Running Head: Health Psychology

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Health psychology is a relatively recent branch of psychology, formalized in the late 1970s. It adopts a definition of health as "a complete state of physical, mental, and social wellbeing, and not merely the absence of disease or infirmity" (World Health Organization, 1948). As such, the field is guided by a biopsychosocial model that addresses health promotion and maintenance, including the development and practice of health habits; the prevention and treatment of illness; the etiology and correlates of health, illness, and dysfunction; and psychological perspectives on the healthcare system and the formulation of health policy. Thus, the field covers the psychological, social, and biological factors that lead to the enhancement of health, the prevention and treatment of illness, and the evaluation and modification of health policies in directions consistent with these underlying values (Taylor, 2009a).

Why did the field of health psychology develop? A primary factor was the change in illness patterns that occurred in the United States and other developed countries over the past century. There has been a shift in the major causes of morbidity and mortality, from acute disorders, such as tuberculosis, pneumonia, and infectious diseases, to chronic illnesses, especially heart disease, cancer, and diabetes[1]. These are diseases in which psychological and social factors are clearly implicated as causes. Diet, smoking, and lack of exercise contribute to the development of heart disease, diabetes, and some cancers, for example. Accordingly, these are also diseases in which psychological and social processes are heavily implicated in prevention, such as the need to modify health habits; communication patterns with healthcare providers; and adherence to treatment recommendations, among other issues. Chronic diseases are slow-developing disorders with which people live for a long time and that often cannot be

cured but rather managed by patient and healthcare provider collaborating together. How to make that collaboration successful is also a task of social psychologists interested in health psychology.

Social psychologists were some of the founding figures in health psychology and have made substantial contributions to such areas as the practice of health behaviors, stress and coping, adherence to treatment regimens, discoveries of the underlying causes of complex disorders, and the management of chronic diseases. This chapter addresses all of these topics, but begins with a framework for understanding stress, because stress and reactions to it are heavily implicated in the diseases of modernity that affect our population, and increasingly, other countries around the world as well.

Stress

Everyone has an intuitive appreciation of stress. It is being late for an important appointment, realizing you ran a stoplight and a hidden camera just took a picture of your license plate, or finding out that your parents need your help at home during exam time. Stress is formally defined as a negative emotional experience accompanied by predictable biochemical, physiological, cognitive, and behavioral changes directed either toward altering the stressful event or accommodating to its effects (Baum, 1990).

Although researchers initially focused on stressful events themselves, called stressors, increasingly researchers have recognized that stress is the consequence of a person's appraisal processes. Primary appraisal determines the meaning of the event (Lazarus and Folkman, 1984). Events may be perceived as positive, neutral, or negative in their consequences and are further appraised for their possible harm, threat, or challenge. Secondary appraisal involves the assessment of one's coping abilities and resources, namely whether they will be sufficient to meet the harm, threat or challenge of the event. Ultimately, the subjective experience of stress is

a balance between primary and secondary appraisal. When people feel able to deal with difficult situations, they experience a sense of challenge, but when resources are perceived to be insufficient to address the event, they experience stress. Stress, then, results from the process of appraising events as harmful, threatening, or challenging, of assessing potential responses, and of responding to those events.

Models of Stress

Several important theoretical models have guided the study of stress. The first was Walter Cannon's (1932) description of the **fight or flight response**. Cannon proposed that when an organism perceives a threat, the body is rapidly aroused and motivated via the sympathetic nervous system and the endocrine system to attack the threat or to flee from it. In current times, fight refers to aggressive or assertive responses to stress, whereas flight may be manifested in social withdrawal or withdrawal through substance use, such as alcohol or drugs. On the one hand, the fight or flight response is adaptive because it mobilizes the organism for a quick response, but on the other hand, it may be harmful because long-term stress disrupts emotional and physiological functioning and, as will shortly be noted, lays the groundwork for health problems.

Another seminal contribution to research on stress was Hans Selye's (1956) work on the **general adaptation syndrome**. Selye exposed rats to a variety of stressors and observed their physiological responses. To his surprise, all stressors, regardless of type, produced essentially the same pattern of physiological changes, which led to an enlarged adrenal cortex, shrinking of the thymus and lymph glands, and ulceration of the stomach and duodenum. From these observations, he argued that when an organism confronts a stressor, it mobilizes itself for action. Selye termed this pattern of responses the general adaptation syndrome and maintained that it is nonspecific with respect to the stressor. The general adaptation syndrome consists of three

phases. In the first phase, alarm, the organism is mobilized to meet the threat. In the second phase, resistance, the organism makes effort to cope with the threat, as through confrontation. The third phase, exhaustion, occurs if the organism fails to overcome the threat and depletes its physiological resources in the process of trying. Over time, with repeated or prolonged exposure to stress, wear and tear on biological systems lays the groundwork for disease.

A third guiding model in the field of stress builds on the observation that animals, whether human or nonhuman, do not merely fight, flee, or grow exhausted in response to stress; they also affiliate with each other and protect their offspring in times of stress. Taylor and colleagues (Taylor, Klein et al., 2000) termed this pattern **tend and befriend**. The theory maintains that, in addition to fight or flight, humans respond to stress with social affiliation and protective behavior toward offspring. These responses appear to particularly characterize women's responses to stress, although men also affiliate in response to stress.

Tend and befriend has origins in evolutionary theory and maintains that during the time that human responses to stress evolved, men and women faced somewhat different adaptive challenges, which led to different responses to threat. Whereas men were responsible for hunting and protection, women were responsible for foraging and childcare. Because these activities were largely sex-segregated, women's responses to stress would have evolved so as to protect not only the self but offspring as well. Whereas fight or flight is a mechanism that addresses individual self protection, tend and befriend is a response to stress that benefits both the self and offspring. That is, the chances that both self and offspring will survive a threat unscathed are greatly enhanced when one comes together with a social group for joint protection and comfort. Like the fight or flight mechanism, tend and befriend may depend on underlying biological mechanisms, in particular the hormone oxytocin and endogenous opioid peptides. Oxytocin acts as an impetus for affiliation (Taylor, Gonzaga et al., 2006) and induces levels of calm and

relaxation (e.g., Light, Grewen, & Amico, 2005), responses that may depend on downstream opioid peptides.

Biological Bases of Stress Responses

The underlying physiology of the stress response depends heavily on two interrelated stress systems, namely the sympathetic adrenomedullary (SAM system) and the hypothalamic pituitary adrenal (HPA) axis. Stress engages sympathetic arousal, which leads to the secretion of epinephrine and norepinephrine. These catecholamines, in turn, lead to increased blood pressure, heart rate, sweating, and constriction of blood vessels, among other changes. The HPA axis releases corticotrophin releasing factor (CRF), which stimulates the pituitary to secrete adrenocorticotropin hormone (ACTH), which in turn, stimulates the adrenal cortex to release glucocorticoids, including cortisol. Cortisol acts to conserve stores of carbohydrates and helps control inflammation in the case of injury. It also helps restore the body to a steady state following stress.

Although these systems are protective on the short term, over the long term, repeated or chronic activation of these systems can compromise their functioning. A concept that addresses this damage is **allostatic load** (McEwen & Stellar, 1993). Allostatic load refers to the fact that physiological systems fluctuate to meet demands from stress, a state called allostasis, but over time, the physiological costs of chronic exposure to fluctuating or heightened neural or neuroendocrine responses increases, and allostatic load builds up. Signs of allostatic load, that is the long-term costs of chronic or repeated stress, include decreases in cell-mediated immunity, the inability to shut off cortisol in response to stress, lowered heart rate variability, elevated epinephrine level, a high waist-to-hip ratio reflecting abdominal fat, low hippocampal volume (which is believed to result from repeated stimulation of the HPA axis), problems with memory (an indirect measure of hippocampal functioning), high plasma fibrinogen, and elevated blood

pressure. Most of these changes occur over the lifespan naturally, and so allostatic load may be thought of as accelerated aging of the organism in response to stress. Over time, this wear and tear leads to susceptibility to chronic illnesses and an increased risk of death (Karlamangla, Singer, & Seeman, 2006). This buildup interacts both with genetically-based risk factors and with lifestyle factors, and so if people cope with stress via a high fat diet, less frequent exercise, or smoking, for example, the buildup of allostatic load may be hastened.

Although the proceeding discussion may be an unexpected coverage of more biology than the average social psychologist wants, it is increasingly difficult to do good health psychology research without some awareness of these systems and the biological models that guide them – hence, this background.

What Makes Events Stressful

Although events are not inherently stressful, some events are more likely to be appraised as such than others. **Negative events** produce more stress than positive events. Although both have the potential for causing stress, negative events bear a stronger relationship to both psychological distress and adverse physical symptoms than do positive ones.

Uncontrollable or unpredictable events are perceived to be more stressful than controllable, predictable ones. When people feel that they can predict, modify, or terminate an aversive event, or that they have access to someone who can, the event is experienced as less stressful.

Ambiguous events are often perceived as more stressful than clear cut events. When a potential stressor cannot be well defined, a person has difficulty taking action. He or she must instead devote energy to understanding the stressor. The ability to take confrontative action is usually associated with less stress and better coping.

Overloaded people are more stressed than people with fewer tasks to perform (e.g., Cohen & Williamson, 1988). People also appear to be more vulnerable to stress when stressful events occur in central life domains (Swindle & Moos, 1992).

The question arises whether people can adapt to stress. We all know people who seem to lead chronically stressful lives and yet, to all appearances, are none the worse for it. There is some evidence that people can habituate to stress, especially relatively low level stressors. Arguably, New York City is a stressful place to live just by nature of the traffic, noise, crowding, and other characteristics of the physical environment. Nonetheless, many people thrive and appear to habituate easily to this background stress. More serious ongoing stressors, however, such as a deteriorating marriage or a high-stress job, are more difficult to adapt to and impair cardiovascular, neuroendocrine, and immune system functioning, and thus lead to an increased risk for disease (Matthews, Gump, & Owens, 2001).

People are also perfectly capable of creating their own stress. Anticipating a stressful event, whether it occurs or not, can be as stressful as actually experiencing it. For example, studies of students anticipating examinations find that on days when students are worrying about the exam, their psychological and biological stress levels are as high as those seen during the exam itself (e.g., Sausen, Lovallo, Pincomb, & Wilson, 1992). There are reliable aftereffects of stress as well, such that performance and attention span are limited following a stressful event. Thus, the experience of stress is heavily psychological and can occur over a long time frame involving both the anticipation of stress as well as its aftermath.

On an extreme level, people who have been exposed to very serious stressors, such as childhood sexual abuse, rape, or wartime combat may experience post-traumatic stress disorder (PTSD), which may permanently alter stress regulatory systems and psychological functioning in

response to normal events. PTSD usually requires clinical intervention (e.g., Nemeroff et al., 2006).

Increasing evidence suggests that stress experienced in early life, especially from low childhood SES or a harsh early family environment marked by conflict or cold, non-nurturant behavior, can produce alterations in biological stress responses (Repetti, Taylor, & Saxbe, 2007). Early stress also disrupts the development of emotion regulation skills and social competence skills in ways that have lifelong effects on risk for mental and physical health disorders. By contrast, offspring that grow up in highly nurturant families typically develop good emotion regulation and social competence skills that help them cope with stress (e.g., Taylor, Lerner, Sherman, Sage, & McDowell, 2003a; Taylor, Lerner, Sherman, Sage, & McDowell, 2003b).

How is Stress Studied

Health psychologists have developed many ways to measure stress and assessing its effects on psychological and physical functioning. One common method is to bring people into the laboratory, expose them to short-term stressful events (such as counting backwards quickly by sevens or delivering an impromptu speech to an unresponsive audience), and observe the impact of that stress on their physiological, neuroendocrine, and psychological responses. This **acute stress paradigm** consistently reveals that people experience both psychological distress and strong indications of sympathetic activity and elevated cortisol (e.g., Kirschbaum, Klauer, Filipp, & Hellhammer, 1995). This stress paradigm has proved useful for identifying factors that moderate the stress response. For example, people react more strongly to these laboratory stressors if they also have chronic stress going on in their lives at well (Pike et al., 1997). By contrast, people who experience social support regularly on a daily basis react less strongly to these laboratory circumstances (e.g., Eisenberger, Taylor, Gable, Hilmert, & Lieberman, 2007).

Another useful paradigm intentionally exposes people to viruses, and then assesses whether they become ill and how ill they become as a function of how much stress they are experiencing and what coping abilities they have. Cohen and colleagues (1999), for example, measured levels of psychological stress in a group of adults, infected them with an influenza virus by swabbing their nose with cotton soaked in a viral culture, and measured their symptoms and the proinflammatory cytokine (IL-6) that may link stress through the immune system to illness. They found that people experiencing more stress had greater symptoms of illness and increased production of IL-6. However, people who were exposed to the virus but who reported having a supportive social environment were less likely to get ill, had less severe viral infections if they did, and recovered more quickly (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997).

Sometimes researchers want a general indication of background stress. Assessment of **stressful life events** can be a helpful method for this kind of research. Stressful life events range from cataclysmic ones, such as the death of a parent, to more mundane but problematic events, such as moving to a new home. In some research that uses this method, participants respond to standardized lists of stressful life events that have already been evaluated in terms of how much stress or change they typically cause and indicate how many they have experienced over a fixed period of time, such as the proceeding six months (e.g., Holmes & Rahe, 1967). In other cases, people are asked to indicate how much stress they have been through recently and list and rate the specific events. In both cases, research demonstrates a modest relationship between stress experienced and the likelihood of adverse health outcomes (e.g., Turner & Avison, 1992; Schroeder & Costa, 1984). However, as noted earlier, some people will appraise a particular event, such as being fired from work, as a catastrophe, whereas others may see it as an unexpected opportunity. Because people vary so much in what they consider to be stressful,

many researchers feel that perceived stress is a better indicator of experienced stress than instruments that assess particular events (Cohen, Kamarck, & Mermelstein, 1983).

Stress has also increasingly been studied in the environments in which people normally live. For example, most adults work, and work can be both a common source of stress in everyday life as well as a potentially preventable source of stress. Work-related factors that increase the experience of stress include work overload, namely feeling that one is required to work too long and too hard at too many tasks; role conflict, which occurs when a person receives conflicting information about work tasks or standards from different people; the inability to develop satisfying social relationships at work (Buunk, Doosje, Jans, & Hopstaken, 1993); a lack of perceived control over work-related tasks (e.g., Kivimäki et al., 2006); and difficulty finding or holding a job.

A particularly influential model of job stress draws on basic social psychological principles of demands and control. First developed by Karasek and colleagues (1981), the model details conditions that lead to job stress. Specifically, high psychological demands on the job coupled with little decision latitude (such as low job control) causes job strain, which in turn has been related to the development of coronary artery disease. When high demands and low control are combined with little social support at work, risk for coronary artery disease is even greater (Muhonen & Torkelson, 2003). High demand/high control jobs also entail a certain degree of stress but are often perceived to be challenging and exciting rather than stressful. Low demand/low control jobs tend to breed disaffection in the workplace because these jobs are typically boring. Low demand/high control jobs can be satisfying, but in a low key sort of way.

Considerable research has also been devoted to stress that involves juggling multiple roles. These issues are particularly acute for women, as the number of mothers of young children in the workforce is estimated to be more than fifty percent (Department for Professional

Employees, April 2006). Because concessions to working parents are rarely made at work, at least in the United States, and because mothers continually bear a disproportionate share of household and childcare tasks (Emmons, Biernat, Teidje, Lang, & Wortman, 1990), home and work responsibilities have the potential to conflict with each other.

Despite the potential for women to suffer role conflict and role overload by combining these roles, there appear to be protective effects of combining work and home responsibilities (Waldron, Weiss, & Hughes, 1998). Early work by Linville (1985) found that having multiple activities that contribute to personal identity and self esteem means that a setback in one arena can be buffered by feelings of competence or satisfaction in another domain. Although it is clear that juggling heavy responsibilities at work and home reduces the enjoyment of both sets of tasks and may contribute to depression, combining motherhood and employment can lead to women's improved wellbeing, improved self-esteem, feelings of self-efficacy, life satisfaction, and better health (Verbrugge, 1983; Weidner, Boughal, Connor, Pieper, & Mendell, 1997). Whether the effects of multiple roles are positive or negative depends heavily on the personal and social resources that are available. We next turn to coping resources and processes that may ameliorate the experience of stress.

Coping with Stress

How do people manage the stressful events that threaten to engulf them? In this section, we discuss individual differences that contribute to coping processes, general propensities to cope via approach or avoidance, and one of the most important resources that people possess, namely social support.

Coping is defined as the thoughts and behaviors that people use to manage the internal and external demands of situations that have been appraised as stressful (Folkman & Moskowitz, 2004; Taylor & Stanton, 2007). The relationship between coping and stress is a dynamic

process, occurring through a series of transactions between a person who has a set of resources, values and commitments, and a particular environment with its own resources, demands and constraints (Folkman & Moskowitz, 2004). As such, coping is not a one-time action that people undertake to deal with a specific stressor, typically, but is rather an evolving process.

Negativity, Stress, and Coping

Some people are predisposed to experience events as stressful. Negative affectivity is a dispositional, pervasive negative mood marked by anxiety, depression, and hostility (Watson & Clark, 1984). People who are high in negative affectivity (or neuroticism) are more likely to express distress and unhappiness across a wide range of situations (Gunthert, Cohen, & Armeli, 1999). Negative affectivity is related both to poor health and to the belief that one has poor health. For example, negative emotions influence the course of asthma, arthritis, ulcers, headaches, and coronary artery disease, among other disorders, and thus, negative affectivity has been considered the cornerstone of a "disease prone personality" (e.g., Friedman & Booth-Kewley, 1987). Negative affectivity is associated with elevated cortisol, and high levels of adrenocortical activity may provide a pathway linking negative affectivity to adverse health outcomes (Polk, Cohen, Doyle, Skoner, & Kirschbaum, 2005).

But negative affectivity may also make it difficult to assess illness, because people who are high in negative affectivity report more distressing physical symptoms, such as headaches, stomachaches, and various pains, especially when under stress, even if there is no evidence of an underlying physiological disorder (e.g., Cohen, Doyle, Turner, Alper, & Skoner, 2003). People high in negative affectivity may also use health services more, even when they do not need them, thereby contributing to the appearance, if not the reality, of illness (Cohen & Williamson, 1991).

Coping Resources

Positive emotional functioning has been associated with better mental and physical health (e.g., Cohen & Pressman, 2006; Pressman & Cohen, 2005). For example, a positive emotional style has been tied to lower cortisol levels (Polk et al., 2005), better responses to vaccinations (Marsland, Cohen, Rabin, & Manuck, 2006), and resistance to illness following exposure to a flu virus (Cohen, Alper, Doyle, Treanor, & Turner, 2006), among other healthful outcomes.

Related to a positive emotional style are several specific coping resources, including optimism, a sense of mastery or control, self-esteem, and related resources. Dispositional optimism (Scheier, Carver, & Bridges, 1994), typically assessed by the LOT-R, has been consistently tied to mental and physical health benefits (Segerstrom, 2007). Those who score high on this scale answer positively to such items as "Overall, I expect more good things to happen to me than bad." Optimists have a more positive mood, which may be physiologically protective. Optimism promotes more active and persistent coping efforts, which may improve long-term prospects for psychological adjustment and health (Segerstrom, Castañeda, & Spencer, 2003), and can speed recovery from illness and treatment (e.g., Scheier et al., 1989).

Psychological control or mastery involves the belief that one can determine one's own behavior, influence the environment, and bring about desired outcomes (Thompson, 1981). It is related to self-efficacy, which is the more narrow perception that one has the ability to take a specific action to obtain a specific outcome in a specific situation (Bandura, 1991). Control or mastery has been linked to a lower risk for mortality (e.g., Surtees, Wainwright, Luben, Khaw, & Day, 2006) and better asthma control (Chen, Fisher, Bacharier, & Strunk, 2003), among other beneficial health outcomes. So powerful are its effects that psychological control has been used extensively in interventions to promote good health habits and to help people cope with stressful events, such as surgery and other noxious medical procedures. For example, by creating control-based interventions that provide information, relaxation, and cognitive behavioral skills, such as

learning to think differently about the unpleasant sensations of a noxious medical procedure, patients are able to cope more successfully with medical tests and surgeries (Ludwick-Rosenthal & Neufeld, 1988).

Self-esteem and self-affirmation also aid effective coping, particularly at low levels of stress (Whisman & Kwon, 1993). In an experimental study, Creswell and colleagues (2005) assigned some people to focus on and write about their important values and other people to focus on less important values (a self-affirmation manipulation) (Steele, 1988). All participants then went through laboratory stressors, including mental arithmetic and delivering a speech to an unresponsive audience. Those who had affirmed their important personal values had lower biological responses to stress, and among those with high dispositional self esteem, experienced less psychological stress as well. Related resources include dependability, trust, lack of impulsivity, self confidence, a sense of coherence about one's life, and conscientiousness, all of which have also been found to buffer people against stress (see Taylor, 2009a, for a review).

The beneficial effects of individual differences in these and related psychosocial resources on health appear to be mediated via the lesser neuroendocrine and physiological reactivity that people experience in response to stress when they feel they have the resources to manage them (e.g., Taylor, Lerner, Sherman, Sage, & McDowell, 2003a). Coping resources can lead to lower levels of activation of brain regions implicated in stress responses, including the amygdala and the dorsal anterior cingulate cortex (Eisenberger et al., 2007), patterns of activity that affect physiological and neuroendocrine responding. Coping resources have also been tied to greater activity in cortical regions, including the ventrolateral prefrontal cortex and the medial prefrontal cortex, that have been implicated in the regulation of threat responses (Taylor et al., 2008).

Social Support

Social support is perhaps the most significant coping resource that people possess. It is the perception or experience that one is loved and cared for by others, esteemed and valued, and part of a social network of mutual assistance and obligations (Wills, 1991). Social support may assume any of several forms. Tangible assistance involves the provision of material support, such as services, financial assistance, or goods. Informational support from others helps people to understand a stressful event better and determine what resources and coping strategies must be mustered to deal with it. Emotional support is provided when a person is reassured by close others that he or she is a valuable individual who is cared for by others.

Although the types of support just described involve the actual provision of help or solace by one person to another, in fact, many of the benefits of social support come from the perception that social support is available; that is, people carry their support networks around in their heads. Indeed, when one receives help from another and is aware of it, self-esteem may be threatened because the act of social support suggests a dependence on others or potentially a need to reciprocate (Bolger, Zuckerman, & Kessler, 2000). When one receives help from another but is unaware of it, that help is most likely to benefit the recipient, a type of support called invisible support (Bolger & Amarel, 2007).

Without question, social support is the most health-promoting resource uncovered by health psychologists. It has health-protective effects on par with or exceeding such well-established predictors of health as lipid levels and smoking. And, correspondingly, people who are socially isolated (Hawkley, Burleson, Berntson, & Cacioppo, 2003), who are chronically shy (Naliboff et al., 2004), or who anticipate rejection by others (Cole, Kemeny, Fahey, Zack, & Naliboff, 2003) experience elevated mental and physical health risks. Social isolation is also a risk factor for early death for both humans and animals (House, Landis, & Umberson,1988).

Social support probably exerts its health protective effects by some of the same routes as other psychosocial resources do, that is, by reducing physiological and neuroendocrine responses to stress. For example, biological responses to laboratory stressors are more subdued typically when a supportive companion is present than when no companion is present (Christenfeld, 1997). One possible reason is that warm social contact can release oxytocin, which has been tied to lower stress responses (Grewen, Girdler, Amico, & Light, 2005). Even undergoing stressful events in the presence of a pet can keep heart rate and blood pressure lower and lead to faster physiological recovery following stress. Dogs appear to be more adept at providing social support than other pets (Allen, Blascovich, & Mendes, 2002).

Social support can lower the likelihood of illness, speed recovery from illness or treatment when it occurs, and reduce the risk of prolonged illness or risk of mortality due to serious disease (House, Landis, & Umberson, 1988; Rutledge, Matthews, Lui, Stone, & Cauley, 2003). A substantial literature attests to the mental and physical health benefits of perceived and actual social support (see Taylor, 2009b for a review).

Social support appears to have genetic bases in either the ability to construe social support as available or to establish supportive social networks (Kessler, Kendler, Heath, Neale, & Eaves, 1992). During stressful times these genetic predispositions may be activated, leading people to experience social support as available to them.

On the whole, the evidence for the beneficial effects of social support is overwhelming. It is beneficial during non-stressful as well as stressful times (direct effects hypothesis), but may be especially beneficial during periods of high stress (the buffering hypothesis). It is more effective when it matches the needs that a person has (the matching hypothesis; Cohen & McKay, 1984) than if the wrong person provides the wrong kind of social support (Dakof & Taylor, 1990). When would-be support providers fail to provide the kind of support that is

needed or react in an unsupportive manner, they actually aggravate the negative event. Negative interactions can have a more adverse effect on wellbeing than positive interactions can have on improving it (Rook, 1984).

There are significant gender and cultural variations in how social support is experienced or used. Women are somewhat more likely to draw on their social networks for coping with stress than men are. East Asians and Asian Americans appear to profit more from social support that is implicit, that is, achieved through the awareness of knowing that one is part of a network consisting of mutual obligations; European Americans, by contrast, appear to benefit from explicit social support, that is, actually making use of one's network to ask for help or comfort (Taylor, Welch, Kim, & Sherman, 2007). These qualifications notwithstanding, social support is a profoundly important resource that merits research attention and cultivation.

Coping Style

In addition to individual differences in resources, people have general ways of responding across situations that reflect coping styles, that is, general propensities to deal with stressful events in a particular way. Many frameworks for characterizing coping processes have been advanced (Skinner, Edge, Altman, & Sherwood, 2003). For example, coping strategies are often organized according to their intended function, such as directed toward resolving the stress (i.e., problem-focused coping) or palliating event-related distress (i.e., emotion-focused coping).

An important framework is approach-avoidance. Reflecting a core motivational construct in psychology (e.g., Davidson, Jackson, & Kalin, 2000), the approach-avoidance continuum characterizes coping efforts and maps easily onto broader theories of biobehavioral functioning. Examples of approach-oriented coping are problem solving, seeking social support, and creating outlets for emotional expression. Coping through avoidance includes both cognitive and behavioral strategies, such as the use of alcohol, drugs, or television to withdraw from stress.

Consistently, researchers find that the use of avoidance-oriented coping typically predicts elevated distress and less effective coping. Avoidance-oriented coping may preempt more effective active coping efforts, involve damaging behaviors, such as substance use, or induce intrusion of stress-related thoughts and emotions. Approach-based coping, by contrast, is typically associated with more beneficial health and mental health outcomes, and has been advanced as an explanation for the generally beneficial effects of psychosocial resources on health and mental health as well (Taylor & Stanton, 2007).

In addition to addressing coping resources and broad coping styles, health psychologists have measured specific coping strategies that people use when they are managing the stressful events of daily life. One widely-used measure developed by Carver and colleagues (Carver, Scheier, & Weintraub, 1989) is the COPE. It assesses the specific coping strategies of active coping, planning, positive reframing, acceptance, humor, religion, using emotional support from others, using instrumental support from others, self-distraction, denial, venting, substance use, behavioral disengagement, and self-blame. For example, a person might name a specific stressor and answer questions such as "I've been taking action to try to make the situation better", an item that assesses active coping. Perusal of these scales reveals that they map well onto the approach-avoidance continuum just described and also distinguish between social coping strategies and individual ones.

Many people are unable to develop effective coping strategies on their own, and so a variety of interventions have been developed to enable them to do so, including mindfulness training (e.g., Brown & Ryan, 2003), cognitive behavioral stress management interventions (e.g., Antoni et al., 2001), and writing interventions that encourage emotional expression (e.g., Pennebaker, 1997; Lepore & Smyth, 2002). For example, Burton and King (2008) assigned undergraduates to write either about a personal trauma, a positive life experience, or a control

topic for two minutes each day for two days. Both the trauma group and the positive experience group reported fewer health complaints during follow-up than the control condition. This intervention is especially notable not only for being theoretically-based, but for showing how a very brief intervention may provide benefits.

Modifying Health Risks

People are better able to deal with risks to their health and better able to avoid illness if they practice good health behaviors and adhere to their physicians' recommendations. These are areas to which social psychological theory and research has also made substantial contributions.

Health behaviors are behaviors undertaken by people to enhance or maintain their health. A health habit is a health behavior that is firmly established, often performed automatically without awareness, and often instilled during childhood. They may include wearing a seatbelt, brushing teeth, or consuming a healthy diet. The importance of health habits for good health cannot be overestimated. Sleeping seven to eight hours a night, not smoking, having no more than one or two alcoholic drinks each day, getting regular exercise, being no more than ten percent overweight, and maintaining a good diet that is modest in meat consumption and high in vegetables, fruits, and whole grains delay the onset of chronic diseases and mortality. Instilling good health habits such as these is the task of primary prevention.

Social Influence and Health Behaviors

Social influence processes are important for instilling and modifying health behaviors. Families, friends, and workplace companions may motivate either good or poor health behaviors depending on social opinion. For example, peer pressure often leads to smoking in adolescence, but may influence people to stop smoking in adulthood. Social networks are critical to such habits as smoking and obesity (Cristakis & Fowler, 2007; Cristakis & Fowler, 2008). In

addition, health habits are strongly affected by early socialization, especially the influence of parents as role models and those who control children's environments.

A number of teachable moments may be identified during which health behavior interventions are particularly likely to succeed. For example, many teachable moments arise in early childhood when children are covered by well baby care, and pediatricians can use these moments to teach new parents how to instill basic health habits. Early dental visits may be used to teach both parents and children the importance of correct brushing. First pregnancy is a teachable moment for modifying health habits such as diet and smoking, because many women are motivated to preserve the health of their unborn child. As such, they may be especially motivated to curb bad health habits at this time.

There are also predictable windows of vulnerability for health habits, many of which occur in junior high school, when students are first exposed to smoking, drugs, alcohol, and dietary choices outside of the control of their parents. Social psychologists have devised interventions implemented through the schools that can help students avoid the temptations that lead to these health-compromising behaviors (Evans, Powers, Hersey, & Renaud, 2006). For example, several such interventions make use of peer role models who influence the behavior of younger students by teaching them how to resist the influence attempts of cigarette manufacturers or negative peer group role models.

Attitude Change and Health Behaviors

Applications to health have been undertaken since the beginning of social psychological research on attitude formation and attitude change. From these many studies, a number of generalizations can be drawn:

1. Communications should be colorful and vivid rather than steeped in statistics and jargon. If possible, they should also use case histories (Taylor & Thompson, 1982). For example,

a vivid account of the health benefits of regular exercise, coupled with a case history of someone who took up bicycling after a heart attack, may be persuasive to someone at risk for heart disease.

2. The communicator should be expert, prestigious, trustworthy, likable, and similar to the audience (McGuire, 1964). For example, a health message will be more persuasive if it comes from a respected, credible physician rather than from the proponent of the latest health fad.
3. Strong arguments should be presented at the beginning and end of a message, not buried in the middle.
4. Messages should be short, clear, and direct.
5. Messages should state conclusions explicitly. For example, a communication extolling the virtues of a low-cholesterol diet should explicitly advise the reader to alter his or her diet to lower cholesterol.
6. Extreme messages produce more attitude change, but only up to a point. Very extreme messages are discounted. For example, a message that urges people to exercise for at least half an hour 3 days a week will be more effective than one that recommends several hours of exercise a day.
7. For illness detection behaviors (such as HIV testing or obtaining a mammogram), emphasizing the problems that may occur if it is not undertaken will be most effective (for example, Banks et al., 1995; Kalichman & Coley, 1996). For health promotion behaviors (such as sunscreen use), emphasizing the benefits to be gained may be more effective (Rothman & Salovey, 1997).
8. If the recipient of the message has a promotion (or approach) orientation, then messages phrased in terms of benefits are more successful (e.g., calcium will keep your bones

healthy). People who have a prevention (or avoidance) orientation will be more influenced by messages that stress the risks of not performing a health behavior (e.g., a low calcium intake will increase bone loss) (Mann, Sherman, & Updegraff, 2004).

9. If the audience is receptive to changing a health habit, then the communication should include only favorable points, but if the audience is not inclined to accept the message, the communication should discuss both sides of the issue. For example, messages to smokers ready to stop should emphasize the health risks of smoking. Smokers who have not yet decided to stop may be more persuaded by a communication that points out its risk while acknowledging and rebutting its pleasurable effects.

Attitudinal approaches to changing health habits often make use of **fear appeals.** This approach assumes that if people are fearful that a particular habit is hurting their health, they will change their behavior to reduce their fear. Common sense suggests that the relationship between fear and behavior change should be direct: The more fearful an individual is, the more likely he or she should be to change the relevant behavior. However, research has found that this relationship does not always hold (Leventhal, 1970). Persuasive messages that elicit too much fear may actually undermine health behavior change (Becker & Janz, 1987). Moreover, research suggests that fear alone may not be sufficient to change behavior. Sometimes fear can affect intentions to change health habits (for example, Sutton & Eiser, 1984), but it may not produce long-lasting changes in health habits unless it is coupled with recommendations for action or information about the efficacy of the health behavior (Self & Rogers, 1990).

Providing information does not ensure that people will perceive that information accurately, however. Sometimes when people receive negative information about risks to their health, they process that information defensively (Millar & Millar, 1996). Instead of making appropriate health behavior changes, the person may reinterpret the problem as less serious or

more common than he or she had previously believed (for example, Croyle, Sun, & Louie, 1993), particularly if the person intends to continue the behavior (Gerrard, Gibbons, Benthin, & Hessling, 1996). Smokers, for example, know that they are at a greater risk for lung cancer than are nonsmokers, but they see lung cancer as less likely or problematic and smoking as more common than do nonsmokers.

The Health Belief Model

The most influential attitude theory of why people practice health behaviors is the **health belief model** (Rosenstock, 1966). This model states that whether a person practices a particular health behavior can be understood by knowing two factors: whether the person perceives a personal health threat and whether the person believes that a particular health practice will be effective in reducing that threat.

The perception of a personal health threat is influenced by at least three factors: general health values, which include interest and concern about health; specific beliefs about personal vulnerability to a particular disorder; and beliefs about the consequences of the disorder, such as whether or not they are serious. Thus, for example, people may change their diet to include low-cholesterol foods if they value health, feel threatened by the possibility of heart disease, and perceive that the threat of heart disease is severe (Brewer et al., 2007).

Whether a person believes a health measure will reduce threat has two subcomponents: whether the individual thinks a health practice will be effective and whether the cost of undertaking that measure exceeds the benefits of the measure (Rosenstock, 1974). For example, the man who feels vulnerable to a heart attack and is considering changing his diet may believe that dietary change alone would not reduce the risk of a heart attack and that changing his diet would interfere with his enjoyment of life too much to justify taking the action. Thus, although

his belief in his personal vulnerability to heart disease may be great, if he lacks the belief that a change of diet would reduce his risk, he would probably not make any changes.

The health belief model explains people's practice of health habits quite well. It predicts preventive dental care (Ronis, 1992), breast self-examination (Champion, 1990), dieting for obesity (Uzark, Becker, Dielman, & Rocchini, 1987), and AIDS risk-related behaviors (Aspinwall, Kemeny, Taylor, Schneider, & Dudley, 1991) among many other behaviors. Typically, health beliefs are a modest determinant of intentions to take these health measures.

The health belief model also predicts some of the circumstances under which people's health behaviors will change. Interventions that draw on the health belief model have generally supported its predictions. Highlighting perceived vulnerability and simultaneously increasing the perception that a particular health behavior will reduce the threat are somewhat successful in changing smoking (Eiser, van der Plight, Raw, & Sutton, 1985), preventive dental behavior (Ronis, 1992), and osteoporosis prevention measures (Klohn & Rogers, 1991), for example. However, the health belief model focuses heavily on beliefs about risk, rather than emotional responses to perceived risk, which may better predict behavior (e.g., Lawton, Conner, & Parker, 2007; Peters, Slovic, Hibbard, & Tusler, 2006; Weinstein et al., 2007). In addition, the health belief model leaves out an important component of health behavior change: the perception that one will be able to engage in the health behavior.

Self-efficacy

That is, an important determinant of the practice of health behaviors is a sense of **self-efficacy:** the belief that one is able to control one's practice of a particular behavior (Bandura, 1991; Murphy, Stein, Schlenger, Maibach, & NIMH Multisite HIV Prevention Trial Group, 2001). For example, smokers who believe they will not be able to break their habit probably will not try to quit, however much they think that smoking is risky and that stopping smoking is

desirable. Self-efficacy affects health behaviors as varied as abstinence from smoking (Prochaska & DiClemente, 1984), weight control (Strecher, DeVellis, Becker, & Rosenstock, 1986), condom use (Wulfert & Wan, 1993), and dietary change (Schwarzer & Renner, 2000), among other outcomes. Typically, research finds a strong relationship between perceptions of self-efficacy and both initial health behavior change and long-term maintenance of change.

The Theory of Planned Behavior

Although health beliefs go some distance in clarifying when people will change their health habits, increasingly health psychologists are turning their attention to the analysis of action. A theory that links health attitudes directly to behavior is Ajzen's **theory of planned behavior** (Ajzen & Madden, 1986; Fishbein & Ajzen, 1975).

According to this theory, a health behavior is the direct result of a behavioral intention. Behavioral intentions are themselves made up of three components: attitudes toward the specific action, subjective norms regarding the action, and perceived behavioral control. Attitudes toward the action are based on beliefs about the likely outcomes of the action and evaluations of those outcomes. Subjective norms are what a person believes *others* think that person should do (normative beliefs) and the motivation to comply with those normative references. Perceived behavioral control occurs when a person feels able to perform the action contemplated and that the action undertaken will have the intended effect; this component of the model is very similar to self-efficacy. These factors combine to produce a behavioral intention and, ultimately, behavior change. To take a simple example, smokers who believe that smoking causes serious health outcomes, who believe that other people think they should stop smoking, who are motivated to comply with those normative beliefs, and who believe that they are capable of stopping smoking will be more likely to intend to stop smoking than individuals who do not hold these beliefs.

The theory of planned behavior is a useful addition to understanding health behavior change processes for two reasons. First, it provides a model that links beliefs directly to behavior. Second, it provides a fine-grained picture of people's intentions with respect to a particular health habit. It predicts a broad array of health behaviors, including condom use among students (Sutton, McVey, & Glanz, 1999), sunbathing and sunscreen use (Hillhouse, Stair, & Adler, 1996), use of oral contraceptives (Doll & Orth, 1993), and consumption of soft drinks among adolescents (Kassem & Lee, 2004), among many other health behaviors.

Limitations of Attitude Change Approaches

Despite the success of theories that link beliefs to the modification of health habits, attitudinal approaches are not very successful for explaining spontaneous behavior change, nor do they predict long-term behavior change very well. An additional complication is that communications designed to change people's attitudes about their health behaviors sometimes evoke defensive or irrational processes: People may perceive a health threat to be less relevant than it really is (Liberman & Chaiken, 1992), they may falsely see themselves as less vulnerable than others (Clarke, Lovegrove, Williams, & Macpherson, 2000), and they may see themselves as dissimilar to those who have succumbed to a particular health risk (Thornton, Gibbons, & Gerrard, 2002). Continued practice of a risky behavior may itself lead to changes in perception of a person's degree of risk, inducing a false sense of complacency (Halpern-Felsher et al., 2001).

Moreover, thinking about disease can produce a negative mood (Millar & Millar, 1995), which may, in turn, lead people to ignore or defensively interpret their risk. Although some research has found that inaccurate risk perception can be modified by information and educational interventions (Kreuter & Strecher, 1995), other reports suggest that unrealistic optimism is peculiarly invulnerable to feedback (Weinstein & Klein, 1995).

Because health habits are often deeply ingrained and difficult to modify, attitude change procedures may not go far enough in simply providing the informational base for altering health habits (Ogden, 2003). Attitude-change procedures may instill the motivation to change a health habit but not provide the preliminary steps or skills necessary to actually alter behavior and maintain behavior change (Bryan, Fisher, & Fisher, 2002). Consequently, health psychologists have also turned to therapeutic techniques that typically draw on the principles of cognitive behavior therapy (Antoni et al., 2001).

Finally, it is important to bear in mind that each health habit has a specific social, psychological, and cultural context that often needs to be addressed when an intervention is implemented. For example, interventions that draw on individualistic values and needs may be most successful for modifying the health behaviors of European Americans, whereas interventions that draw on social values may be more successful among Latinos (Fitzgibbon, Stolley, Avellone, Sugerman, & Chavez, 1996). Accordingly, successful interventions need to identify what these dimensions are and address those components of the health behavior as well as the aspects of the intervention directly addressed by the theoretical model.

As an example, consider the modification of behaviors related to HIV infection. Most interventions begin by educating a target population about risky activity, providing information about AIDS and modes of transmission, and drawing on one or more of the theories just described for designing persuasive communications. There may, however, be particular teachable moments when AIDS education is particularly valuable. For example, gay men who have lost a partner are more likely to engage in unprotected anal intercourse in the following months, and at the beginning of a new relationship, people are especially likely to practice risky behaviors. Consequently, interventions may be especially successful at these times. Cultural sensitivity is essential to modifying risky sexual behavior. For example, an intervention by

Jemmott, Jemmott, and Fong (1992) was designed to appeal especially to inner-city African American adolescents, using materials specifically developed to be interesting to them; the intervention was implemented by young African Americans. Another issue that arises when using social psychological theories to design interventions is whether there are cofactors or environmental factors that influence the behavior that need to be simultaneously addressed. An example is alcohol consumption during risky sexual activity. Alcohol is known to disinhibit sexual behavior, and so, effective interventions may need to simultaneously address the alcohol component as well (Morgenstern et al., 2007).

The overall message is that, whereas attitude change studies conducted in the laboratory often create pure conditions to test specific hypotheses derived from the theories, interventions conducted in the real world are often aimed at the multitude of factors that influence the health habit so that the intervention will actually work.

Adherence to Treatment

Adherence to complex treatment regimens is often required for the modification of health behaviors and the management of chronic conditions, and its likelihood depends critically on patient-practitioner communication. Changes in the structure of the healthcare delivery system have brought this issue increasingly to the fore, as patients express dissatisfaction with their often fragmented managed care. Because patients typically do not have the medical expertise to judge whether their care is technically competent, they often judge the quality of their care based on how much they like the practitioner, including how friendly, apparently caring, polite, and friendly he or she was (Bogart, 2001).

Accordingly, social psychologists have been heavily involved in interventions to attempt to eliminate the common complaints that patients report. These include inattentiveness, use of jargon, baby talk, depersonalization, and brusque, rushed visits. In addition, communication

patterns appear to be especially eroded when physicians encounter patients whom they would prefer not to treat. These may include the elderly and members of minority groups. Studies show that physicians give less information, are less supportive, and demonstrate less proficient clinical care with African American and Latino patients and patients of lower socioeconomic status than is true for more advantaged and white patients (Van Ryn & Fu, 2003). Satisfaction tends to be higher when patients are seen by practitioners of the same race or ethnicity (Laveist & Nuru-Jeter, 2002). Sexism, likewise, is a problem, in that medical intervention is sometimes regarded as less important for female than male patients (Martin & Lemos, 2002). Women may be stereotyped as seeking treatment for psychological distress, such as depression or anxiety. Communication interventions can help to reduce problems such as these.

Communication interventions are most successful if the recommendations can be learned easily, incorporated into medical routines easily, and implemented virtually automatically. For example, greeting patients, addressing them by name, telling them where they can hang up their clothes if an examination is warranted, explaining the purpose of a procedure before and while it is going on, saying goodbye, and using the patient's name are simple behaviors that may add mere seconds to a visit. The author's own physician also made short notes in his charts about things to converse about during visits and inquired faithfully about the author's dog long after the dog had died. Nonetheless, actions such as these are seen as signs of warmth and supportiveness by patients (DiMatteo, 2004).

Simple communication interventions can also improve adherence to treatment. Asking the patient to repeat what needs to be done, keeping recommendations as simple as possible, writing them down as well as communicating them orally, emphasizing the importance of adherence, acknowledging the patient's efforts to adhere, involving family members when possible, using short words and short sentences that include concrete, specific language, finding

out what the patient's worries are or what potential barriers to treatment might be also help to improve non-adherence (Taylor, 2009a).

Alerting practitioners to how effective they can be as agents of behavior change is important. Practitioners are highly credible sources for patients with knowledge of medical issues, and they are typically well-respected by patients. The practitioner is in a better position to effect behavior change and encourage adherence than many other people in the patient's life. By making messages simple and tailoring them to personal needs, the practitioner can help the patient decide to adhere and figure out how to implement recommendations in his or her life. The private face-to-face nature of the interaction between the health care practitioner and patient provides an effective setting for holding attention, repeating and clarifying instructions, extracting commitments for adherence from the patient, and assessing potential sources of resistance.

Drawing on the six bases of power originally articulated by French and Raven (1959) yields the insight that health practitioners, especially physicians, can make use of all these sources of power in their communications with patients (Raven, 1992). Physicians have legitimate power, namely the right to request that patients undertake particular actions. They have information power, in that physicians can control the persuasive power of a message. They have expertise, by virtue of special knowledge. For most patients, physicians also hold reward power, in that approval from one's physician for achieving positive outcomes is likely to be rewarding. Physicians have the potential for coercive power by promising unpleasant tests or hospitalization if the patient fails to follow the physician's recommendations. Finally, physicians have referent power because patients may want to foster a positive relationship with the physician and thus voluntarily adhere to the behaviors that are recommended (Raven, 1992).

The practitioner can also keep the patient under at least partial surveillance and monitor progress at subsequent visits.

At one time, the importance of communication processes during medical visits was not fully recognized. But with research, much of which was conducted by social psychologists, training institutions have become more receptive to the importance of training programs such as these. The payoffs for the often minimal amount of time invested in communication training can be very high. Good communication has been tied directly to patient satisfaction with care, a disinclination to sue in discretionary medical malpractice cases, and adherence to treatment. Social psychologists have been involved in many of the interventions that are now widely adopted in medical school curricula for training physicians in these simple, basic steps.

Health Psychology Today

At the present time, health psychology is moving in multiple directions, as both basic research and applications of the principles described here represent vibrant areas of research. One of the challenges facing health psychology is to identify the pathways whereby social psychological variables have robust effects on health and illness. For example, social support is, arguably, the most potent social psychological variable affecting health that has been identified to date, and yet we still know relatively little about what aspects of social support exert these effects and the pathways by which they do so. Similarly, such variables as optimism and neuroticism have been clearly linked to health outcomes, and yet the mechanisms by which these relations exist remain sketchy. This is a challenge for future work.

Related to this issue is how health psychologists integrate multiple levels of analysis to reach an understanding of these pathways. Increasingly, research is bringing together perspectives from genetics, neuroendocrine functioning, immune functioning, and biomedical markers of disease to elucidate these underlying mechanisms. Among other issues, this

integrative approach requires that social psychologists entering the field ask themselves hard questions: How much must we know about the functioning of biological systems, such as the expression of genes, the functioning of neuroendocrine systems, the immune system, and the like, to make meaningful contributions to this multidisciplinary field? Each person entering the field must make that decision.

Another significant issue in the field concerns the mechanics of how health psychologists can change the health behaviors of as many people most efficiently as possible in a cost effective manner. How can we bottle what is effective for changing behavior and put it into a short-term, inexpensive, easily implemented intervention with enduring effects? Sometimes the challenges facing the investigator attempting to change behavior requires abandoning a pure theoretical orientation in favor of what works. This can go against the basic research training and emphasis on theory that marks good social psychological training. It may also mean that is it not always possible to identify exactly which aspects of an intervention produce the desired effects. Research that moves back and forth between the laboratory and the field, however, has the potential to test basic theory in the laboratory and then package its products with other effective intervention techniques for implementation in the field.

The field of health psychology is a broad and diverse one and includes inputs from all branches of psychology. The characterization in this chapter has emphasized the contributions of social psychology. These include the dynamics of stress and the development of effective coping resources and ways of coping; the modification of health risks through interventions that draw on principles of social influence and attitude change; the understanding of the social and cultural environments within which health behaviors are enacted; and the development of interventions to improve communication between patients and practitioners, which has payoffs for satisfaction with care and adherence to complex treatment regimens.

Yet the role for social psychologists in health psychology is not inherently limited to these applications. Social psychologists have increasingly been involved in the teams that develop interventions and evaluate them, because we have expertise concerning the dynamics of social interaction that underlie virtually all interventions. Consequently, the role of social psychologists in health psychology is an ever expanding one that will bring important changes and insights in future decades, as we learn more about the determinants of good and poor health.

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Footnotes

[1] Morbidity refers to the number of cases of a disease that exist at a given point in time. Mortality refers to the number of deaths due to particular causes.

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