

# Understanding the Links Between Social Support and Physical Health

## A Life-Span Perspective With Emphasis on the Separability of Perceived and Received Support

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**ABSTRACT**—*Social support has been reliably related to physical health outcomes. However, the conceptual basis of such links needs greater development. In this article, I argue for a life-span perspective on social support and health that takes into account distinct antecedent processes and mechanisms that are related to measures of support over time. Such a view highlights the need to distinguish measures of perceived and received support and its links to more specific diseases (e.g., chronic, acute) and stages of disease development (e.g., incidence). I discuss both the novel implications of these theoretical arguments for research on social support and physical health, as well as the potential intervention approaches that are apparent from this perspective.*

*Although social relationships have been extensively studied during the past decade as independent, intervening, and moderating variables affecting stress or health or the relationship among them, almost no attention has been paid to social relationships as dependent variables. The determinants of social relationships, as well as their consequences, are crucial to the theoretical and causal status of social relationships in relation to health*

—House, Landis, & Umberson, 1988, p. 544

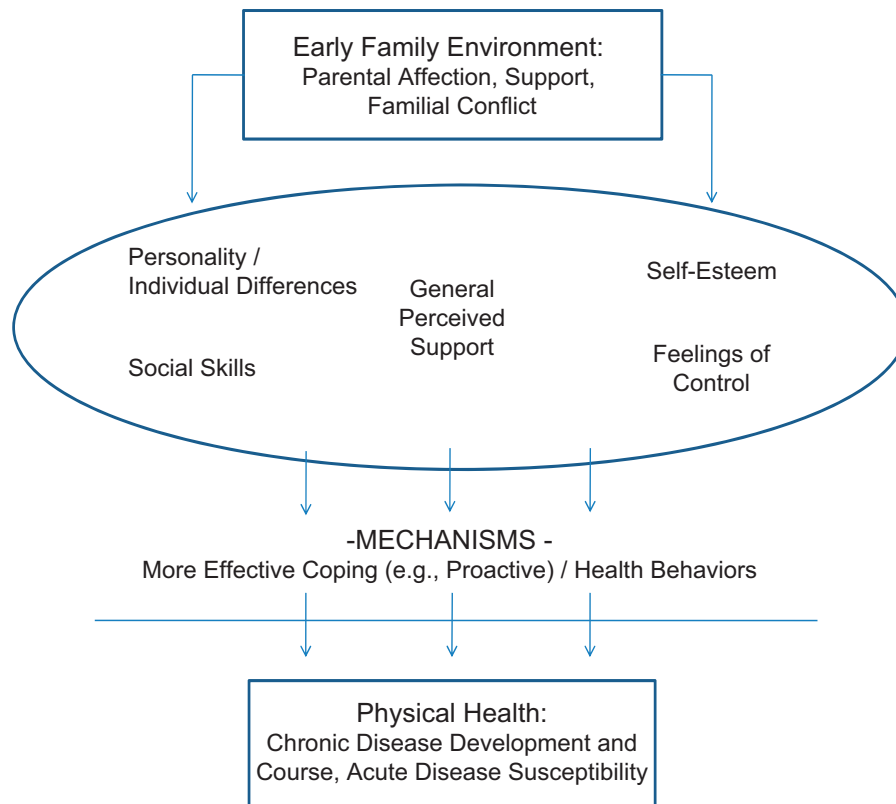
Social support is one of the most well-documented psychosocial factors influencing physical health outcomes (see reviews by Berkman, Glass, Brissette, & Seeman, 2000; S. Cohen, 1988;

House, Landis, & Umberson, 1988; Seeman, 1996; Uchino, 2004). Epidemiological studies indicate that individuals with low levels of social support have higher mortality rates, especially from cardiovascular disease (Berkman, Leo-Summers, & Horwitz, 1992; Brummett et al., 2001; Frasure-Smith et al., 2000; G.A. Kaplan et al., 1988; Orth-Gomér, Rosengren, & Wilhelmsen, 1993; Rutledge et al., 2004; Williams et al., 1992). However, there is also evidence linking support to lower mortality rates from cancer (Ell, Nishimoto, Medianski, Mantell, & Hamovitch, 1992; Hibbard & Pope, 1993; Welin, Larsson, Svärdsudd, Tibblin, & Tibblin, 1992) and infectious disease (Lee & Rotheram-Borus, 2001; Patterson et al., 1996).

Given the links between social support and physical health, it is critical to determine the factors responsible for such links. In this article, I argue that a life-span perspective highlighting the factors that influence the development, utilization, and effectiveness of support over time is crucial to understanding such mechanisms. A life-span approach (e.g., Schulz & Heckhausen, 1996) underscores the developmental context that may influence social support and, hence, may highlight different mechanisms. It is also important to note that chronic diseases follow a similar life-span trajectory and hence may develop hand in hand with such psychosocial processes. These psychosocial factors can potentially place some individuals on positive health trajectories and others on a more negative path and may thus explain part of the variability often seen in the biological aging process.

The main goal of this article is to propose a life-span perspective on social support and health that elucidates potential mechanisms and links to differing aspects of support (i.e., perceived and received support) and disease end points (e.g., incidence, course). The distinction between perceived and received

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**Fig. 1.** General framework on the antecedent factors influencing perceived support, potential mechanisms, and links to health.

support is important, as perceived support has been more consistently related to beneficial health outcomes than has received support (Barrera, 2000; Uchino, 2004; Wills & Shinar, 2000).<sup>1</sup> A life-span perspective can inform theoretical models as to why differences exist between perceived and received support based on the developmental factors associated with these assessments.

This conceptual framework is illustrated in Figures 1 and 2 and is briefly presented here. As shown in the top portion of Figure 1, I propose that individuals with positive early family environments (e.g., parental support, less conflict) develop “positive psychosocial profiles,” including perceived support, certain personality traits and/or individual differences, social skills, self-esteem, and feelings of personal control (see also Flaherty & Richman, 1986; Shaw, Krause, Chatters, Connell, & Ingersoll-Dayton, 2004). These positive profiles are, in turn, predicted to be associated with health via distinct mechanisms, especially proactive coping (Aspinwall & Taylor, 1997), but also via healthy behavioral choices and cooperation with medical regimens (DiMatteo, 2004). I also predict that perceived support

should be more strongly linked to chronic disease development than should received support due to its early familial influences, stability, and association with other positive profiles.

In contrast to perceived support, received support is more of a situational factor that arises in response to stressful circumstances (see Figure 2; Barrera, 2000; Carver, Scheier, & Weintraub, 1989; Thoits, 1986). The health implications of viewing received support as more of a situational factor is that the antecedent conditions and mediators may differ substantially from perceived support. As shown in the top half of Figure 2, the stressor domain and other contextual factors will play a focal role in the effectiveness of coping options (only one of which includes receiving support). On the basis of these contextual processes, it is evident that there are potential psychological pathways at different points of the coping process. For instance, the point when support is received may then have influences on psychological pathways such as alterations in one’s state sense of esteem and/or control in a positive or negative manner (Bolger & Amarel, 2007). An additional pathway includes changes in health behaviors and cooperation with medical regimens that can co-occur with stress (Testa & Collins, 1997). Finally, I predict that received support should primarily influence acute disease susceptibility and the course of diagnosed chronic disease, and this association may be either positive or negative depending on the contextual factors detailed above.

<sup>1</sup>It is important to note that I will be focusing on general perceptions of support (in contrast to relationship-specific perceptions of support) as this is the dominant approach utilized in epidemiological work on support and physical health.

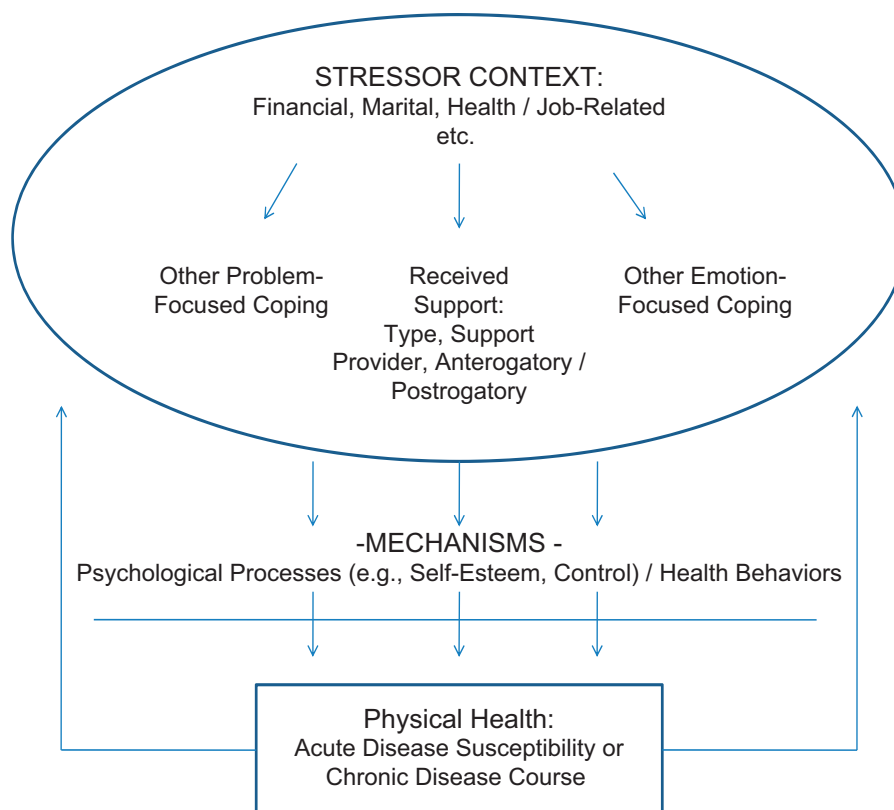


Fig. 2. General framework on the antecedent factors influencing received support, potential mechanisms, and links to health.

A crucial argument in this article is that perceived support and received support are separable constructs based on developmentally salient antecedent processes. As a result, they are related to different pathways and disease outcomes. In the remainder of this article, I will review the evidence for these models, along with unique intervention implications and directions for future study. However, I begin with a brief review of links between social support and health and the measurement of support that forms the basis for this analysis.

### LINKS BETWEEN SOCIAL SUPPORT AND PHYSICAL HEALTH

Morbidity and mortality from disease can be broadly categorized as acute or chronic. In the early 1900s, acute diseases related to infectious pathogens were the major causes of morbidity and mortality. However, changes in sanitation, working situations (e.g., work hours), and medicine (e.g., vaccination) dramatically cut mortality from infectious agents (Cacioppo & Berntson, 2007). As a result, chronic diseases are currently the major causes of morbidity and mortality in the United States and most industrialized countries. The prototypical chronic disease is coronary artery disease, because the beginnings of atherosclerosis (e.g., plaque) can be seen in children, and it develops slowly over time, ultimately cumulating in clinical symptoms for

older adults (e.g., chest pain). This distinction between acute and chronic conditions is important because psychosocial processes such as social support would need to be relatively stable over time for it to influence the development of such chronic conditions. On the other hand, more acute conditions could be related to either stable or stronger fluctuating factors, which then influence susceptibility to disease.

Measures of social support have been consistently related to physical health outcomes. Most recent work on social support conceptualizes it as the functions that are provided by social relationships. These functions may be separated into perceived and received dimensions (Tardy, 1985). Perceived support refers to one's potential access to social support, whereas received support refers to the reported receipt of support resources, usually during a specific time frame (see also Barrera, 1986; Dunkel-Schetter & Bennett, 1990).<sup>2</sup> A majority of studies have found an association between perceived support and lower mortality rates even when statistically controlling for baseline demographic factors and physical health status (e.g., Berkman et al., 1992; Blazer, 1982; Brummett et al., 2001).

<sup>2</sup>Received support is typically assessed by recipient self-reports. However, there is good evidence that these ratings correspond to interpersonal exchanges, as correlations are typically high between recipient and provider ratings of received support (e.g., J.L. Cohen, Lakey, Tiell, & Neely, 2005).

The links between perceived support and mortality appear to be particularly consistent for cardiovascular disease (Berkman et al., 1992; Brummett et al., 2001; Farmer et al., 1996; Frasure-Smith et al., 2000; Orth-Gomér, Rosengren, & Wilhelmsen, 1993; Williams et al., 1992). It is important to note that social support may be linked to cardiovascular problems via its impact on disease development and/or its clinical course. Although more research is needed, there are epidemiological links between perceived support and both the development (Andre-Petersson, Hedblad, Janzon, & Ostergren, 2006; Orth-Gomér et al., 1993; Raikkonen, Matthews, & Kuller, 2001; but see Ikeda et al., 2008) and progression of clinically significant cardiovascular disease (Berkman et al., 1992; Brummett et al., 2001; Coyne et al., 2001). These studies suggesting links between perceived support and cardiovascular disease outcomes are consistent with research utilizing more “intermediate” physiological outcomes in which the perceived availability of social support is related to lower plaque buildup (Angerer et al., 2000; Wang, Mittleman, & Orth-Gomér, 2005), cardiovascular reactivity (T.W. Smith, Ruiz, & Uchino, 2004; Uchino & Garvey, 1997), ambulatory blood pressure (Linden, Chambers, Maurice, & Lenz, 1993; Steptoe, Lundwall, & Cropley, 2000), and components of the metabolic syndrome (Horsten, Mittleman, Wamala, Schenck-Gustafsson, & Orth-Gomér, 1999).

Of particular relevance for this review, there are a complicated set of findings that emerge when one examines the effects of received support on physical health, as these studies are quite variable in their outcome (Uchino, 2004). Indeed, many of these studies find aspects of received tangible support to be associated with higher subsequent mortality rates (Forster & Stoller, 1992; G.A. Kaplan et al., 1994; Krause, 1997; Penninx et al., 1997; Sabin, 1993). Even the use of a well-validated measure of general received support (i.e., the inventory of socially supportive behavior; Barrera, Sandler, & Ramsey, 1981) resulted in inconsistent links with mortality (Oxman, Freeman, & Manheimer, 1995). Due to the fact that many of these studies examine received tangible support, one simple potential explanation based on the concept of support mobilization is that individuals who are more dependent on receiving support are simply more physically impaired to begin with. However, these studies do not appear to support this explanation, as most considered the influence of initial health status or limitations in activities of daily living (G.A. Kaplan et al., 1994; Penninx et al., 1997). Thus, although perceived support has consistent beneficial influences on health, the influence of received support is more variable and sometimes associated with negative influences on physical health outcomes.

### THE CONCEPTUALIZATION OF FUNCTIONAL SOCIAL SUPPORT

The epidemiological work points to the importance of distinguishing between perceived and received support. This is con-

sistent with broader conceptual work on basic social support processes. One approach views social support as primarily an environmental transaction or resource that can be accessed by the individual (Cobb, 1976). The assumption of this approach is that social support is interpersonal in nature. A second major approach views social support as an individual difference factor that is stable over time and has its roots in early parent-child interactions (I.G. Sarason, Sarason, & Shearin, 1986). The assumption of this approach is to view adult support as more of an intrapersonal process that is linked closely to internal, relational schemas. Of course, as noted by I.G. Sarason and colleagues (1986), these views are not necessarily competing, but the challenge is to link these processes to more specific measures and outcomes.

These conceptual distinctions are also tied to specific measurement approaches. Perceived support refers to one's potential access to social support and is more closely linked to the intrapersonal approach. In comparison, received support refers to the reported utilization or exchange of support resources and is more closely related to the interpersonal approach. It is important to note that these two dimensions do not appear to be interchangeable as the separability of perceived and received support is well-documented (Haber, Cohen, Lucas, & Baltes, 2007; Helgeson, 1993; Newcomb, 1990; Wills & Shinar, 2000).

The reasons for the separability of perceived and received support, however, are still unresolved (Wills & Shinar, 2000) and reflect the lack of conceptual development regarding what these measures of support reflect. Although there are other explanations for these differences (see Dunkel-Schetter & Bennett, 1990), one that I expand upon in this article is that they have different origins (or antecedent processes) that make them separable and predictably associated with differing outcomes. As argued by I.G. Sarason, Sarason, and Shearin (1986), measures of perceived support may have their origins in early familial transactions. Familial transactions include processes such as caring, affection, and positive involvement that set the basis for supportive relational schemas (see also Flaherty & Richman, 1986). In addition, researchers have found that perceived support is typically stable over time (despite changes in social circumstances) and linked to reports of parental support and warmth (Mallinckrodt, 1992; Newcomb, 1990; I.G. Sarason et al., 1986; Shaw et al., 2004).<sup>3</sup> Such individual differences in perceived support also influence interpretations and reactions to potentially supportive transactions (Lakey & Cassady, 1990; L.T. Ross, Lutz, & Lakey, 1999; T.W. Smith et al., 2004).

This conceptual distinction between perceived and received support on epidemiological physical health work has been

<sup>3</sup>Of course, it is possible that such stability reflects genetic contributions to social support processes (Kendler, 1997; Kessler, Kendler, Heath, Neale, & Eaves, 1992), such as gene-environment associations (Plomin & Crabbe, 2000). However, future research on the exact nature of these gene-environment interactions for social support processes will be needed to clarify such potential links.

minimal. Thus, in this review, I argue for the importance of a life-span perspective on support that can provide unique insight into (a) why perceived and received support are related to different outcomes, (b) potential associations to distinct aspects of physical health outcomes, and (c) its broader implications for research and interventions. These issues are elaborated below.

### THE DEVELOPMENTAL ANTECEDENTS OF PERCEIVED SUPPORT

The dominant paradigm for examining developmental influences on relationships is related to attachment styles. The concept of attachment has its roots in the writings of Dr. John Bowlby (1982), who argued for the existence of an organized behavioral attachment system that mediates infant responses to threat or distress. Because of the dependency of the infant, adult caretakers become a symbolic “safety net” that the infant relies on during times of distress. This attachment process develops over time and is based on repeated interactions with the primary caretaker. If these interactions are positive, infants can come to rely on the caretaker as a reliable source of protection and support and hence develop a secure attachment style. However if these interactions are inconsistent or negative, infants may develop more ambivalent or avoidant attachment systems (Ainsworth, Blehar, Waters, & Wall, 1978).

The concept of infant attachment has been widely applied to the adult literature on close interpersonal relationships (Cassidy & Shaver, 1999; Diamond, 2001). It is thought that these infant-caregiver attachment processes provide the basis for adult expectations regarding social relationships. More specifically, it is proposed that early infant-caregiver interactions provide the basis for the development of working models of trustworthy and dependable relationships (Hazan & Shaver, 1987), which is supported by emerging longitudinal evidence (e.g., Belsky, Spritz, & Crnie, 1996; Klohnen & Bera, 1998). These links appear to develop in the context of transactions with early close, interpersonal relationships that cumulate in positive self-other representations (Baldwin, 1992). These internalized processes continue to have an active impact on individuals by influencing the “working” self-concept and interpretation of subsequent relationships (Andersen & Berk, 1998; Baldwin, 1992). Studies do suggest that individuals’ perceptions of their early familial experiences are related to their subsequent perceptions of support (Boyce, 1985; Doucet & Aseltine, 2003; Engels, Dekovic, & Meeus, 2002; Flaherty & Richman, 1986; Malinckrodt, 1992; I.G. Sarason et al., 1986; Shaw et al., 2004). In one such study, participants completed ratings of their emotional closeness to their parents while in medical school (Graves, Want, Mead, Johnson, & Klag, 1998). A 30-year follow-up of these individuals found that these initial ratings of parental closeness were associated with a greater number of close contacts that individuals perceived were available for social support at midlife.

If perceived support is linked with attachment security and develops in the context of early, positive familial interactions, the question at hand becomes much broader. What else codevelops in the context of such supportive familial environments (Shaw et al., 2004)? One possibility is that perceived support may then be related to personality processes or other individual difference factors, such as attachment style as noted above. Studies in this regard suggest that more securely attached individuals report greater perceived social support (Anders & Tucker, 2000; Cozzarelli, Sumer, & Major, 1998; Ognibene & Collins, 1998). In fact, it is clear that perceived support is related to other personality/individual difference factors, especially higher trait optimism and extraversion and lower loneliness, neuroticism, and hostility (Gallo & Smith, 1999; Pinquart & Sorenson, 2001; T.W. Smith, 1992; Suls & Bunde, 2005; Uchino, Vaughn, & Matwin, 2008).

It is important to note that I focus on the personality/individual difference factors above, as they have established links to physical health outcomes and appear to have significant interpersonal origins (Cacioppo & Patrick, 2008; Heinrich & Gullone, 2007; T.W. Smith & Gallo, 2001; Suls & Bunde, 2005). For instance, loneliness is linked, in part, to less secure parental attachments and lack of positive family involvement (Kerns, Klepac, & Cole, 1996; Lobdell & Perlman, 1986; Weiss, 1973). Although earlier work focused on the potential spurious overlap between perceived support and personality/individual differences (i.e., biased perceptions of support; Bolger & Eckenrode, 1991), subsequent work suggests that personality was not responsible for links between perceived social support and more objective indices of health (e.g., physiological functioning; see S. Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997; Kiecolt-Glaser, Dura, Speicher, Trask, & Glaser, 1991; Uchino, Cacioppo, Malarkey, Glaser, & Kiecolt-Glaser, 1995). As a result, more recent studies have focused on the moderating role of personality or other individual differences on perceived support. This emphasis is consistent with the proposed profile approach depicted in Figure 1, in that the combination of personality/individual difference factors (e.g., hostility, loneliness) and support appear to explain additional variance in health outcomes (e.g., Knox et al., 2000; Knox et al., 1998; O’Donovan & Hughes, 2007; Orth-Gomér & Uden, 1990).

The early family environment also influences a broad array of other psychosocial processes relevant to physical health (Repetti, Taylor, & Seeman, 2002). Infants who are insecurely attached show less effective coping in response to arousing stimuli (Nachmias, Gunnar, Mangelsdorf, Parritz, & Buss, 1996). These results appear to generalize to children and adults, as factors such as low family support have been related to poorer coping strategies (Hardy, Power, & Jaedicke, 1993; Valentiner, Holohan, & Moos, 1994). In addition, children from more conflicted families have difficulty with self-regulation, as evidenced by greater emotional reactivity to interpersonal situations (Ballard, Cummings, & Larkin, 1993; Davies & Cummings, 1998).

Such early familial processes also influence the development of basic social competencies (Repetti et al., 2002). The development of such social skills is critically important as it is related to positive outcomes such as the formation of supportive social networks (S. Cohen, Sherrod, & Clark, 1986), and interventions in children that improve social skills are linked to improvements in peer acceptance and support (Bierman, 1986; Bierman & Furman, 1984; Drentea, Clay, Roth, & Mittleman, 2006). In one relevant study, Landry, Smith, Miller-Loncar, and Swank (1998) examined mothers' responsiveness to their infants' cues. They found that the mother's sensitivity to such cues predicted greater infant growth in social skills over the next several years. These data are consistent with work linking perceived support to higher ratings of social skills from independent observers during social interactions (B.R. Sarason, Sarason, Hacker, & Basham, 1985).

Research on early family environment and links to other positive psychosocial factors is also consistent with the proposed framework (B.R. Sarason, Pierce, Bannerman, & Sarason, 1993). For instance, a number of theoreticians have argued for the importance of familial processes on the development of self and feelings of control (e.g., Bowlby, 1982; Kohut, 1971). These processes result in an overlap between self–other representations (e.g., self-concept; Andersen & Berk, 1998; Baldwin, 1992; Ogilvie & Ashmore, 1991). Researchers also found links between perceived support and feelings of control, self-efficacy, and self-esteem (Atienza, Collins, & King, 2001; B.R. Sarason et al., 1993; Shaw et al., 2004; Symister & Friend, 2003). These associations are important because these psychological factors appear to have influences on physical health in their own right (Shaw et al., 2004).

An important question based on this framework is “What are the implications for the support and health link?” As noted earlier, I propose that individuals with positive early family environments (e.g., parental support, less conflict) develop positive psychosocial profiles. As depicted in the top portion of Figure 1, these positive profiles include certain personality traits and/or individual differences, social skills, self-esteem, and feelings of personal control. Although I use the general term *personality/individual differences*, I am referring specifically to those that have been shown in prior research to be health relevant and linked to perceived support (i.e., secure attachment, loneliness, low hostility, low neuroticism, high optimism; see Uchino et al., 2008). As reviewed earlier, the literature that examines these factors separately in relation to the early family environment is consistent with such a positive profile (Heinrich & Gullone, 2007; Repetti et al., 2002; T.W. Smith & Gallo, 2001).

As shown in the middle portion of Figure 1, these positive profiles are in turn predicted to be associated with health via distinct mechanisms. That is, such individuals can cope more effectively, flexibly, and proactively with life stressors. They have choices and a broader skill/coping set that can be used to

manage and anticipate the challenges in life. For instance, the simple perception of support or high self-esteem can influence adaptation to stress by activating more adaptive appraisal patterns and coping behaviors (e.g., challenge appraisals in the context of more controllable stressors; S. Cohen, 1988). Of particular importance is that perceived social support may also be related to greater proactive coping (Aspinwall & Taylor, 1997) and existing longitudinal studies tend to find support to be related to lower stress exposure (McFarlane, Norman, Streiner, & Roy, 1983; Russell & Cutrona, 1991; Wills & Cleary, 1996). This stress prevention pathway is an understudied but important way by which such psychosocial processes can ultimately influence health outcomes (Aspinwall & Taylor, 1997).

These positive psychosocial profiles are also predicted to be related to disease via healthier behavior choices (e.g., diet, cooperation with medical regimens). For instance, perceived support has been linked to better health behaviors, including fruit and vegetable consumption, exercising, and smoking cessation (Reblin & Uchino, 2008). Moreover, at least part of the link between social support and mortality is explained by such behavioral pathways (Uchino, 2004). Perceived support is also linked to better adherence to medical regimens in chronic disease populations (DiMatteo, 2004).

A unique feature of Figure 1 is represented in the bottom box and includes the predicted links between these processes and physical health outcomes. This framework predicts that perceived support should be more strongly linked to chronic disease development than should received support due to its early familial influences, stability, and association with other positive profiles. As reviewed earlier, there is evidence of general perceived support's role in the development of cardiovascular disease (Orth-Gomér et al., 1993; Raikonen et al., 2001; Steptoe et al., 2000; Wang, Mittleman, & Orth-Gomér, 2005). Of course, given the stability of perceived support, it may also influence susceptibility to acute diseases via processes such as impaired immune function that may set the stage for infectious disease development (Kiecolt-Glaser & Glaser, 1995).

One immediate question that arises as a result of this positive-profile conceptualization relates to the more precise role of perceived support as a risk factor. For instance, is it the case that social support is even necessary to the profile? A comprehensive profile approach (e.g., latent profile analysis) will be necessary to more definitively test this possibility on relevant health outcomes. However, there are several lines of evidence on the importance of social support for understanding such profiles. First, perceived support is typically correlated with these relevant personality, individual difference, and psychological factors (S. Cohen, 1988; Uchino, 2004). Moreover, the magnitude of these correlations range from .2 to .5, suggesting shared but not redundant variance (Pinquart & Sorensen, 2001; Procidano, 1992; Symister & Friend, 2003). There are also joint contributions by perceived support and personality factors on health-related outcomes (Knox et al., 1998; O'Donovan & Hughes,

2007; Uden, Orth-Gomér, & Elofsson, 1991), which is consistent with the profile approach. For instance, the combination of high hostility and low support appears to be associated with greater underlying coronary calcification (Knox et al., 2000). Using latent profile analyses, Ko, Berg, Butner, Uchino, and Smith (2007) also found that both personality and perceived support contributed meaningfully to aspects of successful aging. Thus, social support appears important to understanding the nature and health relevance of these positive profiles, although future research will provide more definitive tests of this conceptual framework.

### THE SITUATIONAL NATURE OF RECEIVED SUPPORT

In contrast to perceived support, received support is less likely to represent early developmental (e.g., parental) influences. This is not to say that there are no early familial influences on received support or situational influences on perceived support (Lakey, in press). I will return to such links later in the article. However, received support is more likely to represent a situational factor that is sought or provided in response to stress (Barrera, 2000). This conceptualization is consistent with various coping models that include support seeking as a potential resource (Carver et al., 1989; Thoits, 1986). Of course, when we are under stress, network members may also spontaneously offer support in an attempt to help us cope. Bolger and Amarel (2007) have termed this an *anterogatory process* (prior to seeking support) in contrast with a *postrogatory process* (after decision to seek support). However, most existing received support measures (including those used in epidemiological work) do not separate these processes. I will return to a discussion of this issue later in the review.

A main point of this conceptualization of received support is that it is only one of many coping options available to the individual and its effectiveness may depend heavily on the context (Berg & Upchurch, 2007; Suls & Fletcher, 1985). For instance, problem-focused coping strategies are more beneficial for relatively controllable forms of stress. This perspective is also found in the matching hypothesis of support, which predicts that stress-buffering is most effective when the type of support matches the needs or challenges of the stressful event. More specifically, the matching hypothesis predicts that informational and tangible support should be most effective for controllable events (e.g., preparing for a job interview), whereas emotional and belonging support should be most effective for uncontrollable events (e.g., job layoff; Cutrona & Russell, 1990). Similarly, Horowitz and colleagues (2000) argue that the person seeking support wants something (i.e., has a goal) and that more beneficial influences might be obtained if the support provider is able to understand such goals and the appropriate response (e.g., action-facilitating support for agentic problems). Thus, received support can have either positive or negative influences depending on the context.

The literature on received support suggests negative reactions to some support attempts (Bolger, Zuckerman, & Kessler, 2000; Helgeson, 1993; Newsom, 1999), which is consistent with the argument. In one study, Lehman, Ellard, and Worthman (1986) examined this possibility in a sample of bereaved participants. They found that bereaved participants were readily able to recall support attempts that were both helpful and unhelpful. Actions such as expressing concern and contact with similar others were viewed as helpful, whereas giving advice and encouraging recovery were seen as unhelpful. It has also been found that the receipt of informational and tangible support tends to be viewed as less nurturant and more controlling than is either emotional or belonging support (Trobst, 2000). These data suggest that the type of support received in a particular stressor context is important and may be responsible for some conflicting findings on received support (Helgeson, Cohen, Schulz, & Yasko, 2000).

One important issue that bears on the present argument is that if there are circumstances under which received support is less effective, why do such negative effects sometime occur? One possible explanation is based on the finding that stressful circumstances are usually associated with increased support-seeking. Those who report greater levels of received support are actually under more severe stress (Barrera, 1986). One implication of this argument is that researchers may need to follow the effects of received support in stressed populations over longer periods of time because initially it may represent an individual's attempt to mobilize support. Only over time may received support eventually help one resolve the stressor (Barrera, 1986).

A second reason why received support may sometimes fail is related to the provider of support. Anxiety on the part of the support provider may interfere with the retrieval of effective support skills (Gottlieb, 2000). Lehman and colleagues (1986) reported that nonbereaved individuals' reports of effective support matched well with that of the bereaved sample. If people know what to do than why did so many bereaved individuals report unhelpful support attempts by individuals in their network? The authors hypothesized that people interacting with someone undergoing such a stressful event feel anxious about these interactions because they would not want to do or say anything that would upset the individual. Ironically, this anxiety makes it difficult to be an effective support provider as individuals may slip into more automatic or casual modes of support provision that may then be viewed as unhelpful.

A third reason is based on the possibility that conflict in relationships can undermine the effectiveness of received support. We have shown in a number of laboratory studies that the coexistence of positivity and negativity in relationships can decrease the efficacy of received support (Holt-Lunstad, Uchino, Smith, & Hicks, 2007; Uno, Uchino, & Smith, 2002). For instance, Holt-Lunstad and colleagues (2007) randomly assigned participants to interact with an ambivalent (containing both positive and negative aspects) or supportive (containing pri-

marily positive aspects) friend. Individuals receiving support from an ambivalent friend did not appear to benefit from the support, as evidenced by their higher levels of distress and systolic blood pressure reactivity during a disclosure task.

A final possible explanation for why received support may not be beneficial is related to the possibility that it is associated with a drop in self-esteem or threat to one's sense of independence (Bolger et al., 2000; Martire, Stephens, Druley, & Wojno, 2002; Nadler & Fisher, 1986). These changes may in turn offset any benefits of received support. This point is illustrated in work by Niall Bolger and his colleagues (2000), who have argued that the best form of received support may be those acts that are not actually noticed by the recipient as supportive. In one intriguing study on what is termed *invisible support*, Bolger and colleagues (2000) followed couples in which one member was preparing to take the stressful New York State Bar Exam. Diaries on received support were completed over a 1-month period. The results of the study revealed that there were many instances in which the partner reported providing support that was not noticed by the recipient. Further, the provision of invisible support was associated with the lowest levels of depression during the study period (also see Bolger & Amarel, 2007; but see Gable, Reis, & Downey, 2003).

More recent research on invisible support is starting to clarify why received support might have detrimental influences under some situational contexts (Bolger & Amarel, 2007). In a series of laboratory studies, Bolger and Amarel (2007) found that invisible support (posed as a coping question aimed at the experimenter instead of the participant during an upcoming stressor) was associated with smaller increases in distress. They also found that these effects were mediated by individuals communicating a sense of inefficacy to the person about to undergo stress. These findings suggest that eliminating the possible negative effects on a person's sense of esteem may reveal beneficial influences of received support (e.g., perhaps emphasizing the normative nature of the support), providing the support meets the needs of the situation.

It should be noted that laboratory studies do document beneficial influences of received support on physiological reactivity during acute stress (Gerin, Pieper, Levy, & Pickering, 1992; Lepore, Allen, & Evans, 1993). In these laboratory studies, either a friend or the experimenter provides the participant with support while they are undergoing a standardized stress task (e.g., speech). The most common support provided has been emotional support conveyed in a nonthreatening manner that matches the needs of the current situation (e.g., esteem-building). In fact, the receipt of emotional support is typically viewed as more nurturant and less controlling than either informational or tangible support (Trobst, 2000). Again, these data make clear that the effectiveness of received support may depend heavily on the context, with beneficial influences more likely when there is a match between the type of received support and the context (Berg & Upchurch, 2007).

The health implications of viewing received support as more of a situational factor is that the antecedent conditions and mediators may differ substantially from perceived support (see Figure 2). As shown in the top half of the model, the stressor context will play a focal role in the effectiveness of coping options. These coping options include receiving support (sought or offered), as well as other emotional- (e.g., spirituality) and problem-focused (e.g., planning) coping behaviors.

This framework also highlights the importance of specifying contextual factors that may influence the effectiveness of received support (e.g., type of support, relationship characteristics, timing of the received support). As reviewed earlier, the type of support received is predicted to be critical to its effectiveness within a particular stressor context according to the matching hypothesis (Cutrona & Russell, 1990) and other goal-seeking approaches (Horowitz et al., 2000; Stroebe & Stroebe, 1996). The epidemiological work also points to the possible detrimental influence of received tangible support (e.g., Sabin, 1993). In addition, the presence of conflict in an existing relationship may undermine the effects of received support (Holt-Lunstad et al., 2007). The type of relationships (i.e., familial tie, friendship) also needs consideration, as conflict in involuntary relationships may be particularly harmful (Krause & Rook, 2003).

Finally, the timing of when support is received is also an important contextual factor. According to Bolger and Amarel (2007), if support is received during the anterogatory period, it is more likely to have negative influences on the proposed psychological mechanisms than it would during the postrotatory period, when the decision to seek support has already been made. Also invisible received support is expected to be especially beneficial during the anterogatory period, as it does not negatively impact the mechanisms outlined in the model. In summary, the top half of Figure 2 highlights the contexts and ways that received support can go "right" or "wrong" as a coping mechanism.

The middle of Figure 2 highlights the mechanisms that are salient from the present view of received support. Potential psychological pathways include more state alterations in one's sense of esteem/control in a positive or negative manner, as reviewed earlier. That is, if there is a good match between the stressor context and support received, then more positive outcomes are likely via such mechanisms (Bolger & Amarel, 2007; Cutrona & Russell, 1990; Horowitz et al., 2000). Moreover, health behaviors may also serve as mechanisms. For instance, if received support helps individuals cope with their stress, then more positive health behaviors are likely (e.g., less smoking, better sleep; Stetson, Rahn, Dubbert, Wilner, & Mercury, 1997; Testa & Collins, 1997).

As shown in the bottom box of Figure 2, I also predict that received support should primarily influence acute disease susceptibility and the course of diagnosed chronic disease. However, this association can be either positive or negative (i.e.,



healthy or unhealthy), depending on the contextual processes outlined above. Of course, it is also predicted that ongoing attempts at coping with such diseases can influence received support and coping more generally (Bolger, Foster, Vinokur, & Ng, 1996). For instance, Bolger and colleagues (1996) found that although support was initially mobilized in response to the diagnosis of cancer, the patients' distress was related to an erosion of received support from the spouse over time.

Figure 2 shows several issues in need of further discussion. The first issue is related to the influence of received support on more long-term stress, as chronic stress appears to also influence the development of cardiovascular disease (Ming et al., 2004; Rosengren et al., 2004). A second point is that received support draws, in part, from relationships that are stable over time (e.g., family) and hence might in this way be related to the development of chronic diseases. However, the influence of these processes on the link between received support and chronic disease development should be attenuated because of the potential of chronic stress to erode support (even from close relationships), because the variability associated with the effectiveness of received support in coping with stress, and because it is just one of many coping options. Basically, the presence of chronic stress or stable relationships does not guarantee that the quantity or quality of support received will be beneficial. Nevertheless, these are important empirical questions, as I am unaware of any epidemiological studies that have examined whether received support measured at an earlier point in time predicts the development of cardiovascular disease.

### CONCEPTUAL AND METHODOLOGICAL IMPLICATIONS

I have argued that a life-span perspective has important implications for research linking social support to physical health outcomes. This framework begins to link relevant support processes/measures to more specific aspects of disease (i.e., acute, chronic disease development or course). This model predicts that perceived support should be more strongly linked to chronic disease development than should received support due to its early familial influences, stability, and association with other positive profiles. In comparison, given that received support is more of a situational variable, its influence may depend more heavily on its match to the situational (stressor) context. I believe that this framework has unique research and intervention implications. Due to the life-span perspective, I first start with a consideration of its implications for older adult populations.

#### Implications for an Aging Population

The relevance of this framework for older adults is of particular importance as they represent one of the fastest growing segments of the population (Centers for Disease Control and Prevention, 2003). In the U.S. alone, the proportion of individuals over age 65 will increase from 12.4% in 2000 to 19.6% in 2030. There

will be an almost doubling of older adults over age 65 worldwide by 2030 (Centers for Disease Control and Prevention, 2003). These trends are of particular importance due to age-related changes in functional health status (Kart, Metress, & Metress, 1992), as older adults may have to rely on received support as coping mechanisms more than younger adults do (van Tilburg, 1998).

It is important to note that the life-span literature on the well-being of older adults also suggests variability in outcomes associated with received support. For instance, Liang, Krause, and Bennett (2001) examined an older adult population and found received support to be related to higher levels of depression, whereas no direct effect was found in another study of older adults (Krause, Liang, & Keith, 1990). Other research has similarly found received tangible support to be associated with reduced well-being, whereas received emotional support was associated with positive influences or none at all (Penninx et al., 1998; Reinhardt, Boerner, & Horowitz, 2006).

The variable outcomes associated with received support in older adults reflect the unique circumstances associated with aging that impact the contextual factors shown in Figure 2. According to socioemotional selectivity theory, there are age-related differences in the social networks of older adults due to the salience of emotional goals (Carstensen, Isaacowitz, & Charles, 1999). As a result, close, familial ties are maintained, whereas more peripheral ties are less prevalent (Antonucci & Akiyama, 1987; Carstensen et al., 1999). One implication is that there are more involuntary relationships (e.g., relationships one cannot easily choose to exit) in the social network of older adults (Krause, 2001). This is important because prior work suggests that some of these involuntary ties are a source of conflict for older adults (e.g., Birditt, Fingerman, & Almeida, 2005). In fact, there is considerable stability in the conflict associated with the social networks of older adults (Krause & Rook, 2003), and such conflict may undermine the effects of received support (Liang et al., 2001).

It is also clear that older adults face a number of health-related biological challenges that they may find threatening. The need for received support has the potential to further threaten their sense of independence and control (M.M. Baltes, 1995; P.B. Baltes, 1997; Martire & Schulz, 2007; Schulz & Heckhausen, 1996). Moreover, a distinction is typically drawn between receiving autonomy-enhancing and autonomy-decreasing support (M.M. Baltes, 1995; Martire & Schulz, 2007; Rowe & Kahn, 1987). M.M. Baltes (1995) in particular argues that older adults appear to be subject to the "dependency-support script," in which their dependent behavior is reinforced. In contrast, the independent behavior of the older adult is more likely to be ignored (i.e., "independence-ignore script"). It is important to note that it is the autonomy-enhancing nature of received social support that may be beneficial (Martire & Schulz, 2007), and hence its absence is particularly detrimental to older adults.

This conceptualization also has implications for links between perceived support and health in the aging adult (see Figure 1). First, older adults with high perceived support are predicted to have lower rates of chronic disease development. Thus, they are more likely to have successfully aged in terms of their physical health (Horsten et al., 1999; Wang, Mittleman, & Orth-Gomér, 2005). In a series of studies, researchers found that perceived support moderated age-related differences in resting blood pressure (Uchino et al., 1995; Uchino, Holt-Lunstad, Uno, & Betancourt, 1999). That is, older adults with high perceived support had resting blood pressure levels that were comparable with individuals almost 50 years younger (Uchino et al., 1995). An important point here is that individuals with high perceived support are likely to have more disease-free years than those with low perceived support, with corresponding influences on the quality of their lives and relationships.

Rowe and Kahn (1998) have also distinguished between social, cognitive, and physical health components of successful aging. The proposed framework suggests that, to the extent that perceived support is measured as a component of social engagement, there should be some “evenness” in terms of its links to the other profile (i.e., cognition and physical health; see Ko et al., 2007). However, this framework also points to how unevenness might occur. For instance, measures of received support cannot be assumed to be the same as measures of perceived support, and its inclusion might introduce discrepancies due to the variability often found in the effectiveness of received support. Of course, increased variability is also likely in a sample of older adults, as individuals engage in selection, optimization and/or compensation strategies (P.B. Baltes, 1997). Nevertheless, the current perspective helps in understanding how different measures of support may impact questions surrounding aging constructs that have support processes as an important component.

### Links Between Perceived and Received Support

The frameworks depicted in Figures 1 and 2 assume a separability of perceived and received support, which is consistent with the available literature (Wills & Shinar, 2000). The separability argument is based on the assumption of distinct antecedent processes and not necessarily its statistical independence (Cacioppo & Bernston, 1994). Although separable, perceived and received support are conceptually related under some conditions and may interact in potentially important ways.

As noted earlier, I do not believe that perceived support reflects a total lack of situational influences nor do I believe that received support reflects a total lack of any developmental influences (Lakey, in press). The argument is a relative one, and a statistical link between perceived and received support is consistent with the results of research suggesting that each may influence the other under some contexts (e.g., Haber et al., 2007). For instance, Lakey and Cassady (1990) have argued

from a social-cognitive perspective that perceptions of support may act as a schema that influences one’s interpretation of supportive behaviors. They found that individuals high in perceived support interpreted videotaped support interactions more positively. These studies are consistent with broader social-cognitive work on links between relationship constructs and the interpretation of schema-relevant information (Baldwin, 1992; Holmes, 2000). Likewise, received support can influence perceptions of support, especially during stressful events that more broadly influences one’s social network (e.g., natural disasters; Norris & Kaniasty, 1996). In fact, chronic disease patients or victims of natural disasters have a greater need for received support (Nicassio & Smith, 1995; Norris & Kaniasty, 1996). Such situations allow for greater opportunities for each construct to influence the other (e.g., whether the high perceived support actually materializes when called upon).

Nevertheless, this theoretical analysis makes it clear that these are not redundant constructs. There is an interesting question that arises here: “What are the consequences of receiving support for individuals who are low versus high in perceived support (i.e., interactions between perceived and received support)?” There is very little research that examines this issue, perhaps due to the conceptual overlap that is assumed between these two support measures. One interesting possibility is that, given their more positive interpersonal schemas, individuals with high perceived support may be more receptive and thus benefit more from received support. In comparison, this review suggests an alternative prediction. That is, because of the codevelopment of other positive psychosocial factors (e.g., self-esteem), when support is simply provided, individuals with high support may not benefit because it is deemed unnecessary (discounted) or because it could threaten their codeveloped sense of esteem or control. In one of the few studies that tested this interaction between perceived and received support, I.G. Sarason and Sarason (1986) gave individuals experimentally provided support by telling them that the experimenter would be able to help them during an anagram task if needed. In general, individuals who were provided with a sense of support performed better on the task. However, this performance boost was mostly evident for individuals with low perceived support (see also Lindner, Sarason, & Sarason, 1988).

The present analysis would also predict at what phase in the support process such null or negative influences for received support would occur for individuals with high perceived support. All else being equal, received support is likely to be beneficial after individuals with high perceived support have decided (and hence are receptive) to seek support. The support processes is a complex one, and the decision to actually seek support depends on a number of factors. Barbee, Gulley, and Cunningham (1990) have argued that the person under stress must decide to seek support on the basis of their emotions (do they feel embarrassed about the problem?), thoughts (can they handle the problem on their own?), and the quality of their

existing relationships (is there someone that they can turn to about this problem?). As noted earlier, Bolger and Amarel (2007) have distinguished between anterogatory (prior to seeking support; e.g., appraisal) and postrogatory (after deciding to seek support) processes. According to the present analysis, the anterogatory processes for individuals with high perceived support make them more effective at avoiding and coping with stress and, thus, less likely to rely on received support during stress. Hence, issues raised earlier that can influence the effectiveness of received support, such as receiving support from conflicted network members, may not be as applicable. Moreover, in the absence of seeking support, received support may be discounted or it may conflict with the self-esteem of individuals with high perceived support. Note that invisible support should be especially beneficial for these individuals so that it does not threaten their codeveloped self-esteem (Bolger & Amarel, 2007). These “moderational” predictions may explain some of the inconsistencies found in studies of received support and health.

#### Measurement and Data Analytic Implications for the Physical Health Domain

The present conceptualization can be used to guide measurement strategies regarding perceived or received support depending on the research question and disease context. A typical approach in prior work has been to measure either perceived or received support and to examine its association to health outcomes (Uchino, 2004). I believe that this reflects the assumed overlap between these measures in epidemiological work. Thus, there is much less research measuring both components and linking them to relevant outcomes. A more comprehensive approach is important because these are not redundant measures/constructs and because epidemiological work linking received support to mortality suggests some negative influences on health (e.g., Sabin, 1993). It is important to note that the framework can also be used in the measurement of mediators or contextual processes that can be used to clarify the nature of such associations as reduced self-esteem or conflict in relationships.

The framework proposed in this article also suggests alternative analytical approaches to examining these questions. What other factors codevelop in the context of such supportive familial environments (Shaw et al., 2004)? The identification of such positive profiles can be performed via a number of established analytical procedures including cluster, factor, and/or latent profile analyses (e.g., Gallo & Smith, 1999; Ko et al., 2007). These profile scores can then be used in the prediction of physical health outcomes and contrasted with the more traditional approach of examining perceived support as the main predictor of health outcomes. In addition, perceived support may be used as one mediator (or part of a profile) of links between early family environment and long-term health outcomes (Shaw et al., 2004).

In contrast to such a profile approach to perceived support, past research has typically examined these related personality or psychological factors as independent from support by statistically controlling for them (Uchino, 2004). Such an approach, although perhaps necessary in early work, does not reflect the recent conceptual work linking social support to these factors (Gallo & Smith, 1999; Shaw et al., 2004; T.W. Smith & Gallo, 2001). For instance, it is clear that personality factors have significant interpersonal origins and reflect, in part, the perception that one is socially valued (Gallo & Smith, 1999; Leary, 1999). In addition, perceived control can be a cause, consequence, or evidence reciprocal links to perceived support (Krause, 2001).

An approach that is also gaining in popularity is the examination of psychological factors (e.g., esteem, control) as potential mediators of links between social support and health. This approach is especially evident in work examining links between social support and mental health outcomes (Atienza et al., 2001; Symister & Friend, 2003). For instance, in a recent prospective study, Symister and Friend (2003) found that self-esteem was a partial mediator of links between perceived support and depression. However, the salient question that arises from this conceptual perspective is whether self-esteem was a partial mediator or part of a positive profile (with reciprocal links and/or overlapping variance) that includes perceived support (see Holahan & Holahan, 1987). Future research will be needed that can simultaneously examine alternative models (e.g., meditational, profile). Nevertheless, I predict that different mediators and processes are salient when examining measures of received support.

However, there are situations in which one might find the psychological factors of self-esteem and control mediating links between perceived support and health. As noted earlier, some situations allow for greater reciprocal links between perceived and received support (e.g., chronic disease patients or victims of natural disasters; Nicassio & Smith, 1995; Norris & Kaniasty, 1996) and thus may result in such meditational effects. Nevertheless, I still predict that these meditational results reflect the influence of received support that either alters perceived support to more closely reflect situational influences (Norris & Kaniasty, 1996; Wethington & Kessler, 1986) and/or mobilizes other psychosocial factors to deal with the upcoming challenges of potent stressors. Thus, testing such models will require the simultaneous assessment of perceived support, received support, and relevant psychosocial factors in a health context over time. In short, one important implication of this framework is that perceived and received support are not redundant constructs and, hence, questions and models regarding their separable and joint influences are in need of greater consideration.

#### Intervention Implications

There is now strong evidence linking social support to physical health outcomes (Berkman et al., 2000; S. Cohen, 2004; Uchino,

2004). These findings highlight the potential of support interventions to foster positive health outcomes. In fact, there have been hundreds of support interventions in various populations aimed at helping individuals utilize their relationships for such benefits (Hogan, Linden, & Najarian, 2002). Most of these interventions are based in chronic disease populations in an attempt to foster better mental and possibly physical health outcomes (Uchino, 2004). The source of support varies from a new relationship (e.g., physician) to established network ties. In addition, the intervention setting can include either a group (e.g., support groups) or one-on-one setting (Gottlieb, 1988).

I will not attempt to provide a comprehensive review of this large literature (see Hogan et al., 2002; Martire, Lustig, Schulz, Miller, & Helgeson, 2004). However, I will attempt to discuss important issues for future support interventions based on the current framework. As noted by others (e.g., Neely et al., 2006), one important assumption of support intervention is that receiving support is a key factor responsible for links to health. Although perceived support consistently shows such stress-buffering influences, there is much greater variability in stress-buffering studies that examine received support (Barrera, 2000; Uchino & Birmingham, 2008). The present analysis suggests that interventions that conceptualize support in this fashion will need to look more closely at the literature on received support and the importance of considering the stressor context (see Berg & Upchurch, 2007). Although it may be possible for such interventions to increase perceptions of support, the more proximal goal should be to influence needed support that is provided in an effective manner. The possibility that received support is simply one of many coping options is also important, and broader approaches may be necessary to supplement support interventions (e.g., cognitive-behavioral interventions).

The present framework also suggests the need for more comprehensive assessments prior to performing support interventions. Are these individuals with high or low perceived support? Are they experiencing deficits in received support? These questions are important because they might result in more specific interventions depending on such assessments. For instance, individuals with low perceived support might be better candidates for more general cognitive behavioral intervention that focus on a wider set of psychosocial processes that they may lack (e.g., support seeking skills, perceptions of control). However, those with high perceived support might be provided with choices regarding more specific interpersonal exchanges and information that fosters their general understanding of the stressor of interest (e.g., support groups for cancer patients). It may also be important to match particular persons with specific network members to create support dyads that best meet the demands of the situation (Lakey, in press).

It is also clear that most social support interventions focus on individuals who are most at-risk or those who already have psychological, behavioral, or medical problems. An alternative

way of thinking about support interventions is as a form of primary prevention that focuses on healthy individuals. Primary prevention refers to attempts to reduce the probability of a health problem developing (R.M. Kaplan, 2000). Examples include interventions to increase exercise or prevent smoking in healthy individuals. In a compelling analysis, R.M. Kaplan (2000) argued for the promise of primary prevention efforts, especially in light of the more limited public health benefits that seem to arise from secondary prevention efforts that simply focus on the identification and treatment of disease.

Given that many chronic diseases have a long-term etiology and develop over decades (e.g., coronary artery disease), primary prevention efforts in social support interventions may be particularly important to consider. For instance, given the developmental antecedents of perceived support, it is clear that early familial interventions are an important starting point. Such interventions have mostly been conducted in at-risk populations and show promise in fostering more positive child outcomes (Alexander, Sexton, & Robbins, 2002).

This perspective on perceived support also raises the interesting possibility that social support interventions may be usefully applied early in children and adolescents to help them develop positive profiles that then place them on healthier trajectories (e.g., Eggert, Thompson, Herting, Nicholas, & Dicker, 1994). This literature has also focused on a different set of outcomes (e.g., social interactions, grade point average); however, existing studies suggest that social skills training in adolescents results in positive social and academic outcomes (Dirks, Treat, & Weersing, 2007), although the long-term nature of such interventions need further evaluation (Beelmann, Pflingsten, & Losel, 1994). One strength of the current framework for support interventions is that it highlights differing potential entry points, as well as approaches, depending on whether one is focusing on perceived or received support.

## FUTURE RESEARCH DIRECTIONS

Based on the present framework, there are a number of issues that I see as being particularly important to address in future studies linking social support to physical health. The first and most general is the need to incorporate a life-span approach that considers the antecedent processes responsible for distinct measures of support and how they emerge and change over time to influence risk for disease. For instance, early familial processes appear to cast long shadows on perceived support that only become apparent from such a vantage point (Graves et al., 1998). In addition, the support needs of older adults need stronger consideration given developmental changes in social networks and functional health status. However, there is a lack of theoretical and empirical work that highlights such antecedent processes, despite their potential usefulness to the design of relevant interventions (House et al., 1988; G.A. Kaplan, 1995).

It should also be noted that perceived and received support may differ on other dimensions besides the ones being currently examined (i.e., intra- and interpersonal). For instance, perceived support is more abstract and subjective, whereas received support tends to be more concrete and objective (e.g., a specific time frame). In addition, although perceived support is more stable than received support, received support may also be stable under some circumstances (e.g., Lakey, in press). Thus, although I have focused on one important difference between these assessments, given the lack of conceptual work that has addressed this issue, more research is needed on other potential meaningful distinctions and its implications for the present model and social support theory more generally.

Another important research question relates to links between the concepts presented in this framework and other indices of support. General perceived support and received support are the dominant approaches in epidemiological work, so a focus on these measures is necessary (Uchino, 2004). However, there are other measurement approaches that are important to consider, such as relationship-specific measures of perceived support. Research by Lakey and colleagues (e.g., Lakey, McCabe, Fisicaro, & Drew, 1996; Lakey & Scoboria, 2005) suggest that these measures are related, but distinct from general perceptions of support (see also Davis, Morris, & Kraus, 1998; Pierce, Sarason, & Sarason, 1991). Moreover, relationships-specific assessments appear to more strongly reflect Trait  $\times$  Situational influences (Lakey et al., 1996). This suggests that relationship-specific measures of perceived support may be reflective of processes operating in both Figures 1 and 2. Studies that focus on the quality of marital relationships suggest more general links to disease development and its course (Kiecolt-Glaser & Newton, 2001). Of course, for such measures to have an impact on health, it is probably necessary for the relationship to be an important one (e.g., parents, spouse, children). Future research will be needed to test these possibilities, along with the possible impact of support erosion or conflict on such relationship-specific processes (Bolger et al., 1996; Manne & Glassman, 2000).

It is also the case that multidimensional assessments of social support have conceptual advantages over aggregate indices of support (Cutrona & Russell, 1990). However, most of the prior work on social support and health has focused on such aggregate measures (Uchino, 2004). The few epidemiological studies that focus on distinct components of perceived support do not suggest differences as a function of support type (i.e., perceived emotional support; Berkman et al., 1992; Blazer, 1982; Falk, Hanson, Isacson, & Östergren, 1992). However, epidemiological studies on received support appear to show the most negative influences for received tangible support (Forster & Stoller, 1992; G.A. Kaplan et al., 1994; Sabin, 1993), and hence, support type was included as a contextual factor in Figure 2. Very few studies contrast the health effects of different support types within the same study, so it will be important for future research to more fully examine its impact on the proposed models.

In general, this life-span perspective raises questions about the dominant single risk factor approach seen in the literature. The present framework highlights the need to examine multiple psychosocial risk factors in combination (see Gallo & Smith, 1999; G.A. Kaplan, 1995; Williams, Barefoot, & Schneiderman, 2003) in order to supplement the more traditional approach of focusing on single risk factor models. The later approach is more tractable, but it ignores considerable research on how these factors may codevelop and have significant early family origins (Repetti et al., 2002; Shaw et al., 2004; T.W. Smith & Gallo, 2001). In fact, the present analysis suggests that the adoption of a profile approach may explain more of the variance in health outcomes and better reflect the phenomenon of interest. The need for such an approach was foreshadowed by early work on successful aging in which the combination of social support and feelings of control were identified as important psychosocial factors influencing the biological aging process (Rowe & Kahn, 1987). It is important to note that this line of research has started to incorporate more of a profile analysis to examine aspects of successful aging (Ko et al., 2007; J. Smith & Baltes, 1997). Of course, such an approach lacks the specificity often seen in single risk factor modeling, but it may provide a more comprehensive analysis of complex health outcomes (G.A. Kaplan, 1995). Provided that a broad range of measures are available, these two approaches can be simultaneously modeled to examine their fit to the data (e.g., Shaw et al., 2004).

A life-span perspective also highlights the need to better understand the stage of disease potentially impacted by social support. There is evidence of perceived support's role in the development and course of cardiovascular disease, as well as susceptibility to infectious illnesses (Berkman et al., 2000; Uchino, 2004). The present framework makes unique predictions about the relative role of perceived and received support on chronic disease development. Although more research is needed, there is evidence suggesting that perceived support plays a role in lower cardiovascular disease incidence (Andre-Petersson et al., 2006; Orth-Gomér et al., 1993; Raikonen et al., 2001; but see Ikeda et al., 2008). However, I know of no research examining links between received support and the development of cardiovascular disease, even in more chronically stressed populations. More generally, research on social support and health (including my own) has typically examined either perceived or received support, with little theoretical justification for its link to specific stages of disease. Therefore, future epidemiological and clinical/laboratory work will be needed to test these predictions regarding the stage of disease impacted by distinct measures of support.

In this life-span model, I have highlighted the health-relevant factors that appear to codevelop in the context of supportive, early family environments. These factors were chosen mostly because of existing evidence that also links them to physical health outcomes (Krause, 2001; Shaw et al., 2004; T.W. Smith & Gallo, 2001). Future research will be needed to determine

the more precise combination of factors that in turn influence health at both the idiographic and nomothetic levels of analysis. Identification of other relevant factors may further clarify processes outlined in the model. For instance, there is a small but intriguing literature on the physical health benefits of being a support provider (Brown, Nesse, Vinokur, & Smith, 2003). Given evidence for early familial influences on prosocial behavior (e.g., Knafo & Plomin, 2006), being a support provider may be another behavioral pathway associated with perceived support that has corresponding health-relevant affective and physiological correlates (Brown & Brown, 2006). Received support, in comparison, is more clearly related to support provision (Gleason, Iida, Bolger, & Shrout, 2003; Liang et al., 2001; Sprecher, 2001). Researchers have found that equity between received and provided support (i.e., under- or overbenefitting) may be important in considering the overall links between received support and various outcomes (Gleason et al., 2003; Sprecher, 2001), which is consistent with a contextual approach. However, more work is needed on the separable and joint contributions of these support constructs in a physical health context.

There is also a pressing need to elucidate the mechanisms responsible for social support and health links (House, 2001). Proposed mediators are evident at multiple levels of analysis and include psychosocial (e.g., appraisals) and behavioral (e.g., health behaviors) factors (Berkman et al., 2000). The present framework makes unique predictions about the more proximal pathways linking different aspects of support to health outcomes. For instance, proactive coping is proposed to be an important mechanism linking perceived support to longer term health outcomes (Aspinwall & Taylor, 1997), whereas more “reactive” coping (i.e., coping in response to stress) is thought to be partly responsible for received support influences. Thus, the model encourages the simultaneous consideration of differing pathways and makes competing predictions about such influences.

Finally, there are differing levels of analysis when examining links between social support and health (Berkman et al., 2000). This framework has mostly focused on relevant psychosocial and behavioral processes. However, there are both broader and more specific levels of analysis that need modeling in social support and health work. For instance, cultural processes influence the seeking of support, so the effects of received support may vary accordingly. Asian Americans appear more reluctant than European Americans to seek support during stress due to relational concerns (Taylor et al., 2004). These data suggest that important antecedent processes linking received support to positive or negative outcomes can differ as a function of culture (i.e., relationship concerns versus threats to independence), although the health consequences of such cultural differences need further study.

Likewise, more microlevel biological processes are an important level of analysis and can vary depending on the stage of

disease. For instance, the role of social support in buffering stress reactivity during the development of disease highlights the role of endothelial injury due to mechanical (e.g., shear force) or chemical (e.g., catecholamines) factors as important precipitating events (Krantz & Manuck, 1984). More recent research is focusing on the possibility that inflammatory processes following endothelial injury are crucial due to the migration of macrophages and/or T-cells and the release of cytokines (Libby, 2002; R. Ross, 1999). In comparison, the mechanisms linking low support to the clinical course of diagnosed cardiovascular disease may be related more to the induction of myocardial ischemia, arrhythmias, and thrombosis (Rozanski, Blumenthal, & Kaplan, 1999). This level of analysis thus highlights the need to model different biological pathways depending on the support measure and relevant stage of disease (e.g., perceived support and cardiovascular disease development).

## CONCLUSIONS

In the present analysis, I have argued for the importance of a life-span approach to the examination of the physical health effects of general perceived and received social support. This framework highlights the factors that influence the development, utilization, and effectiveness of support over time. More specifically, the separability of perceived and received support is highlighted by focusing on distinct antecedent processes and mechanisms. This framework also makes unique predictions about the type and stage of disease potentially impacted by these distinct support measures. The benefits of this framework are most evident in the generative nature of the proposed predictions for the literature linking social support to physical health. Prior epidemiological work makes a strong case for the tremendous potential for relationships to influence physical health outcomes. To realize this potential, the complexities of the phenomena from an interdisciplinary perspective need to be modeled. This framework is an attempted step in this direction of fostering social support theory in the health domain and its potentially novel research/intervention implications.

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