Cohen, S., Miller, G. E. & Rabin, B. S. (2001). Psychological stress and antibody response to immunization: a critical review of the human literature. *Psychosomatic Medicine* 2001 63: 7-18.
- Cohen, S, Kessler, R. C. & Underwood G. L. (Eds.) (1995). *Measuring stress: A guide for health and social scientists*. New York, NY: Oxford.
- Coon, D. (2002). *Psychology; A journey*. Pacific Grove, CA: Thomson Learning.
- Cooper, C. L. & Maggie Watson, W. (Eds.) (1991). *Cancer and stress: Psychological, biological and coping studies*. New York, NY: John Wiley & Sons; (October 1991).
- Covey, S. (1992). *The seven habits of highly effective people*. London, UK: Simon and Schuster.
- Davis, S.F., and Palladino, J.J. (2000). *Psychology* (3rd ed.). Upper Saddle River, NJ: Prentice Hall.
- De Fruyt, F. & Denollet, J. (2002). Type D personality: A five-factor model perspective. *Psychology & Health*, 1, 5, 671-684.
- Edelwich, J. & Brodsky, A. (1982). Training guidelines: Linking the workshop experience to needs on and off the job. In W. S. Paine (Ed.). *Job stress and burnout*. Newbury Park, CA: Sage.
- Ellis, A. (1980). *Growth through thought*. Palo Alto, CA: Science and Behavior Books.
- Everhart, J. E. (Ed.) (1994). *Digestive diseases in the United States: Epidemiology and impact*. (NIH Publication No. 94-1447). U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Washington, DC: U.S. Government Printing Office.
- Freud, S. (1926). Inhibitions, symptoms and anxiety. In Strachey, J. (translated and Eds, 1959). *The standard edition of the complete psychological works of sigmund freud*, Vol. 20. pp. 75-175. London, England: Hogarth Press.
- Friedman, H. S., & Schustack, M. W. (2003). *Personality: Classic theories and modern research*. Boston, MA: Allyn and Bacon.
- Gershaw, D. A. (1997). Dealing with Frustration. Arizona Western College, Psychology Department. Retrieved March 30, 2004, from <http://www3.azwestern.edu/psy/dgershaw/lor/frustration2.html>.
- Gianakos, I. (2002). Issues of anger in the workplace: do gender and gender role matter? *Career Development Quarterly*.
- Glasser, W. (1984). *Control theory*. New York, NY. Harper Collins.
- Glasser, W. (2000). *Choice theory*. New York, NY. Harper Collins.

- Goebel, M. U., Mills, P. J., Irwin, M. R., & Ziegler, M. G. (2000). Interleukin-6 and tumor necrosis factor- $\alpha$  production after acute psychological stress, exercise, and infused isoproterenol: differential effects and pathways. *Psychosomatic Medicine*, 62: 591-598.
- Goleman, D. (1995). *Emotional intelligence*. New York, NY: Bantam.
- Goleman, D. (1998). *Emotional intelligence in the workplace*. New York, NY: Bantam.
- Gottlieb, B. H. (1997). *Coping with chronic stress*. New York, NY: Plenum Publishers.
- Green, J., & Shellenby, R. (1990). *The dynamic of health and wellness: A biopsychosocial approach*. Fort Worth, TX: Holt, Rinehart & Winston.
- Holmes, M. (2002). The Secret of Motivating and Keeping Sales Producers. Retrieved March 30, 2004, at: <http://www.transactionworld.com/articles/2001/september/hiring1.asp>.
- James, R. K. & Gilliland, B. E. (2001). *Crisis intervention strategies* (4<sup>th</sup> ed). Pacific Grove, CA: Brooks/Cole Publishing Company.
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Psychoneuroimmunology and psychosomatic medicine: back to the future. *Psychosomatic Medicine*, 64: 15-28.
- Lazarus, R. S. (1993). From psychology stress to the emotions: A history of changing outlooks. In L. W. Porter and M. R. Rosenzweig (Eds.). *Annual review of psychology*, 44, 1-21.
- Lazarus, R. S. (1999). *Stress and emotion*. New York, NY: Springer Publisher.
- Lazarus, R. S. (2000). Evolution of a model of stress, coping and discrete emotion. In V. R. Rice (Ed.), *Handbook of stress, coping and health*. Thousand Oaks, CA; Sage.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York, NY: Springer.
- Logan, H. L., Lutgendorf, S., Kirchner, H. L., Rivera, E. M., & Lubaroff, D. (2001). Pain and immunologic response to root canal treatment and subsequent health outcomes. *Psychosomatic Medicine*, 63: 453-462.
- Lurie, K. (2003). *Stress changes your brain*. Retrieved March 10, 2004, from [http://www.sciencentral.com/articles/view.php3?language=english&type=&article\\_id=218391988](http://www.sciencentral.com/articles/view.php3?language=english&type=&article_id=218391988).
- Maslach, C. (1982). *Burnout: The cost of caring*. Englewood Cliffs, NJ: Prentice-Hall.
- McEwen, B. S. (2000). Effects of adverse experiences for brain structure and function. *Biological Psychiatry*, 48, 721-731.
- McQuillan, S. (1995). Irritable bowel: the "brain" connection. *American Health*, 14(9), 64.
- Milkulincer, M. (1994). *Human learned helplessness: A coping perception*. New York, NY: Plenum Press.
- Miller, A. H. (1998). Neuroendocrine and immune system interaction in stress and depression. *Psychiatric clinics of north america*, 21(2), 443-463.
- Miller, G. E., Cohen, S., Pressman, S., Barkin, A., Rabin, B. S. & Treanor, J. J. (2004). Psychological stress and antibody response to influenza vaccination: when is the critical period for stress, and how does it get inside the body? *Psychosomatic Medicine*, 66: 215-223.

- Mitchell, J. T. & Everly G. S. Jr. (1995). *Critical incident stress: The basic course workbook*. Ellicott City, MD: International Critical Incident Foundation.
- National Committee for Quality Assurance (2003). *Health plan employer data & information set. Vol. 2, Technical specifications*. Washington, DC: National Committee for Quality Assurance.
- National Institutes of Health (1998). Arthritis Prevalence Rising as Baby Boomers Grow Older Osteoarthritis Second Only to Chronic Heart Disease in Worksite Disability. Retrieved March 10, 2004, at [http://www.niams.nih.gov/ne/press/1998/05\\_05.htm](http://www.niams.nih.gov/ne/press/1998/05_05.htm).
- New York Department of Health (1999). Physical Inactivity and Cardiovascular Disease. Retrieved March 10, 2004, at <http://www.health.state.ny.us/nysdoh/chronic/cvd.htm>.
- Oatley, K. & Duncan, E. (1994). The experience of emotions in everyday life. *Cognition and emotion*, 8 (4), 369-381.
- O'Connor, J. (2002). Type A, Type B, and the Kleinian positions: Do they relate to similar processes? *Psychoanalytic Psychology*, 19(1), 95-117.
- Oxford English Dictionary (10<sup>th</sup> ed) (2002). *Oxford University Press* (Editor). London, UK: Oxford University Press. Pacific Grove, CA: Brooks/Cole Publishing Company.
- Pavlov, I. P. (1960). *Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex* (G. V. Anrep Trans.). New York, NY: Dover. (Original translation published 1927.)
- Petri, H. (1997). *Motivation: Theory, research and applications (4th Ed)*. Pacific Grove, CA: Brooks/Cole.
- Plotnik (2002). *Introduction to psychology (6<sup>th</sup> ed)*. Pacific Grove, CA: Thomson Learning.
- Princeton Survey Research Associates (1997). *Labor day survey: state of workers*. Princeton, NJ: Princeton Survey Research Associates.
- Reichheld, F. F. (1996). *The loyalty effect*. Boston, MA: Harvard Business School Press.
- Reynolds, L. K. (2004). Employers Seek Healthier Ways to Approach Sick Time *Chicago Tribune*. Retrieved March 22, 2004 at <http://www.chicagotribune.com/services/site/premium/access-registered.intercept>.
- Rotter, J.B. (1954). *Social learning and clinical psychology*. Englewood Cliffs, NJ: Prentice-Hall.
- Sauter, S., Hurrell, J., Murphy, L. & Levi, L. (1997). Psychosocial and organizational factors. In: Stellman J, (Ed). *Encyclopedia of Occupational Health and Safety*. Vol. 1. Geneva, Switzerland: International Labour Office, pp. 34.1-34.77.
- Savard, J., Laroche, L., Simard, S., Ivers, H. & Morin, C. M. (2003). Chronic insomnia and immune functioning. *Psychosomatic Medicine*, 65: 211-221.
- Schiraldi, G. R. (2000). *Post-traumatic stress disorder sourcebook*. New York, NY: McGraw-Hill.
- Seligman, M. E. P. (1988). Learned helplessness: Depression, development and death. In Stipek, D. E. P. *Motivation to learning*. Boston, MA: Allyn & Bacon.
- Seligman, M. E. P. (1989). *Helplessness*. New York, NY: Freeman.

- Seligman, M. E. P. (1998). *Learned optimism*. Second edition. New York, NY: Simon and Schuster.
- Seligman, M. E. P. (2002). *Authentic happiness: Using the new positive psychology to realize your potential for lasting fulfillment*. New York, NY: Free Press/Simon and Schuster.
- Selye, H. (1976). *Stress and life*. New York, NY: McGraw-Hill.
- Selye, H. (1980). *Selye's guide to stress research*, Volume 1. New York, NY: Van Nostrand Reinhold.
- Selye, H. (1993). History of the stress concept. In L. Goldberger & S. Breznitz (eds), *Handbook of stress: Theoretical and clinical aspects* (2nd ed). New York, NY: Free Press.
- Surgeon General (n.d). *The Costs of Mental Illness*. Retrieved March 10, 2004, at <http://www.surgeongeneral.gov/library/mentalhealth/chapter6/sec2.html>.
- Talbott, S. M., & Kraemer, W. (2000). *The cortisol connection: Why stress makes you fat and ruins your health - And what you can do about it*. New York, NY: Hunter House.
- Taylor, S. E. (1991). *Health psychology* (2<sup>nd</sup> ed). New York, NY: McGraw-Hill.
- Taylor, S. E. (1995). *Health psychology* (3rd ed). New York, NY: McGraw-Hill.
- Taylor, S. E., Repetti, R. & Seeman, T. (1997). Health psychology: What is an unhealthy environment and how does it get under the skin? *Annual Review of Psychology* (Vol 48). Palo Alta, CA: Annual Reviews.
- U.S. Census Bureau, Population Division (March 10, 2004). *U.S. and World Population Clocks – POPClocks*. Retrieved March 10, 2004, at <http://www.census.gov/main/www/popclock.html>.
- Vecchio, R. P. (1991). *Organizational behavior*. Montreal, Canada: The Dryden Press.
- Watson, C. and Hoffman, R. (1996). Managers as negotiators. *Leadership Quarterly*, 7 (1).
- Welberg, L.A., Seckl, J.R., & Holmes, M. C.(2001). Prenatal glucocorticoid programming of brain corticosteroid receptors and corticotrophin-releasing hormone: possible implications for behaviour. *Neuroscience*. 104, 71-9.
- White, J. M. & Porth, C. M. (2000). Evolution of a model of stress, coping and discrete emotions. In V. R. Rice (Ed). *Handbook of stress, coping, health*. Thousand Oaks, CA: Sage.
- Williams, B. K., & Knight, S. M. (1994). *Health for life: wellness and the art of living*. Pacific Grove, CA: Brooks/Cole Publishing Company.
- Williams, R. & Williams, V. (1993). *Anger kills*. New York, NY: Harper Perennial.
- Wimbush, F. B. & Nelson, M. L. (2000). Stress, psychosomatic illness, and health. In V. R. Rice (ed.), *Handbook of stress coping and health*. Thousand Oaks, CA: Sage.
- Wolfe, E. L., Barger, A. C., Benison, S. (2000). *Walter B. Cannon, science and society*. Boston, MA: Harvard University Press.