CHAPTER

9 Social Support: A Review

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Abstract

Social support, which is the perception or experience that one is cared for, esteemed, and part of a mutually supportive social network, has beneficial effects on mental and physical health. We review the psychobiological pathways whereby these effects may occur and detail the circumstances under which socially supportive efforts may misfire. Origins of social support include genetic factors and the early environment. We examine gender and cultural differences in how social support is experienced. Under some circumstances, providing social support confers the same benefits as receiving it. A myriad number of social support interventions, including those delivered via the internet, have been evaluated and have the potential to provide emotional and informational support to people who might otherwise lack social support.

Keywords: Social support, stress, emotional support, informational support, instrumental support, gender, culture, genes, early environment, interventions, support groups

Group living is perhaps the most significant adaptation of primate species, including human beings. Whereas other animals are armed with weapons, such as sharp teeth or claws, and defensive resources, such as thick skin and speed, primate species depend critically on group living for survival (Caporeal, 1997; Dunbar, 1996). This tendency to come together is especially great under threat. Even chimpanzees, known for their solitary behavior, may abandon this style in favor of group activity when an enhanced risk of predation exists (Boesch, 1991). In times of intense stress, humans are much the same. Following the September 11 terrorist attacks, some of the most common methods people reported using to cope with this threatening event involved turning to others, including family, friends, and even strangers (Galea et al., 2002). There are, of course, tangible benefits to social affiliation under threat. For example, following a disaster, such as a fire, a flood, or a bombing, the presence of many hands can locate survivors and get them to safety. But the presence of others has long been known to foster adjustment to threatening events in other ways, specifically by protecting against adverse changes in mental and physical health that may otherwise occur in response to stress. Social support is now so widely acknowledged as a critical resource for managing stressful occurrences that over 1,100 articles on the topic appear in the research and clinical literatures each year.

What Is Social Support?

Social support is defined as 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 come from a partner, relatives, friends, coworkers, social and community ties, and even a devoted pet (Allen, Blascovich, & Mendes, 2002). Taxonomies of social support have usually classified support into several specific forms. *Informational support* occurs when one individual helps another to understand a stressful event better and to ascertain what resources and coping strategies may be needed

to deal with it. Through such information or advice, a person under stress may determine exactly what potential costs or strains the stressful event may impose and decide how best to manage it. *Instrumental support* involves the provision of tangible assistance such as services, financial assistance, and other specific aid or goods. Examples include driving an injured friend to the emergency room or providing food to a bereaved family. *Emotional support* involves providing warmth and nurturance to another individual and reassuring a person that he or she is a valuable person for whom others care. But as the definition makes clear, social support can also involve simply the *perception* that such resources are available, should they be needed. For example, knowing that one is cared for and/or that one could request support from others and receive it is comforting in its own right. Thus, social support may involve specific transactions whereby one person explicitly receives benefits from another, or it may be experienced through the perception that such help and support is potentially available.

Social support is typically measured either in terms of the structure of socially supportive networks or the functions that network members may provide (e.g., Wills, 1998). Structural social support, often referred to as social integration, involves the number of social relationships in which an individual is involved and the structure of interconnections among those relationships. Social integration measures assess the number of relationships or social roles a person has, the frequency of contact with various network members, and the density and interconnectedness of relationships among the network members. Functional support is typically assessed in terms of the specific functions (informational, instrumental, and emotional) that a specific member may serve for a target individual and is often assessed in the context of coping with a particular stressor. Thus, an individual might be asked how much of different kinds of support each member of a supportive network provided during a stressful event.

An early debate in the social support literature centered on the circumstances under which social support may be beneficial. One hypothesis, known as the direct effects hypothesis, maintains that social support is generally beneficial to mental and physical health during nonstressful times as well as during stressful times. The other hypothesis, known as the buffering hypothesis, maintains that the health and mental health benefits of social support are chiefly evident during periods of high stress; when there is little stress, social support may have few physical or mental health benefits. According to this hypothesis, social support acts as a reserve and resource that blunts the effects of stress or enables an individual to deal with stress more effectively, but otherwise is less consequential for mental and physical health (Cohen & Wills, 1985). After decades of research, evidence for both types of effects have emerged. Measures of social integration typically show direct associations with mental and physical health, but not buffering effects (Thoits, 1995). In contrast, the perception that emotional support is available is associated both with direct benefits to physical and mental health and also with buffering effects (e.g., Wethington & Kessler, 1986).

Benefits of Social Support and Reasons for the Benefits

MENTAL AND PHYSICAL HEALTH BENEFITS

Research consistently demonstrates that social support reduces psychological distress such as depression or anxiety during times of stress (e.g., Fleming, Baum, Gisriel, & Gatchel, 1982; Lin, Ye, & Ensel, 1999; Sarason, Sarason, & Gurung, 1997). It has been found to promote psychological adjustment to chronically stressful conditions, such as coronary artery disease (Holahan, Moos, Holahan, & Brennan, 1997), diabetes, HIV (Turner-Cobb et al., 2002), cancer (Penninx et al., 1998; Stone, Mezzacappa, Donatone, & Gonder, 1999), rheumatoid arthritis (Goodenow, Reisine, & Grady, 1990), kidney disease (Dimond, 1979), childhood leukemia (Magni, Silvestro, Tamiello, Zanesco, & Carl, 1988), and stroke (Robertson & Suinn, 1968), among other disorders. Social support also protects against cognitive decline in older adults (Seeman, Lusignolo, Albert, & Berkman, 2001), heart disease among the recently widowed (Sorkin, Rook, & Lu, 2002), and psychological distress in response to traumatic events, such as 9/11 (Simeon, Greenberg, Nelson, Schmeider, & Hollander, 2005).

Social support also contributes to physical health and survival (e.g., Rutledge et al., 2004). In a classic study that documented this point, epidemiologists Lisa Berkman and Leonard Syme (1979) followed nearly 7,000 California residents over a 9-year period to identify factors that contributed to their longevity or early death. They found that people who lacked social and community ties were more likely to die of all causes during the follow-up period than were those who cultivated or maintained their social relationships. Having social contacts predicted an average 2.8 years increased longevity among women and 2.3 years among men, and these

differences persisted after controlling for socioeconomic status (SES), health status at the beginning of the study, and health habits (Berkman & Syme, 1979). Of particular significance is the fact that the positive impact of social ties on health is as powerful, and in some cases, more powerful a predictor of health and longevity than well-established risk factors for chronic disease and mortality, with effect sizes on par with smoking, blood pressure, lipids, obesity, and physical activity (House, Landis, & Umberson, 1988).

These benefits are realized in part by the fact that social support appears to help people to stave off illness altogether. For example, Cohen and associates (1997) intentionally infected healthy community volunteers with a cold or flu virus by swabbing the inside of their nasal passages with virus-soaked cotton swabs. They found that people experiencing a high level of stress were more likely to develop infections than were people under less stress, and the colds and flus they developed were more serious as well. However, those with more social ties were less likely to become ill following exposure to the virus, and if they did, they were able to recover more quickly than were those with fewer social ties (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997).

On the whole, though, evidence for the impact of social support on the likelihood of becoming ill is not as consistently positive as evidence for its impact on course of illness or recovery (Seeman, 1996; Taylor & Seeman, 2000). It may be that social contacts both contribute to illness likelihood, as through contagion or the creation of stress (e.g., Hamrick, Cohen, & Rodriguez, 2002), but also promote health via social support, leading, on balance, to the only moderately positive net effect on illness likelihood.

Social support has been tied to a variety of specific health benefits among individuals sustaining health risks. These include fewer complications during pregnancy and childbirth (Collins, Dunkel-Schetter, Lobel, & Scrimshaw, 1993), less susceptibility to herpes attacks among infected individuals (VanderPlate, Aral, & Magder, 1988), lower rates of myocardial infarction among individuals with diagnosed disease, a reduced likelihood of mortality from myocardial infarction (Kulik & Mahler, 1993; Wiklund et al., 1988), faster recovery from coronary artery disease surgery (King, Reis, Porter, & Norsen, 1993; Kulik & Mahler, 1993), better diabetes control (Marteau, Bloch, & Baum, 1987), better compliance and longer survival in patients with end-stage renal disease (Cohen et al., 2007), and less pain among arthritis patients (Brown, Sheffield, Leary, & Robinson, 2003).

The impact of social support on mortality is also clearly established, as the seminal study by Berkman and Syme (1979) suggests. In prospective studies controlling for baseline health status, people with a higher quantity and quality of social relationships have consistently been shown to be at lower risk of early death (Herbst-Damm & Kulik, 2005; Seeman, 1996), and in studies of both humans and animals, social isolation has been found to be a major risk factor for early mortality (House et al., 1988).

PATHWAYS LINKING SOCIAL SUPPORT TO HEALTH

Considerable effort has gone into exploring the pathways whereby social support is beneficial to health. Early research examined the possibility that social support may be associated with good health habits which, in turn, beneficially affect health. For example, family living has been tied to a broad array of good health habits, including a lower likelihood of drug or alcohol abuse and smoking, and an enhanced likelihood of a balanced diet and good sleep habits (e.g., Umberson, 1987). Social isolation has been tied to unhealthy responses to stress, such as smoking and alcohol abuse, which can adversely affect health (Broman, 1993). However, although social support may be helpful to people initially in developing or changing health habits, such as stopping smoking, it may have less consistent effects on maintenance (Carlson, Goodey, Bennett, Taenzer, & Koopmans, 2002). If the social support network itself is engaged in a behavior change program, social support may beneficially affect ongoing maintenance. In one study (Fraser & Spink, 2002), for example, women for whom exercise had been prescribed for medical problems were less likely to drop out if they experienced social support in the group. Similarly, when families are engaged in behavior change programs (such as dietary change following diagnosis of cardiovascular disease), such involvement may promote better adherence to an otherwise taxing set of changes (Wilson & Ampey-Thornhill, 2001). Social support may also increase commitment to medical regimens because it enhances feelings of self-efficacy (DiMatteo, 2004; Resnick, Orwig, Magaziner, & Wynne, 2002) or because it affects responsiveness to social influence efforts by others (Cohen & Lemay, 2007). But some social networks may also promote unhealthy behaviors, such as smoking, drug abuse, and drinking (Wills & Vaughan, 1989). On the whole, the impact of social

support on health appears to exist over and above any influence it exerts on health habits.

Accordingly, researchers have focused heavily on potential physiological, neuroendocrine, and immunologic pathways by which social support may achieve its health benefits. What are these pathways? During times of stress, the body releases the catecholamines epinephrine and norepinephrine with concomitant sympathetic nervous system (SNA) arousal and may also engage the hypothalamic-pituitary-adrenocortical (HPA) axis, involving the release of corticosteroids including cortisol. These responses have short-term protective effects under stressful circumstances, because they mobilize the body to meet the demands of pressing situations. However, with chronic or recurrent activation, they can be associated with deleterious long-term effects, with implications for health (e.g., Seeman & McEwen, 1996; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). For example, excessive or repeated discharge of epinephrine or norepinephrine can lead to the suppression of cellular immune function, produce hemodynamic changes such as increases in blood pressure and heart rate, provoke abnormal heart rhythms such as ventricular arrhythmias, and produce neurochemical imbalances that may relate to psychiatric disorders (McEwen & Stellar, 1993). Intense, rapid, and/or long-lasting sympathetic responses to repeated stress or challenge have been implicated in the development of hypertension and coronary artery disease.

Recently, evidence for these pathways has been found at the neural level (Eisenberger, Taylor, Gable, Hilmert, & Lieberman, 2007). In a study in which participants kept daily social support diaries, participated in a functional magnetic resonance imaging (fMRI) task assessing neurocognitive reactivity to a social stressor, and participated in laboratory stress tasks during which neuroendocrine responses were assessed, those who interacted regularly with supportive individuals across a 10-day period showed diminished cortisol reactivity to a social stressor. Moreover, greater social support and diminished cortisol responses were associated with diminished activity in the dorsal anterior cingulate cortex (dACC) and Brodmann area 8, brain regions whose activity has previously been tied to social distress. Differences in this neurocognitive reactivity mediated the relationship between social support and low cortisol reactivity. Thus, this study helps to identify the pathways whereby social support affects neural regulation of neuroendocrine processes in response to stress, and this may contribute to health outcomes.

Social support may also protect against immune-related disorders and promote healthy responses to influenza vaccine (Pressman et al., 2005). Stress may increase the risk for adverse health outcomes by suppressing the immune system in ways that leave a person vulnerable to opportunistic diseases and infections. Corticosteroids have immunosuppressive effects, and stress-related increases in cortisol have been tied to decreased lymphocyte responsivity to mitogenic stimulation and to decreased lymphocyte cytotoxicity. Such immunosuppressive changes may be associated with increased susceptibility to infectious disorders and to destruction of neurons in the hippocampus as well (McEwen & Sapolsky, 1995).

An immunosuppression model does not explain how stress might influence diseases whose central feature is excessive inflammation, however; such diseases include allergic, autoimmune, rheumatologic, and cardiovascular disorders, among other disorders that are known to be exacerbated by stress. Miller, Cohen, and Ritchey (2002) hypothesized that chronic stress may diminish the immune system's sensitivity to glucocorticoid hormones that normally terminate the inflammatory cascade that occurs during stress. In support of their hypothesis, they found a clear buffering effect of social support on this process, such that among healthy individuals, glucocorticoid sensitivity bore no relation to social support; however, among parents of children with cancer (a population under extreme stress), those who reported receiving a high level of tangible support from others had higher glucocorticoid sensitivity. Relatedly, social integration has been tied to lower levels of C-reactive protein, a marker of inflammation (Loucks, Berkman, Gruenewald, & Seeman, 2006).

Extensive evidence suggests that all these systems—the HPA axis, the immune system, and the SNA—influence each other and thereby affect each other's functioning. For example, links between HPA axis activity and SNA activity suggest that chronic activation of the HPA axis could potentiate overactivation of sympathetic functioning (Chrousos & Gold, 1992). Proinflammatory cytokines, which are involved in the inflammatory processes just noted, can activate the HPA axis and may contribute not only to the deleterious effects that chronic activation of this system may cause, but also, potentially to depressive symptoms, which have previously been tied to HPA axis activation (Maier & Watkins, 1998; Capuron, Ravaud, & Dantzer, 2000). To the extent, then, that social support can keep SNA or HPA axis responses to stress low, it may have a beneficial

impact on other systems as well (Seeman & McEwen, 1996; Uchino et al., 1996). In turn, these benefits may affect health in a positive direction.

A variety of empirical studies has yielded evidence consistent with these hypotheses. For example, a considerable experimental literature demonstrates that the presence of a supportive person when one is going through a stressful task can reduce cardiovascular and HPA axis responses to stress; these benefits can be experienced whether the supportive person is a partner, a friend, or a stranger (e.g., Christenfeld et al., 1997; Gerin, Milner, Chawla, & Pickering, 1995; Gerin, Pieper, Levy, & Pickering, 1992; Kamarck, Manuck, & Jennings, 1990; Kors, Linden, & Gerin, 1997; Lepore, Allen, & Evans, 1993; Sheffield & Carroll, 1994; see Lepore, 1998 for a review).

Not all research shows beneficial effects of social support in challenging circumstances, however. Sometimes the presence of a friend or stranger actually increases sympathetic reactivity among those undergoing stress (e.g., Allen, Blascovich, Tomaka, & Kelsey, 1991; Mullen, Bryant, & Driskell, 1997). For example, Allen et al. (1991) found that relative to a control condition in which they remained alone, women who completed a stressful task in the presence of a female friend had higher physiological reactivity and poorer performance (see also Kirschbaum, Klauer, Filipp, & Hellhammer, 1995; Smith, Gallo, Goble, Ngu, & Stark, 1998). Whereas the presence of a partner seems to reduce stress-related physiological and neuroendocrine reactivity among men, the presence of a male partner more reliably enhances reactivity among women (Kiecolt-Glaser & Newton, 2001). The presence of a friend or partner may increase evaluation apprehension over whether important others' perceptions of the self may decline, and so this apprehension may eliminate any effect of support (Lepore, 1998).

Other biological processes may underlie the benefits of social support as well. A growing literature suggests a potential role for oxytocin in the neuroendocrine and physiological benefits of social support. In response to stress, animals and humans experience a cascade of hormonal responses that begins, at least in some stressors, with the rapid release of oxytocin. Consistent evidence suggests that (1) oxytocin is associated with affiliative activities in response to stress, (2) oxytocin is released in response to stress, and (3) oxytocin is associated with reduced SNS and HPA axis responses to stress (see Taylor, Dickerson, & Klein, 2002).

Research from both animal (e.g., Grippo et al., 2007) and human (e.g., Taylor, Gonzaga et al., 2006) studies has found that, in response to the social stressor of social isolation, oxytocin levels rise; one possible explanation for this effect is that oxytocin acts as a biological signal to the organism to seek social company. Indeed, the relation of oxytocin to affiliative activity is very strong. Exogenous administration of oxytocin reliably leads to increases in a broad array of prosocial activities, including seeking proximity, grooming, and mothering, and has been tied to empathy and trust in humans. Both animal (e.g., Witt, Carter, & Walton, 1990; McCarthy, 1995) and human (e.g., Grewen, Girdler, Amico, & Light, 2005) studies have found that oxytocin is consistently associated with signs of relaxation, including an increase in social contact and in grooming in animals (e.g., Carter, DeVries, & Getz, 1995), and relaxation and calm in humans (e.g., Uvnas-Moberg, 1996), and lower blood pressure and heart rate (Light, Grewen, & Amico, 2005). Oxytocin appears to inhibit the secretion of adrenocorticotropin (ACTH) hormone and cortisol in humans as well (Chiodera & Legros, 1981; Legros, Chiodera, & Demy-Ponsart, 1982).

The potential roles of oxytocin, both in the down-regulation of SNS and HPA axis responses to stress and in the tendency to turn to others, at present, are hypotheses with a great deal of animal evidence to support them, but less evidence from human studies. Consequently, this issue represents a direction for research, rather than an established biological pathway by which social support may exert protective effects on health. Moreover, there may be roles for other hormones both in promoting social support initially and in regulating its biological effects, which include vasopressin, norepinephrine, serotonin, prolactin, and endogenous opioid peptides (Nelson & Panksepp, 1998; Taylor et al., 2002).

WHY IS SOCIAL SUPPORT BENEFICIAL?

Much early research on social support took for granted that its impact on mental and physical health came largely from the specific benefits furnished by social support transactions. That is, when one person helps another, that other is benefited tangibly or emotionally in ways that can contribute to the well-documented beneficial outcomes described. A variety of observations, however, have led researchers to rethink whether all the benefits, or indeed, the primary benefits of social support come from its actual utilization.

The fact that structural measures of social support are associated with mental and physical health benefits is implicit support for questioning this account. If merely knowing the number of social ties an individual has leads to insights about that individual's health, then it would appear that the activation of those ties may not be essential for benefits to be experienced. Research suggests that the mere perception of social support, whether or not it is actually utilized, can be stress-reducing with concomitant benefits for well-being. For example, Broadwell and Light (1999) brought married men and women into the laboratory and had them fill out a questionnaire about how much support they felt they had at home (or a questionnaire assessing matters unrelated to support). Each person was then put through several stressful tasks such as computing difficult arithmetic problems in his or her head. The men who reported a lot of support from their families had lower blood pressure responses to the stressful tasks than did those who had less social support, suggesting that their families were providing support to them even though they were not physically present; the effect was not significant for women. In fact, beliefs about the availability of emotional support actually appear to exert stronger effects on mental health than the actual receipt of social support does (e.g., Wethington & Kessler, 1986; Dunkel-Schetter & Bennet, 1990; see Thoits, 1995 for discussion).

This point suggests that the receipt of social support may have costs. Consistent with this idea, Bolger, Zuckerman, and Kessler (2000) documented that actually making use of one's social support network can be associated with enhanced rather than reduced stress. In their studies, couples completed daily diaries regarding the stressors they experienced, how distressed they were in response to them, and whether they had provided or received support from their partner. Supportive acts that were reported by the support recipient did not promote adjustment to stress, but rather, were associated with poorer adjustment, suggesting that when explicit support efforts are recognized, there can be emotional costs to the recipient. However, when supportive acts were reported by the support provider, but were unrecognized by the recipient, stress-protective effects were found (Bolger & Amarel, 2007). The results suggest that the most effective support is "invisible" to the recipient; that is, it occurs without his or her awareness. Thus, it may be that one set of benefits that social support confers is the availability of a supportive network that may act in a supportive manner without one's realization, thereby reducing distress in response to threatening events. Indeed, merely thinking about one's supportive ties can reduce stress (Smith, Ruiz, & Uchino, 2004).

An important implication of results such as these is that, at least under some circumstances, people can carry their social support networks around in their heads to buffer them against stress without ever having to recruit their networks in active ways that may produce the costs just noted. Findings like these suggest that it is important to distinguish exactly when supportive efforts from others may be beneficial for mental and physical health and when they may not show these benefits (Bolger & Amarel, 2007).

WHEN IS SOCIAL SUPPORT BENEFICIAL?

Whether social contacts are experienced as supportive may depend on several factors. These include how large or dense one's social support networks are, whether the support provided is appropriate for meeting the stressor, and whether the right kind of support comes from the right person.

Considerable research has explored the characteristics of socially supportive networks. As noted, people who belong to more formal and informal organizations in their communities, such as church groups, the PTA, clubs, and the like, enjoy the health and mental health benefits of social support. This may be because such people are more socially skilled to begin with and thus seek out contacts from others, or it may be a direct consequence of participation in supportive networks. Social networks may also be important for accessing specific types of assistance during times of stress (such as social services) (Lin & Westcott, 1991). However, the beneficial effects of social support are not cumulative in a linear fashion. It is clear that having a confidant (such as a spouse or a partner) may be the most effective social support (Collins & Feeney, 2000; Cohen & Wills, 1985), especially for men (e.g., Broadwell & Light, 1999; Wickrama, Conger, & Lorenz, 1995). Accordingly, married people report higher perceived support than unmarried people do (Thoits, 1995). With respect to friends, research documents the benefits of at least one close friend, but having a dozen or more close friends may be little more beneficial for health and mental health than having a few close friends (Langner & Michael, 1960). Indeed, one of the risks of social support networks is that overly intrusive social support may actually exacerbate stress (Shumaker & Hill, 1991).

People who belong to dense social networks of friends or family who are highly interactive may find themselves overwhelmed by the advice and interference that is available to them in times of stress. As comedian George Burns noted, "happiness is having a large, loving, caring, close-knit family in another city."

Sometimes support providers give poor advice, fail at providing tangible assistance, or provide inappropriate or too little emotional support, thereby reducing or eliminating the effectiveness of the effort (Bolger, Foster, Vinokur, & Ng, 1996; Burg & Seeman, 1994). Social support efforts, too, may be well-intentioned, but perceived as controlling or directive by the recipient. For example, when a spouse is pulled into the management of a chronic disease, such as coronary artery disease, the "support" of encouraging exercise and changing a partner's diet may be perceived as interference by the patient (Franks et al., 2006). Although such well-intentioned support may achieve some benefits in modifying behaviors in a healthy direction, the potential to produce interpersonal conflict and psychological distress is clearly present as well (e.g., Fisher, La Greca, Greco, Arfken, & Schneiderman, 1997; Lewis & Rook, 1999; Wortman & Lehman, 1985). Socially supportive efforts may misfire for other reasons. When significant others' responses to a person's expression of symptoms or distress is contingent on that expression, such "support" may unwittingly reinforce symptom experiences and actually enhance emotional distress (Itkowitz, Kerns, & Otis, 2003).

Effective social support may depend on an appropriate balance between the needs of the recipient and what that recipient gets from those in the social network (Cohen & McKay, 1984; Cohen & Wills, 1985). This "matching hypothesis" suggests that, to be supportive, the actions of the provider must meet the specific needs of the recipient (Thoits, 1995). Thus, for example, if a person needs emotional support but receives advice instead, the misfired effort at support may actually increase psychological distress (Horowitz et al., 2001; Thoits, 1986). Research generally supports this hypothesis. Different kinds of support, for example, may be valued from different members of a social support network. Emotional support may be most helpful from intimate others and actually resented when casual friends attempt to provide it, whereas information and advice may be especially valuable from experts but regarded as inappropriate from well-intentioned friends or family with questionable expertise (e.g., Benson, Gross, Messer, Kellum, & Passmore, 1991; Dakof & Taylor, 1990). Consistent with this perspective, Helgeson and Cohen (1996) reviewed research on the impact of social support on adjustment to cancer. They found that emotional support was most desired by patients and appeared to have the greatest beneficial influence on adjustment. However, peer support group interventions whose goal was providing emotional support did not, for the most part, have benefits; rather, educational groups that provided information were perceived more positively. Although there are several possible interpretations of these findings, it may be that emotional needs were best met by those close to cancer patients, rather than by the relative strangers in the peer group, and that educational interventions in peer groups better met the cancer patients' specific informational needs.

Other threats to obtaining social support may come from the support recipient. People who are under extreme stress often express their distress to others and over time, can drive their social support networks away (Matt & Dean, 1993; McLeod, Kessler, & Landis, 1992). For example, depressed, disabled, or ill people can inadvertently repel their families and friends by persistently expressing their negative emotions (Alferi, Carver, Antoni, Weiss, & Duran, 2001; Coyne et al., 1987; Fyrand, Moum, Finset, & Glennas, 2002). In a longitudinal investigation of 405 elderly individuals, Gurung, Taylor, and Seeman (2003), found that men and women who were depressed or who had cognitive dysfunction reported more problems with social relationships at follow-up several years later (see also Honn & Bornstein, 2002; Alferi et al., 2001). They concluded that those most in need for social support were potentially less likely to receive it and to instead experience gaps in their social support.

The positive impact of social support on adjustment to stressful events may be attenuated in especially high-stress environments. For example, Ceballo and McLoyd (2002) found that the usually positive impact of social support on parenting behavior was attenuated in high-stress neighborhoods. Gurung, Taylor, Kemeny, and Myers (2004) found that, although high levels of social support were associated with lower levels of depression in a sample of low-income HIV-seropositive women, social support resources were not sufficient to moderate the relation between chronic burden and high levels of depression. Thus, like most resources, the effectiveness of social support in reducing distress due to stressful circumstances may have its limits at especially high levels of stress. Related to these observations is the

fact that the perception of social support as available is positively correlated with SES (Taylor & Seeman, 2000; Thoits, 1984).

A *New Yorker* cartoon shows one woman enthusiastically telling another woman that what she likes best about their friendship is that they never have to see each other or talk. Indeed, many relationships may be better for the having of them than for the using of them. Social relationships are fraught with the potential for discord as well as support, and so relationships are a potential double-edged sword. In a study of 120 widowed women, Rook (1984) found that negative social interactions were consistently and more strongly related (negatively) to well-being than were positive social interactions. Having one's privacy invaded by family and friends, having promises of help not come through, and being involved with people who provoked conflict or anger were among the events that worsened adjustment in this vulnerable sample. Similarly, Schuster, Kessler, and Aseltine (1990) found that negative interactions with a spouse or close friends augmented depression more than positive, supportive interactions reduced it. Research examining the neuroendocrine correlates of marital relationships likewise reveal that conflict can lead to elevated cortisol levels (Heffner et al., 2006), to delayed wound healing, and to a lower cytokine response at wound sites (Kiecolt-Glaser et al., 2005). Negative social interactions also contribute to negative self-rated health and to more adverse health conditions as well (Newsom, Mahan, Rook, & Krause, 2008). These findings not only underscore the double-edged nature of social relationships, but also imply that avoiding social relationships or situations that actually tax well-being may be helpful for managing stress.

Origins of Social Support

WHO GETS SOCIAL SUPPORT?

The fact that social relationships can be either supportive or unhelpful, and the fact that support recipients substantially affect which outcome occurs raises an intriguing issue. Is social support largely "outside" in the social environment or "inside" the person, in the form of abilities to extract support from the environment or construe support as available? Although social support no doubt involves aspects of both, attention to the qualities of the support recipient has yielded some important findings.

Research has suggested that there may be heritable aspects of social support. Specifically, research using twin-study methodology has uncovered a moderately high degree of heritability, either in the ability to construe social support as available or in the ability to experience one's network of friends and relatives as supportive (Kessler, Kendler, Heath, Neale, & Eaves, 1992). Similarly, heritability estimates suggest that genetic factors may account for about 50% of the variance in loneliness (Boomsma, Willemsen, Dolan, Hawkley, & Cacioppo, 2005). Although there are a number of potential interpretations of these findings, at the very least, they suggest that genes may play a role in some of the benefits of social support.

Some of these heritable factors may involve social competence. Some people are more effective than others in extracting the social support that they need, suggesting that social support involves a considerable degree of skill. People who have difficulty with social relationships, those who are chronically shy (Naliboff et al., 2004) or who anticipate rejection from others (Cole, Kemeny, Fahey, Zack, & Naliboff, 2003), are at risk for isolating themselves socially, with concomitant risks for health. Being a socially competent individual appears to be especially important for getting emotional support, but it may not predict as strongly the ability to get tangible assistance or information (Dunkel-Schetter, Folkman, & Lazarus, 1987).

Researchers are beginning to identify some of the specific genes that may be involved in the development (or not) of social skills. This work is in its infancy, and so some caution regarding these points is warranted. The μ-opioid receptor gene (*OPRM1*) appears to be implicated in the experience of social support. Specifically, people with the G allele of the polymorphism (A118G) appear to be more sensitive to potential rejection and also experience greater increases in salivary cortisol during laboratory stress tasks (Way, Taylor, & Eisenberger, 2009). Carriers of the G allele, relative to individuals with two copies of the A allele, also exhibit greater activity in the dACC during a social exclusion fMRI task. Thus, across multiple measures of social sensitivity, the G allele is associated with the potential for greater social distress. Recent research with monkeys shows similar findings (Barr et al., 2008; Miller et al., 2004).

Similarly, within the gene coding for monoamine oxidase (MAOA), the low expression variants of MAOA-uVNTR are tied to activation in the dACC in response to a social exclusion fMRI task; that activation is correlated with self-reported distress in response to social exclusion (Eisenberger, Way, Taylor, Welch, & Lieberman, 2007). Thus, it appears that the MAOA gene also influences distress experienced in response to social exclusion or rejection.

Other genes that contribute to social support (or its absence) are also likely to be uncovered. For example, genes that help to regulate the dopamine system may also be involved in the experiences of social support or social rejection (Way & Taylor, 2011). In addition, carriers of the A allele of the oxytocin receptor gene are less likely to show sensitive parenting (Bakermans-Kranenburg & van IJzendoorn, 2008), thereby pointing in a preliminary way to a gene that may be implicated in maternal nurturance. A polymorphism within the vasopressin 1A receptor (AVPR1A) has been tied to empathy and altruistic behavior, and may thereby contribute to social support processes (Bachner-Melman et al., 2005; Knafo et al., 2008). (For a review of genetic factors in social distress/social support, see Way & Taylor, 2011).

A DEVELOPMENTAL APPROACH TO SOCIAL SUPPORT

The fact that social support may have heritable aspects and that it may depend, in part, on social skills, suggests that focusing on its early familial antecedents may also be enlightening regarding why this vital resource seems to come so easily to some people and more rarely to others. The thesis to be offered here is that (a) the beneficial effects of social support on physical and mental health begin with supportive familial contact; (b) these contacts, in turn, lay the groundwork for the development of social competencies and corresponding abilities to enlist and provide social support and/or construe social support as available; and (c) these skills are transferred intergenerationally, through both genomic and nongenomic pathways.

Evidence that socially supportive contacts in early life have beneficial effects on responses to stress, mental health, and health is manifold and may be readily seen in both human and animal studies. In some of the earliest work on this topic, Harlow and Harlow (1962) found that monkeys who were raised with an artificial terrycloth mother and who were isolated from other monkeys during the first 6 months of life showed disruptions in their adult social contacts. They were less likely to engage in normal social behavior, such as grooming, their sexual responses were inappropriate, mothering among the females was deficient, and they often showed either highly fearful or abnormally aggressive behavior toward their peers. Not surprisingly, these social behaviors led to peer rejection. In sum, a broad array of social skills were compromised by the absence of early nurturant contact with the mother.

Building on work like this, Meaney and colleagues (Francis, Diorio, Liu, & Meaney, 1999; Liu et al., 1997) explicitly linked early nurturant maternal contact to the development of stress responses in offspring and showed that these contacts affect emotional and neuroendocrine responses to stress across the lifespan. In their paradigm, infant rats are removed from the nest, handled by a human experimenter and then returned to the nest. The response of the mother to this separation and reunification is intense licking and grooming and arched-back nursing, which provides the pup with nurturant and soothing immediate stimulation. On the short term, this contact reduces SNS and HPA axis responses to stress in the pups (and in the mother as well). Over the long term, this maternal behavior results in a better regulated HPA axis response to stress and novelty, and better regulation of somatic growth and neural development, especially hippocampal synaptic development in the pup. These rat pups also showed more open field exploration, which suggests lower levels of fear. This compelling animal model suggests that nurturant stimulation by the mother early in life modulates the responses of offspring to stress in ways that have permanent effects on the offspring's HPA axis responses to stress, on behavior suggestive of anxiety/fearfulness, and on cognitive function (see also Suomi, 1999).

Warm, nurturant, and supportive contact with a caregiver affects physiological and neuroendocrine stress responses in human infants and children, just as in these animal studies. Early research on orphans reported high levels of emotional disturbance, especially depression, in infants who failed to receive nurturant stimulating contact from a caregiver (Spitz & Wolff, 1946). More recent findings from Eastern European abandoned infants confirm that, without the affectionate attentions of caregivers, infants may fail to thrive, and many die (Carlson & Earls, 1997).

Not surprisingly, attachment processes are implicated in these relations. Gunnar and her associates, studying 15-month-old children receiving well-baby examinations, found that securely attached infants were less likely to show elevated cortisol responses to normal stressors, such as inoculations, than were less securely attached infants (Gunnar, Brodersen, Krueger, & Rigatuso, 1996; see also Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). The protective effects of secure attachment were especially evident for socially fearful or inhibited children (see also Levine & Wiener, 1988; Hart, Gunnar, & Cicchetti, 1996; see Collins & Feeney,

2000, for a discussion of attachment in adult supportive relationships).

Research also consistently suggests that families characterized by unsupportive relationships have damaging outcomes for the mental, physical, and social health of their offspring, not only on the short term, but across the lifespan. Overt family conflict, manifested in recurrent episodes of anger and aggression, deficient nurturing, and family relationships that are cold, unsupportive, and/or neglectful have been associated with a broad array of adverse mental and physical health outcomes long into adulthood (Repetti, Taylor, & Saxbe, 2007; Repetti, Taylor, & Seeman, 2002). The chronic stress of unsupportive families produces repeated or chronic SNS activation in children, which, in turn, may lead to wear and tear on the cardiovascular system. Over time, such alterations may lead to pathogenic changes in sympathetic or parasympathetic functioning or both. Such changes may contribute to disorders such as essential hypertension (e.g., Ewart, 1991) and coronary heart disease (e.g., Woodall & Matthews, 1989).

As appears to be true in the animal studies previously described, early nurturant and supportive contacts appear to be important for human offspring's emotional responses to stress as well, especially those involving anxiety or fear. Infants begin life with emergent abilities to monitor the environment, especially for potential threats. The amygdala is activated any time there is something new or unexpected in the environment, especially if it involves suggestions of danger. Early in life, the amygdala sends off many messages of alarm. Any loud noise, for example, will alarm an infant, and a few months later, strangers typically provoke distress. Through the comforting attentions of parents, infants begin to learn about and adjust to the social world. Over time, they learn that strangers are not necessarily threatening and that loud noises are not inevitably associated with danger, among other moderations of automatic responses to threat. As the prefrontal cortex develops, children learn additional ways to moderate the signals that they get from the amygdala, storing information about both the threatening and the comforting aspects of the social world.

The development of this system is critically affected by early nurturant contact. Infants form comforting bonds with others and, in turn, give rise to the emotion regulation skills and social skills that ultimately enable children to manage potentially threatening events autonomously, skills that become vital to managing stress across the lifespan (Taylor, 2002). That is, a broad array of evidence demonstrates that children from supportive families are more likely than those from unsupportive families to develop effective emotion regulation skills and social competencies (Repetti et al., 2002), as judged, for example, by teachers and peers. Similarly, adults whose interpersonal styles are marked by hostility and cynicism, a style that has been tied to an unsupportive or conflict-ridden early family environment, are less likely to report having social support (e.g., Smith, 1992) and/or support may be a less effective buffer against stress (e.g. Lepore, 1995).

Epigenetic factors appear to be involved in these pathways. That is, maternal nurturance can induce long-lasting changes in the function of genes, which is an additional mechanism by which experiences of early social support can induce long-term behavioral alterations in emotional and social functioning.

Meaney and colleagues have shown that rat pups exposed to highly nurturant mothering show less emotionality to novel circumstances and more normative social behavior, including mothering in adulthood, compared to recipients of normal mothering (Francis et al., 1999; Weaver et al., 2004). Studies with monkeys have shown similar effects. For example, Suomi (1987) reports that highly reactive monkeys cross-fostered to nurturant mothers develop good socioemotional skills and achieve high status in the dominance hierarchy, whereas monkeys with reactive temperaments who are peer-raised develop poor socioemotional skills and end up at the bottom of the dominance hierarchy.

Such long-term effects of maternal care appear to be a result of epigenetic structural alterations (methylation) to the glucocorticoid receptor gene that occur in the first week after birth and affect its expression throughout the lifespan (Meaney & Szyf, 2005). This process is affected by each of the neurochemical systems discussed in this chapter, and thus polymorphisms in these systems that affect signaling are likely to have downstream effects upon this process. Mothers showing high levels of nurturant behavior exhibit greater increases in oxytocin receptors during pregnancy, which is thought to trigger maternal responsivity (Meaney, 2001), and they have higher levels of dopamine release when caring for their pups (Champagne et al., 2004). This more nurturant mothering triggers greater increases in serotonin turnover in the pup, which initiates the cascade leading to the altered glucocorticoid receptor expression that affects adulthood reactivity to stress (Meaney & Szyf, 2005).

Related evidence has been uncovered with humans. For example, the harshness or nurturance of the early environment is implicated in the expression of the serotonin transporter gene (*5-HTTLPR*). People with two copies of the *5-HTTLPR* short allele (short/short) who have experienced childhood maltreatment are more likely to be diagnosed with major depressive disorder than are individuals with one or two copies of the long allele who have experienced similar environments (Caspi et al., 2003; Kaufman et al., 2004). A study from our laboratory (Taylor et al., 2006) suggests that the short allele may not only function as a risk allele for depression in the face of an adverse environment, but as an allele reflecting general sensitivity to the environment, providing protection from symptoms of depression when the environment is nurturant. Using a nonclinical sample of 118 adult men and women, we assessed nurturance of the early family environment, depressive symptomatology, and *5-HTTLPR* genotype. As expected, a stressful early family environment by itself was significantly related to depressive symptomatology. However, a significant gene-by-environment interaction between *5-HTTLPR* and the nurturance of the early family environment qualified the risk for depression. Specifically, individuals with two copies of the short allele had greater depressive symptomatology if they had experienced early familial adversity compared with participants with the short/long or long/long genotypes, but significantly less depressive symptomatology if they reported a supportive early environment. Notably, the adverse early family environments studied were ones in which the degree of social pain was fairly mild, consisting of some conflict, moderate household chaos, and/or cold, unaffectionate, and distant behaviors, rather than explicit maltreatment in the form of physical or sexual abuse.

Of interest, this differential sensitivity to the environment does not appear to be limited to childhood, but is present in adulthood as well. Thus, people with the short/short genotype who reported being in a currently highly stressful environment had higher levels of depressive symptomatology, relative to those with short/long or long/long variants, whereas those who reported currently being in a low-stress environment had significantly lower levels of depressive symptomatology (Taylor, Way et al., 2006). Reports of the early and current environment were only modestly correlated with each other, and so these results are fairly independent of each other. Thus, with respect to depressive symptoms, the short/short genotype of the serotonin transporter gene appears to be risky in harsh environments but protective in nurturant environments. Consistent with this latter point, short/short individuals have been found to be more responsive to the protective effects of social support as well (Kaufman et al., 2004; Kilpatrick et al., 2007).

In essence, then, the early family environment may provide the groundwork for social competence and the abilities to enlist social support across the lifespan. In families that are warm and nurturant, children learn to manage threat effectively with a lesser physiological/neuroendocrine toll, and through exposure to good models, they may develop social skills of their own. If they are raised in cold, nonnurturant, or conflict-ridden families, children instead experience threatening events more commonly and learn fewer social competencies, with the result that social support networks may be difficult to develop or use effectively. As such, early nurturance of offspring in response to stress might be thought of as a prototype for social support, which is mirrored throughout life in the many more modest supportive contacts a person encounters across the lifespan.

Are the benefits of being raised in a socially supportive environment conferred genetically or through the environment? In other words, do particularly nurturant parents have particularly socially skilled offspring by virtue of their shared genetic heritage, or does nurturance itself play a role in the acquisition of social skills? Both mechanisms appear to be involved. On the one hand, certain species show genetically based high levels of "licking and grooming" in response to stress (Liu et al., 1997), which are transmitted to offspring as styles that appear in the offspring's nurturant behavior. On the other hand, by cross-fostering offspring to high- or low-nurturant caretakers, the impact of the behavior itself on physiological and social functioning becomes clear. For example, Suomi (1987) assigned rhesus monkeys selectively bred for differences in temperamental reactivity to foster mothers who were either unusually nurturant or within the normal range of mothering behavior. Highly reactive infants cross-fostered to normal mothers exhibited deficits in social behavior, and in adulthood, they tended to drop and remain low in the dominance hierarchy (Suomi, 1991). Highly reactive infants cross-fostered to exceptionally nurturant females, in contrast, showed higher levels of social skills, and in adulthood were more likely to rise to the top of the dominance hierarchy. When highly reactive females became mothers, they adopted the maternal style of their

foster mothers, independent of their own reactivity profile (Suomi, 1987). Studies such as these provide evidence of the behavioral intergenerational transfer of nurturance over and above genetic predispositions (see also Francis et al., 1999).

These studies are significant for several reasons. First, they suggest clear developmental origins for social competencies that may affect social support availability across the lifespan. Second, they provide clear evidence that maternal nurturance can moderate genetic risks typically associated with the potential for maladaptive social behavior. Third, they demonstrate the nongenomic intergenerational transfer of social skills via exposure to nurturant supportive behavior. In short, then, whereas genetic factors may contribute to whether or not an individual is able to develop social competence, early nurturant experience can also be a contributing factor that may extend not only across one's own lifespan, but to one's offspring as well. Although the evidence for such a model is primarily from animals, one would expect that genomic and nongenomic factors may be involved in the intergenerational transfer of social skills and deficits in humans as well.

Gender, Culture, and Social Support

GENDER AND SOCIAL SUPPORT

The previous discussion places a heavy role on mothering, at least in the animal studies implicating nurturance in offspring's social and physiological behavior. This raises the question of whether there are gender differences in the ability to provide social support to others, in its extraction from others, and in its benefits. The research evidence suggests that women provide more social support to others, draw on socially supportive networks more consistently in times of stress, and may be more benefited by social support (e.g., Taylor, Klein, Lewis, Gruenewald, Gurung, & Updegraff, 2000).

Although men typically report larger social networks than women do, in part because of men's historically greater involvement in employment and in community organizations, studies find that women are consistently more invested in their relationships and that their relationships with others are more intimate (Belle, 1987). Women are more involved in both the giving and receiving of social support than are men (Thoits, 1995). Across the lifecycle, women are more likely to mobilize social support, especially from other women, in times of stress. Adolescent girls report more informal sources of support than do boys, and they are more likely to turn to their same-sex peers than are boys (e.g., Copeland & Hess, 1995; see Belle, 1987 for a review). College student women report more available helpers and report receiving more support than do college men (e.g., Ptacek, Smith, & Zanas, 1992; see Belle, 1987 for a review). Adult women maintain more same-sex close relationships than do men, they mobilize more social support in times of stress than do men, they turn to female friends more often than men turn to male friends, they report more benefits from contacts with their female friends and relatives (although they are also more vulnerable to psychological stress resulting from stressful network events), and they provide more frequent and more effective social support to others than do men (Belle, 1987; McDonald & Korabik, 1991; Ogus, Greenglass, & Burke, 1990).

Women are also more invested in their social networks than are men. They are better at reporting most types of social network events, and they are more likely to report getting involved if there is a crisis in the network (Wethington, McLeod, & Kessler, 1987). In an extensive study of social networks, Veroff, Kulka, and Douvan (1981) reported that women were 30% more likely than men to have provided some type of support in response to network stressors. These findings appear to generalize across a number of cultures as well (Edwards, 1993; Whiting & Whiting, 1975).

Studies of caregiving also bear out these observations. Over 80% of this care is provided by mothers, daughters, and wives. For example, in the United States, the typical caregiver is a 60-year-old, low-income woman with a disabled or ill spouse. However, daughters care for aging parents (sons are only one-fourth as likely to give parental care), mothers care for disabled children, and a growing number of caregivers are grandmothers caring for the offspring of their own children who may have drug or alcohol problems or HIV infection (Taylor, 2002). Several studies suggest that men, in contrast, are more likely to institutionalize their wives in response to common causes of the need for caregiving, such as stroke or Alzheimer disease (Freedman, 1993; Kelly-Hayes et al., 1998).

As the previous analysis suggests, women are not only disproportionately the providers of social support, they are also more likely to seek social support in response to stress. Two meta-analyses (Luckow, Reifman, & McIntosh, 1998; Tamres, Janicki, & Helgeson, 2002) examined gender differences in coping with stress and found that women were significantly more likely to seek and use social support to deal with a broad array of stressors. For example,

in the Luckow et al. review, of the 26 studies that tested for gender differences in coping via social support, one showed no differences and 25 showed that women favored social support more. These gender differences are more apparent in the domain of seeking emotional support than for other types of social support.

One might expect that if women seek social support more, are more invested in their social support networks, and report that social support is more important to them than is the case for men, they might be benefited more by social support. A meta-analysis conducted by Schwarzer and Leppin (1989) found support for this hypothesis. Across many investigations, the correlation between social support and good health was approximately .20 for women, but for men, the correlation was only .08.

Women may be somewhat more effective providers of social support than men are as well. For example, Wheeler and colleagues (Wheeler, Reis, & Nezlek, 1983) studied students who remained at college during the December holidays to see who became depressed and lonely in response to this stressful circumstance. The students kept track of how they spent their days, with whom they spent them, and what emotions they experienced during that period. The strongest determinant of how lonely the students were was how much contact they had each day with women. The more time a student, whether man or woman, spent with women, the less lonely he or she was. The amount of time spent with other men, for the most part, did not affect mental health.

Research consistent with this point has also come from studies of the differences between men's and women's abilities to provide social support for each other in times of stress and the protective effects of such efforts. An array of evidence suggests that women may be better providers of social support to men than men are to women (Thoits, 1995). For example, when men are asked where their emotional support comes from, most men name their wife as their chief source of social support and many name her as the only person to whom they confide their personal problems or difficulties (see Glaser & Kiecolt-Glaser, 1994; New England Research Institutes, 1997; Phillipson, 1997); women report that they are likely to turn to a female friend or relative, as well as to their spouse.

These differences appear to translate directly into health benefits. Although marriage benefits both men and women, it benefits men more (Chesney & Darbes, 1998). Thus, for example, the health of married men is better than that of single men, but the health of women is less strongly influenced by marital status. Mortality rates among widowed men are higher than among widowed women, and widowed men who remarry die later in life than those who do not remarry; among widowed women, remarrying has no effect on age of death (Helsing, Szklo, & Comstock, 1981; Stroebe & Stroebe, 1983). As noted earlier, in experimental studies, when women and men are asked to bring their partner with them when they undergo stressful laboratory tasks, men's SNS and HPA axis responses to stress tend to be buffered by the presence of a female partner, but females' responses to stress are often stronger in the presence of a partner than when alone (see Kiecolt-Glaser, & Newton, 2001). Moreover, the downside of social contacts discussed earlier, namely the potential for conflict and other negative interactions, appear to weigh more heavily on women than on men. Specifically, in a large-scale review, Kiecolt-Glaser and Newton (2001) report that wives show stronger heart rate, blood pressure, and HPA axis changes during marital conflict than do husbands.

In a theoretical model that provides a framework for these observations, Taylor and colleagues (2000) suggested that gender differences in the seeking and giving of social support may reflect, in part, a robust and biologically based difference in how men and women cope with stress. They suggested that, whereas the behaviors of fight-or-flight, namely aggression or withdrawal in response to stress, may be especially characteristic of men, a pattern termed *tend-and-befriend* may be more characteristic of women in response to stress. Tending involves nurturant activities designed to protect the self and offspring that may promote safety and reduce distress. Befriending is the creation and maintenance of social networks, especially those involving other women, that may aid in this process. Their argument is predicated on the evolutionary assumption that, during human prehistory, men and women faced somewhat different adaptive challenges, and as a result may have developed different stress responses to meet those different challenges. Specifically, females of most species, including humans, have primary responsibility for the early nurturing of offspring through pregnancy, nursing, and care in early life. Stress responses in females, then, are likely to have evolved in such a way as to simultaneously protect mothers and offspring. Whereas fight and flight constitute responses to stress that can protect an individual well, tending to offspring and befriending others in a social group may facilitate the joint protection of self and offspring.

Taylor and colleagues suggested that these stress responses may be influenced, in part, by neuroendocrine underpinnings, such as the release of oxytocin and endogenous opioid peptides. As noted earlier, oxytocin is thought to be an affiliative hormone that may underlie at least some forms of maternal and social contact. Because the impact of oxytocin is enhanced by the effects of estrogen, oxytocin's effects are thought to be stronger in females than in males and may be implicated in the maternal tending of offspring seen in response to stress (Taylor et al., 2000).

In summary, then, although both men and women benefit from social support, women tend to give and receive social support from different sources. Women are disproportionately the support providers to children, to men, and to other women. The support that they provide also appears to translate directly into health benefits. When men seek social support, on the other hand, they are most likely to do so from a partner, and they show clear health benefits from having a marital partner. Overall, women are somewhat more likely to give social support, seek it out in times of stress, and benefit from it, patterns that may have evolutionary significance and biological underpinnings (Taylor et al., 2000; Taylor, 2002).

CULTURE AND SOCIAL SUPPORT

Culture is another variable that may moderate how social support is perceived or received. On the one hand, there is a large literature to suggest that the benefits of social support for mental and physical health extend across many cultures. On the other hand, the possibility that support is experienced differently in different cultures is an important issue that has not been widely addressed. Is there any reason to believe that particular cultural dimensions might be related to how and whether social support is experienced or used in response to stress?

Considerable research suggests that people from East Asian cultural contexts view the maintenance of harmony within the social group as an overarching goal. Any effort to bring personal problems to the attention of others to enlist their help may be seen as undermining that harmony or making inappropriate demands on the social group. Accordingly, the appreciation of these norms may lead people to avoid taxing the system by bringing their problems to the attention of others for the purpose of enlisting social support. By contrast, European Americans tend to see ongoing relationships as resources for helping to meet personal needs (Kim, Sherman, & Taylor, 2008). To the extent that social support is seen as a resource, Western Europeans may seek the explicit help of family and friends to help themselves cope more successfully with stressful events. In a series of three studies, Taylor, Sherman, Kim, Jarcho, Takagi, and Dunagan (2004) found evidence consistent with these points. Across multiple studies, European Americans, relative to Asian Americans and Asians, reported drawing on their social relationships more to help them cope with stressful events. Concern over disrupting the harmony of the group, concern over social criticism or losing face, and the belief that one should be self-reliant in solving one's personal problems were found to mediate the nonuse of social support among those of Asian background.

Social support is thought to be a universally helpful resource, however, which suggests that there may be cultural differences in the ways that it is used or experienced. Forms of social support that do not risk disturbing relationships may be more sought out and be more beneficial for those from Asian cultural backgrounds. Thus, implicit social support, similar to perceived support, may be commonly experienced by East Asians; it refers to the comfort provided through the awareness of a support network rather than through the use of a support network. By contrast, explicit social support, which is used by European Americans, may correspond more closely to the conventional Western definition of a social support transaction; that is, as the use of social networks that involve solicitation of advice, instrumental aid, and emotional support.

The utility of this distinction was demonstrated in an experimental study (Taylor, Welch, Kim, & Sherman, 2007) in which Asian Americans and European Americans were primed with either an implicit or explicit support manipulation. Participants in an implicit support condition thought about a group they were close to and wrote about the aspects of the group that were important to them, whereas participants in the explicit support condition were told to think about people they were close to and to write a letter asking for advice and support during upcoming stressful tasks. Subsequently, participants went through several laboratory stressors. Asian Americans who had completed the implicit support task experienced less stress and had lower cortisol responses to stress compared with those who completed the explicit support task, whereas the reverse was found for European Americans.

Like the research on perceived support noted earlier, implicit social support may have many of the

same mental health and health benefits as social support that is explicitly drawn on in times of stress. There is a potential broader lesson to be learned from these beginning studies of cultural differences in the experience of social support. As research has clarified the ways in which extracting support from others may be costly, the benefits of just knowing that others care for you have come into view.

Providing Social Support

COSTS AND BENEFITS OF PROVIDING SOCIAL SUPPORT

Conceptualizations of social support have been guided by the implicit assumption that support is beneficial for the recipient but costly for the provider. On the surface, this is a fairly sensible assumption. The provision of advice, emotional support, or tangible assistance can be costly to a support provider, at least in time, and potentially in resources as well. Virtually all acts of social support, ranging from listening to a friend's woes about her marriage to taking in family members who are out of work, involve an outlay of at least some resources.

This viewpoint may also have been shaped by evolutionary perspectives on altruism, which encompasses some of the actions usually construed as social support. Altruistic behavior has presented something of a problem for traditional evolutionary theory. Put in its simplest form, the paradox is, how do we pass on our altruistic genes to future generations if those very genes can put us at risk, thereby reducing the probability that we will pass on our genes at all? The warning cry of the sentinel, common to some rodent species, is often presented as an example. On the lookout for danger, the sentinel sees a predator such as a hawk and then lets out a loud and distinctive warning cry that not only sends his companions scampering for safety, but attracts the attention of the predator, increasing the likelihood that the sentinel itself will be the predator's meal. Although the kinds of social support that we commonly find in contemporary society do not typically put people at potentially fatal risk, in our early prehistory, giving aid to another person facing a severe threat (such as a predator) may well have done so, under at least some circumstances, and thus the question is a fair one.

Altruism has largely been rescued by the concept of reciprocal altruism (Hamilton, 1963; Trivers, 1971), which maintains that altruists do not dispense altruism at random but are more likely to aid genetically related others and behave altruistically toward others when there is some expectation of reciprocity. Providing social support is normative, and to the extent that people typically spend their time in the company of familiar social networks of mutual obligation, there is every reason to expect that a favor done by one person may be reciprocated by another at another time.[1]

The idea that support provision is inherently costly is also given credence by research on caregiving. Many people are involved in giving care to elderly parents, spouses, and disabled children. The costs of caregiving can be substantial, as it can be a difficult, grinding, chronic stressor. Over half of contemporary caregivers work outside the home, and many need to modify their job or reduce their hours to accommodate their caregiving. For older people, such caregiving can be a fatal undertaking, with caretakers at high risk for physical and mental health problems. Nearly 60% of elderly caregivers show signs of clinical depression. Evidence of immunocompromise is often present in caregivers, which can leave them vulnerable to flu and respiratory disorders, and they show a poorer response to the influenza vaccine as well (Kiecolt-Glaser, Glaser, Gravenstein, Malarkey, & Sheridan, 1996; Newsom & Schulz, 1998; see also Esterling, Kiecolt-Glaser, & Glaser, 1996). Other studies have found that the stress of caregiving can have adverse effects on wound repair (Kiecolt-Glaser, Marucha, Malarkey, Mercado, & Glaser, 1995), on the regulation of SNS responses to stress (Mills et al., 1997), and on declines in natural killer (NK) cell function (Esterling et al., 1996). Moreover, these immune alterations can persist well after caregiving activities have ceased (Esterling, Kiecolt-Glaser, Bodnar, & Glaser, 1994). Caregivers shake off infectious disease very slowly and are at heightened risk for death. Schulz and Beach (2000), for example, found that the chances of dying in a given 4-year period for an elderly person involved in stressful caregiving were 63% higher than for elderly people without these responsibilities (see also Cacioppo, et al., 2000; King, Oka, & Young, 1994; Spitze, Logan, Joseph, & Lee, 1994; Wu, Wang, Cacioppo, Glaser, Kiecolt-Glaser, & Malarkey, 1999).

Evidence like this would seem to bear out the viewpoint that giving social support is costly. However, the majority of these studies have focused on populations in which any adverse effects of providing care would be expected to be seen. A number of the situations studied involve particularly burdensome caregiving. A number of the samples involved the elderly, who are at particular risk for health problems. Many others have focused on samples

with extreme demands on their time. It is reasonable to think that, although caregiving may provide a glimpse into the extremes of social support provision, it may not characterize support provision generally.

In recent years, the potential benefits of giving social support have become better understood. There are a number of reasons to believe that providing social support to another might be stress reducing for the provider, as well as for the recipient. As the reciprocal altruism perspective just described suggests, providing support to others, as in the form of specific aid, increases the likelihood that there will be people there for you when your needs arise, a perception that can be comforting in its own right, as the perceived social support literature shows. Giving support to others may cement a personal relationship, provide a sense of meaning or purpose, and signify that one matters to others, all of which have been found to promote well-being (e.g., Batson, 1998; Taylor & Turner, 2001). Empirical research suggests that helping others may reduce distress and contribute to good health (Brown, Brown, House, & Smith, 2008; Li & Ferraro, 2005; Schwartz, Meisenhelder, Ma, & Reed, 2003). A study by Brown, Nesse, Vinokur, and Smith (2003) assessed giving and receiving social support in an older married sample and related it to mortality over a 5-year period. Death was significantly less likely for those people who reported providing instrumental support to friends, relatives, and neighbors and to those who reported providing emotional support to their spouses. Receiving support did not affect mortality, once giving support was statistically controlled. The study also statistically controlled for a wide variety of potential contributors to these effects, and the relationships held. This study thus provides important evidence that the giving of support can promote health and/or retard illness progression.

Although the exact mechanisms underlying the benefits of support provision are not yet understood, the animal studies on the impact of nurturant behavior on offspring that were described earlier may be instructive. These studies found that, not only were offspring soothed by nurturant contact, but also the animal providing the nurturant contact was benefited as well. Specifically, benefits to offspring were mirrored in the nurturers in the form of reduced sympathetic arousal and higher observed calm (Wiesenfeld, Malatesta, Whitman, Grannose, & Vile, 1985; Uvnas-Moberg, 1996; see also Adler, Cook, Davison, West, & Bancroft, 1986; Altemus, Deuster, Galliven, Carter, & Gold, 1995). Thus, it is possible that the benefits of providing social support operate through some of the same physiological and neuroendocrine pathways whereby the receipt of support from others seems to achieve its benefits. In addition, if oxytocin and other hormones are implicated in the provision of social support, the anxiolytic properties of oxytocin, coupled with its established role in down-regulating SNS and HPA axis responses to stress, may provide a second potential point of departure for understanding the health benefits of providing social support, as well as receiving it.

Social Support Interventions: Clinical Implications

The implications of social support research for clinical practice and interventions are substantial. As one of the best established resources contributing to psychological well-being and health, clinical efforts to enhance or improve social support are well-placed. Moreover, when people are experiencing intensely stressful events, social support is not inevitably forthcoming. Even when people in a social network make efforts to provide social support, those efforts may not always be effective, as noted earlier. Consequently, a broad array of clinical support interventions have arisen to augment social support, especially for those experiencing gaps in the support they receive from others.

Some of these are family support interventions. For example, when a person has been diagnosed with a chronic condition or illness, the family's participation in an intervention may be enlisted to improve the diagnosed patient's adjustment to the condition. In addition, as noted earlier, involving the family in health behavior change programs may be beneficial for effective management of the disorder (see Taylor, 2008).

Family support interventions may also be emotionally soothing to family members as well, in part by alleviating anxiety that may be generated by incomplete understanding or misinformation. Explaining exactly what the patient's condition is, what treatments will be needed, and how the family can help can mean that support provided by family members may be more forthcoming and effective. In addition, family members may receive guidance in well-intentioned actions that should nonetheless be avoided because they are experienced as aversive by patients (e.g., Dakof & Taylor, 1990; Martin, Davis, Baron, Suls, & Blanchard, 1994).

For the most part, people who need help managing stressful events turn to their family, to friends, and to experts, such as medical caregivers, for the support that they need in times of stress. In some cases, however, that support is not forthcoming. Family and friends may be ill-equipped to provide the kind of support that a person needs for any of several reasons. Some conditions for which a person may require social support are stigmatizing ones, such as HIV, cancer, or epilepsy, and stigmatizing conditions can drive friends and family away (Wortman & Dunkel-Schetter, 1979). In other cases, a person's particular problems, such as the discovery of a chronic disease, can lead to questions and concerns that can be answered only by people with similar problems. Consequently, social support groups have arisen, as potential low-cost and efficient vehicles for meeting unmet social support needs. As of 1979, over 15 million Americans were using social support groups as a primary vehicle for their mental health services (Evans, 1979), and those numbers have grown over the past 25 years. Recent studies estimate that about 25 million individuals participate in support groups at some point during their life (Kessler, Mickelson, & Zhao, 1997), with whites and women more likely to participate than nonwhites and men (Davison, Pennebaker, & Dickerson, 2000).

Social support groups were originally conceived of as small, face-to-face voluntary groups of individuals who came together to solve a problem or help each other cope with handicaps or illnesses, especially through the provision of emotional support (Katz & Bender, 1976). Some of these groups originally were grass-roots organizations formed by patients themselves, but more commonly, these support groups included a professional clinician, either as an initiator and organizer, or as an ongoing counselor who facilitated group interaction. Self-help groups, a particular type of social support group, do not include the participation of a trained professional, once the group is established (Katz & Bender, 1976). Originally, social support groups developed to treat a broad array of problems, disorders, and disabilities, including alcoholism, drug abuse, chronic diseases, loss of a partner through divorce or death, and most commonly, obesity (see Taylor, Falke, Shoptaw, & Lichtman, 1986 for an early review).

Social support groups continue to be a vital resource for the chronically ill and to people managing problems, such as obesity and alcoholism. These groups provide a format for discussions of mutual concern that arise as a result of illness, provide specific information about how others have dealt with similar problems, and provide people with the opportunity to share their emotional responses with others sharing the same problem (Gottlieb, 1988). Such groups can potentially fill gaps in social support not filled by family and friends or may act as an additional source of support provided by those going through the same event.

How effective are these groups? A large number of studies have evaluated the efficacy of social support groups by comparing people who have actually participated in such groups with those who have been waitlisted for participation and/or with nonparticipants, and these studies have generally found beneficial effects (see Hogan & Najarian, 2002 for a review). For example, social support groups have been found to reduce psychological distress for rheumatoid arthritis patients (e.g., Bradley, et al., 1987), cancer patients (e.g, Telch & Telch, 1986), and patients who have had a myocardial infarction (e.g., Dracup, 1985), among many others. As noted, self-help groups may especially benefit those with disorders that are stigmatizing, such as AIDS, alcoholism, breast and prostate cancer, and epilepsy (Davison, Pennebaker, & Dickerson, 2000; Droge, Arntson, & Norton, 1986).

Other benefits include helping patients to develop the motivation and techniques to adhere to complicated treatment regimens (Storer, Frate, Johnson, & Greeenberg, 1987). Support groups may encourage adherence for several reasons. In the course of interacting with others, a participant may learn techniques that others have used successfully to maintain adherence or to cope effectively with a disorder, and adopt those techniques to combat his or her particular barriers to adherence. Because people may commit themselves to change their behavior in front of others in the support group, they may be especially motivated to maintain adherence (e.g., Cummings, Becker, Kirscht, & Levin, 1981). Emotional support and the encouragement that others with similar problems provide can also encourage adherence to treatment.

Although social support groups have the potential to provide both emotional and informational support to participants, they may be better at providing educational than emotional benefits. In a review of cancer support groups described earlier, Helgeson and Cohen (1996) found that educational groups were more effective in meeting patients' needs than were support groups specifically aimed at the provision of emotional support. As noted, because relationships among support group members may

seem artificial or not as intimate as "natural" relationships, relations in the support group may be more appropriate for providing information about the target problem or for managing it, whereas family or close friends may be better sources of emotional support.

A controversial issue in the support group literature has been whether participation in support groups among the chronically or terminally ill may promote better health and long-term survival. An early study of advanced breast cancer patients in a weekly cancer support group provided evidence that participants survived longer than nonparticipants (Spiegel, Bloom, Kraemer, & Gottheil, 1989). However, a follow-up investigation was unable to replicate this finding (Spiegel et al., 2007), and so whether the benefits of support group participation include the slowing of disease progression remains at issue.

Social support groups were widely heralded early in their history because they presaged a low-cost, convenient treatment option for people who might otherwise not have a therapeutic venue for their problems. Some studies, however, suggested that self-help groups actually reach only a small proportion of potentially eligible members (Taylor, Falke, Shoptaw, & Lichtman, 1986), appealing disproportionately to well-educated, middle-class white women. Not only is this the segment of the population that is already served by traditional treatment services, but at least one study (Taylor et al., 1986) suggested that participants in self-help groups were actually the same individuals who were using support services of all kinds, including therapists, ministers, family, friends, and medical experts.

Other factors can limit the effectiveness of support groups as well. In an evaluation of sources of satisfaction and dissatisfaction among members of cancer support groups, reported difficulties included logistical problems of getting to the face-to-face support group on a regular basis, irritation or annoyance over a particular individual or individuals in the group, concerns that meetings were too large, and concern that topics were too narrow and did not cover the issues in which prospective participants were interested (Taylor, Falke, Mazel, & Hilsberg, 1988).

The limited appeal of face-to-face groups has been somewhat offset by the rise of formal and informal internet support groups (Davison, Pennebaker, & Dickerson, 2000). Social networks are clearly expanding. MySpace and other social networking sites have more than 90 million members (Hulbert, 2006), indicating shifting patterns in social ties. In addition to these networking ties, informal social support groups have increased substantially in number over the past decade. While not providing the benefit of face-to-face social contact, they are logistically much easier to access, they are inexpensive (once one has a computer and an internet connection), they provide opportunities to come and go at will and at times of personal need, and they may be a more acceptable mode of help-seeking for men than traditional support groups have been (e.g., Bunde, Suls, Martin, & Barnett, 2006; Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2002). The wealth of information that is now available on the web also means that answers to many specific questions can be answered without long-term participation in a support group.

Because internet-based support groups are a rapidly growing means of providing social support, especially for individuals with chronic illnesses or other stressful conditions, efforts have now gone into evaluating their effectiveness. For example, in one study (Barrera, Glasgow, McKay, Boles, & Feil, 2002), 160 type II diabetes patients were randomized into one of four conditions: diabetes information only; a personal self-management coach; a social support intervention; or a personal self-management coach coupled with the social support intervention. All four conditions were implemented via the internet. After 3 months, individuals in the two social support conditions (both with and without the personal coach) reported significant increases in perceived support, both with respect to their disease specifically and in general.

Internet social support can be useful with children as well. For example, STARBRIGHT World is a computer network that serves hospitalized children, providing interactive health education and opportunities to meet online with children in other hospitals who have similar disorders (Hazzard, Celano, Collins, & Markov, 2002). In one study evaluating the effectiveness of this program, children who participated reported more support, were found to be more knowledgeable about their illness, and were rated as lower in negative coping.

To date, a large-scale evaluation of internet social support resources has not been undertaken, largely because it is difficult to identify all of the sources that are available and all of the ways in which people distinctively use them. What research literature there is, however, suggests that these internet resources are used for many of the same purposes as face-to-face groups are (Davison et al., 2000), and that, as such,

they can be a valuable source of both informational and emotional support.

Conclusion

Across the lifespan, nurturant, supportive contact with others, a sense of belonging or mattering to others, and participation in social groups have been tied to a broad array of mental health and health benefits. Indeed, the social environment appears to be instrumental in helping people develop the abilities to build emotionally supportive ties with others and to construe social support as available.

Socially supportive ties are clearly beneficial in times of stress and may achieve these benefits in large part by helping individuals to control their emotional responses to stressful situations, such as anxiety and depression, and by keeping physiological, neuroendocrine, and immunologic responses to stress at low levels or by promoting faster recovery of these systems following stress. As such, social support has translated into mental and physical health benefits across numerous studies.

Social relationships are inherently double-edged, and so ties with others are not inevitably supportive; gaps in support, misfired efforts at support, and blatantly unsupportive behavior from others in times of stress are well-documented. In part because of these observations, researchers and practitioners are increasingly recognizing that the perception of social support, even in the absence of its utilization, may account for many of its benefits.

Many important issues remain for investigation. Among the most important conceptual issues is the integration of social support into our understanding of the psychological and biological concomitants of relationships more generally. The growing literature on developmental antecedents of social support may be especially helpful in building such an integrative model. The biological mechanisms underlying the benefits of social support also merit continued investigation. In particular, animal studies have been very useful for identifying underlying mechanisms relating social contacts to health outcomes, and this rich source of insights should continue to be mined. Much emphasis has been placed on SNS and HPA axis responses to stress as primary pathways affected by social support. Continued exploration of the possible roles of oxytocin, endogenous opioid peptides, and other hormones is warranted.

Why the mere perception of support has such strong effects on well-being and health merits continued consideration. Does perceived support operate through similar mechanisms as actual social support, or are other factors, such as genetic predispositions, more significant influences? Some issues that will merit additional research are only just being recognized, and these include cultural differences in the experience of social support and the psychological/biological benefits of providing support to others.

On the clinical side, perhaps the most compelling and provocative issues center on the potential health benefits of social support interventions, social support groups, and the enormous role that internet support increasingly plays in people's lives. Targeting people who otherwise may lack sufficient or effective social support, such as patients with stigmatizing conditions and their families and the isolated and/or infirm elderly (Weber, Roberts, Yarandi, Mills, Chumbler, & Wajsman, 2007; Winningham & Pike, 2007), needs to assume high priority.

What is, perhaps, most striking about social support research is the astonishing expansion of contexts and vehicles that have arisen to provide support and to address potentially unmet support needs. Once the value of social support for health and mental health was identified, it became understood for the valuable resource it is. As such, social support is a cornerstone of the important insights that health psychology has yielded.

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Notes

1. Of interest in this context is the observation that, in communal relationships, there are norms explicitly *against* reciprocity (Clark & Mills, 1979), favoring instead the notion that a communal relation with another transcends what would otherwise be obligations for reciprocity.

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