The Foundations of Resilience: What Are the Critical Resources for Bouncing Back from Stress?

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Resilience has been defined in so many ways that it is in danger of losing its central place in examining and understanding the human experience of stress. Although resilience is universally referred to as something that is beneficial in relation to stress, there are several different kinds of positive phenomena that have been associated with it (Dyer & McGuinness, 1996). Definitions of resilience have included the ability to bounce back or recover from stress (Carver, 1998; Smith et al., 2008), adapting positively to stressful circumstances or difficulties (Luthar, Cicchetti, & Becker, 2000), not becoming ill or maintaining stability despite stress (Bonanno, 2004), and functioning above the norm in spite of stress or adversity (Tusaie & Dyer, 2004). The variety of ways of defining resilience has made it difficult both for lay people and for social scientists to clearly communicate about how to think about and cultivate resilience. The purpose of this chapter is to focus on a basic and central meaning of resilience as the ability to bounce back from stress and differentiate it from the personal and social resources that may serve as a foundation for it.

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Defining Resilience

The original meaning of the English word resilience is "to bounce or spring back" (Simpson, 2005). The root word for the English word "resilience" is the word "resile," which means "to bounce or spring back" (from re- "back" + salire "to jump, leap"; Agnes, 2005). The typical dictionary definitions of resilience have included phrases that make it applicable to both the physical and the social sciences. The idea that a piece of metal may be able to spring back into shape or its original position is an example of resilience in an engineering context. The idea of a person being able to bounce back and recover strength, spirits, or humor after adversity, misfortune, or a stressful event is the gist of this idea of resilience in a human context. Thus, in psychological terms, the ability to bounce back or recover from stress is closest to the original meaning of the word "resilience" and its root in the word "resile."

However, resilience has come to be associated with several additional meanings including resistance to illness, positive adaptation, and even finding benefits and growth in the context and aftermath of stress. In distinguishing between the other meanings associated with resilience, it may be better to use different words or expressions for resistance to illness, adaptation to stress, and functioning above the norm in spite of stress. Carver (1998) provided a clear distinction between "resilience" as returning to the previous

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level of functioning (e.g., bouncing back or recovery) and "thriving" as moving to a superior level of functioning following a stressful event. In addition, "stress adaptation" could be used for changing or making a positive adjustment to a new situation. Finally, it may be preferable to use a word like "resistance" (as in "stress resistance" or "resistance to illness") to refer to not becoming ill or showing any initial decrease in functioning during stress.

Measures of Resilience

Although several definitions of resilience have been proposed, the measures that have been associated with the word "resilience" have rarely targeted these definitions and have not specifically focused on the ability to bounce back from stress. For example, in the Connor–Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003), resilience is defined by the selective strengths or assets needed to help an individual survive adversity. Specifically, the CD-RISC measures the concepts of control, commitment, goal-orientation, self-esteem, adaptability, social skills, humor, strengthening through stress, and the endurance of pain. Similarly, the Resilience Scale (RS; Wagnild & Young, 1993) attempts to assess an individual's capacity to live a life worth living. Specifically, the RS measures five personal concepts including equanimity, perseverance, meaningfulness, self-reliance, and existential aloneness. Finally, the Resilience Scale for Adults (RSA; Friborg, Hjemdal, Rosenvinge, & Martinussen, 2003) measures factors that are thought to promote resilience in adults. The RSA specifically measures five factors that may promote resilience including personal competence, social competence, family coherence, social support, and personal structure.

Thus, rather than focusing on resilience as bouncing back from stress or any of the other more specific meanings that have been associated with resilience, most measures of resilience have attempted to assess an array of personal characteristics and social factors that may promote resilience. Because of the need to assess and better understand the specific meanings that has been associated with resilience, we developed the "Brief Resilience Scale" (BRS; Smith et al., 2008) in order to assess resilience as the ability to bounce back or recover from stress. While we realize that it is possible to make an argument for associating the word resilience with other specific meanings such as stress resistance, stress adaptation, and thriving and growth, we thought that having a measure of resilience as the ability to bounce back from stress may be a good place to start since it is the original and most basic meaning of the word "resilience."

One primary advantage of defining and assessing resilience in this more specific manner is that it makes it possible to clearly differentiate resilience as the ability to bounce back from the other factors that may promote it. After we developed the BRS, we thought that a logical next step in our research program was to examine its relationship with the potential personal and social resources that may be most likely to increase the ability to bounce back from stress. We also sought to assess resilience and potential resilience resources in a variety of populations: including those who are healthy individuals, patients facing the kinds of stress that call for resilience, and people facing other kinds of challenging situations. Our goal was to identify the personal and social resources that may be most important in providing the foundations for the ability to bounce back from stress. Thus, we now present the potential resources that we assessed and then the kind of samples in which we examined their relationship with resilience.

The Potential Resources for Resilience

What are the most important resources for the ability to bounce back from stress? Rather than including a laundry list of variables that may be related to general positive adaptation, our approach was to identify factors that have been empirically or can be conceptually linked to this specific definition of resilience. One of the most distinctive aspects of resilience as the ability to bounce back or recover from stress is that it

involves a temporal dimension (Carver, 1998). That is, the process of bouncing back from stress may involve three stages: (1) actually confronting an event that is stressful, (2) orienting oneself towards a positive future outcome of the event, and (3) engaging in efforts to cope with it. As with most stage theories, we do not mean to imply that they always occur in this order or that people may go back and forth between them. However, we do think that people generally move through and master these stages in this order and that all three may be critical for the successfully bouncing back from a stressful event. In addition, many of the potentially important resources for resilience can be categorized by which of the above three stages that they best address and we thought it would be important to address each of them. Thus, we decided to identify the factors that may be relevant for each.

First, the ability to bounce back from stress may generally require actually confronting a stressful event. This may sound simple but may often be underestimated in theory and research regarding resilience (Hayes, Follete, & Linehan, 2004). While avoidance or denial may frequently be used to cushion the blow of a stressful event, over the long-term they may be counterproductive and prevent an individual from taking in all the information necessary for successfully recovering. Indeed, when faced with a traumatic event, avoidance may lead to the vicious cycle of both avoidance and reexperiencing that can breed and sustain posttraumatic stress disorder (Lanius et al., 2010). Recently developed mindfulness and acceptance-based interventions have focused more on this present-focused aspect of confronting a stressor than previously developed approaches (Hayes et al., 2004). Thus, we thought that the ability to pay attention to present moment experiences (Kabat-Zinn, 1990) and the ability to be clear about one's emotional experience (Feldman-Barrett, Gross, Christensen, & Benvenuto, 2001) may be important for enabling a person to confront a stressful experience and begin the process of bouncing back. To measure the first we used the Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003) and to measure the second we used the mood clarity subscale of the Trait Meta Mood Scale (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995).

Second, the ability to bounce back from stress may generally require that an individual orients themselves towards a positive future outcome of the event. This may require both a sense of direction and purpose in life (Wong & Fry, 1998) and a sense of optimism that it is possible to move in the direction of achieving one's goals and this purpose (Scheier & Carver, 2001; Smith & Zautra, 2004). Frankl (1963) wrote about how valuable a sense of meaning and purpose and life was for enabling and motivating him to survive living in a concentration camp during WWII. We found that a sense of purpose in life was the most important factor in recovery for people who had total knee replacement surgery (Smith & Zautra, 2004) and others have found that purpose in life has been related to better adjustment to stress (Bonebright, Clay, & Ankenmann, 2000). Optimism, in the sense of the expectation of a successful outcome to a stressful event may be critical in giving people the confidence to begin to engage in efforts to cope with it rather than avoid or deny it (Scheier & Carver, 2003). Optimism has been associated with better mental and physical health in the aftermath of a variety of stressors including coronary artery bypass graft surgery and cancer (Andersson, 1996; Scheier et al., 1999; Schnoll, Knowles, & Harlow, 2002). Thus, because of the value of orienting oneself to a positive outcome to a stressful event, we included the Life Orientation Test-Revised (Scheier, Carver, & Bridges, 1994) to assess optimism and the purpose in life subscale of the Scales of Psychological Well-Being to assess a sense of meaning, purpose, and direction in life (Ryff & Keyes, 1995).

Third, the ability to recover from a stressful event involves efforts to actively engage in efforts to cope with it. The two factors that we thought may be most important here were an active approach to coping (Scheier & Carver, 2003) and the support of other people for the coping process (Cohen & Hoberman, 1983). Although a great challenge of studying coping has been to assess all of the different kinds of strategies that individuals use to cope with stress, researchers have

consistently pointed to an overarching approach coping factor that may be best thought of as active coping (Smith & Zautra, 2008). The idea here is that recovery from a stressful event is more likely with an active approach to dealing with the event rather than passively accepting it or avoiding it. While an active approach to coping can be thought of as a personal resource, social support is the prime example of a social resource that may be particularly relevant for times of stressful events and thus for resilience in the face of stress. There is strong and consistent evidence that social support is related to better health and functioning in the context and the aftermath of a variety of kinds of stress (Cohen & Wills, 1985). Thus, we included measures of both active coping (Carver, 1997) and social support (Cohen, Mermelstein, Kamarck, & Hoberman, 1985; Sherbourne & Stewart, 1991) as resources that may be important for actively engaging in efforts to recover from a stressor.

We decided to include two additional potential resources that may not be as directly tied to one of the three temporal aspects of bouncing back from stress. First, we wanted to include a general measure of spirituality because of the evidence that religion may play an important role in coping with stress and in resilience (Banerjee & Pyles, 2004; Pargament, 1997). Rather than being tied to one of three temporal aspects, we view spirituality as a personal resource that may pervade, help to integrate, and operate in all three. Second, we wanted to include a measure of positive relationships with others as a second social resource that may not as specifically be tied to stress and coping but that may still be linked to the ability to bounce back from stress. We have found that positive relationships with other people may be a unique source of positive emotions (Smith & Zautra, 2008) and positive emotions have been experimentally linked to the ability to recover from stress (Tugade & Fredrickson, 2004). We also thought that positive relations may be related to all three temporal aspects rather than most directly tied to one.

Finally, we decided to include four important demographic factors because they may also be important resources for resilience and because we wanted to include them as control variables. The demographic factors that we included in our analyses were age, gender, education, and income. We thought that age may be related to an improved ability to bounce back from stress because of research showing that emotional regulation and health may improve with age (Scheibe & Carstensen, 2010). We thought that education and income may be related to higher resilience because of evidence that socioeconomic status is often related to better health and functioning (Adler et al., 1994). Finally, we were not sure how gender might be related to the ability to bounce back from stress but thought it would be important to include in order to help determine whether there may be gender differences.

Resilience in a Variety of Samples

Finally, we thought it may be important to examine the relationship between resilience and these potential resilience resources in a variety of individuals and samples. First, we thought it would be important to include healthy individuals and had assessed most of these variables in a large general sample of college undergraduates and in a sample of healthy adult women who served as a control group for a study of women with fibromyalgia. Second, we thought it could be particularly valuable to include patients whom are facing chronic health stressors where stress is high and where resilience may be critical. Thus, we included the sample of women with fibromyalgia and a sample of cardiac patients in a cardiac rehabilitation program. Third, we thought it would be also interesting to include individuals who were facing other kinds of stressors that were not related to health problems but that were voluntarily selected. Thus, we include a sample of first-generation college students (e.g., students without a parent who has attended any college) in their first year of college and a sample of urban firefighters who face both normal adult stressors and traumatic stressors on the job. We thought that this might provide us with important contrasts between what we will call "healthy," "patient," and "at-risk" individuals and also give us a larger total number of participants with which to examine our hypotheses.

Study Hypotheses

Our primary hypothesis was that the variables selected to assess each of the three aspects of the temporal dimension of bouncing back from stress would be related to the BRS. That is, we expected mindfulness and mood clarity to be related to resilience because they may enable a person to confront a stressful event (Brown & Ryan, 2003; Salovey et al., 1995), optimism and purpose in life to be related to resilience because they may be involved in orienting a person towards a successful outcome (Scheier & Carver, 2001; Smith & Zautra, 2004), and active coping and social support to be related to resilience because they are important for engaging in efforts to cope with stress (Cohen & Wills, 1985; Scheier & Carver, 2003). Our secondary hypothesis was that that spirituality (Pargament, 1997), positive relations with others (Smith & Zautra, 2008), age (Scheibe & Carstensen, 2010), income, and education (Adler et al., 1994) would be related to resilience. We had no specific hypothesis about whether resilience scores would vary by gender.

Method

Participants and Procedures

There were a total of 844 participants in the six samples included for this chapter. The samples can be divided into three categories that we will called be "patient" because they have a chronic health problem ($n=260$), "at-risk" because they have voluntarily selected a chronic and challenging stressor ($n=274$), or "healthy" because they neither have a chronic health problem or have selected a chronic and challenging stressor ($n=310$).

There were two healthy samples including college students (sample 1; $n=259$) and healthy adult women (sample 2; $n=51$). The healthy women are similar to other adult women samples with the exception that they had no chronic pain because they served as a control group for a study of women with fibromyalgia. The college students were recruited through the participant pool in the Department of Psychology at the University of New Mexico, Albuquerque, New Mexico. The healthy adult women were recruited through newspaper ads in Albuquerque, New Mexico.

There were two patient samples including women with fibromyalgia (sample 3, $n=32$) and cardiac patients in a cardiac rehabilitation program (sample 4; $n=228$). The women with fibromyalgia were recruited through newspaper ads and through physician's offices in the Albuquerque metropolitan area and all had their diagnoses confirmed by a physician. The cardiac patients were recruited through the New Heart, Inc. cardiac rehabilitation program in Albuquerque, New Mexico. The requirements for participating in the New Heart cardiac rehabilitation program include having had a myocardial infarction (MI), coronary artery bypass surgery (CABG), having a stent installed, having value repair or replacement, or having had a heart transplant.

There were two at-risk samples including first-generation college students (they did not have a parent who had attended any college) in their first year of college (sample 5; $n=151$) and urban firefighters (sample 6; $n=123$). The first-generation college students were all students at the University of New Mexico and were recruited through newspaper ads, the distribution of newsletters on the campus, and the through announcements in classes for first year students. The urban firefighters were members of the Albuquerque Fire Department and were recruited through newspaper ads, the distribution of newsletters to the fire departments, and emails on a listserv of all of the firefighters in the department.

Measures

The Brief Resilience Scale (BRS) and several demographic, personal, and social resources that may be related to the ability to bounce back from stress were assessed by a questionnaire in each of the six samples. Each of these measures is described below.

Resilience

Resilience was assessed using the Brief Resilience Scale (BRS; Smith et al., 2008) which was

designed to capture the original and most basic meaning of resilience as the ability to bounce back or recover from stress (Agnes, 2005). The BRS includes six questions, with an equal number of positive and negatively worded items to reduce the effects of social desirability and positive/negative response bias. The following instructions were used to administer the BRS: "Please indicate the extent to which you agree with each of the following statements by using the following scale; 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree." The items on the BRS are as follows

1. I tend to bounce back quickly after hard times.
2. I have a hard time making it through stressful events (*R*).
3. It does not take me long to recover from a stressful event.
4. It is hard for me to snap back when something bad happens (*R*).
5. I usually come through difficult times with little trouble.
6. I tend to take a long time to get over set-backs in my life (*R*).

R = reverse coded items.

The scores are calculated as the average of responses on all questions after reverse coding items 2, 4, and 6. The Cronbach's alphas for the BRS in samples 1–6 were 0.836, 0.902, 0.877, 0.798, 0.754, and 0.702.

Demographic Resources

The potential demographic resources assessed in all six samples were age, gender, and education. Income was assessed in all of the samples except the two college student samples (samples 1 and 5).

Personal Resources

Active Coping. The active coping subscale of the Brief COPE (Carver, 1997) was used to assess an active approach to coping with stress (e.g., "I take action to try to make the situation better"). The two items were scored on a 4-point scale from 0 = "I do not do this at all" to 3 = "I do this a lot." The active coping subscale was included in all six samples and the Cronbach's alphas for samples 1–6 were 0.621, 0.599, 0.538, 0.723, 0.614, and 0.467, respectively.

Mindfulness. The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) was included in samples 1 and 6. The MAAS included 15 items (e.g., "I feel it difficult to stay focused on what's happening in the present," reverse scored) that were scored on a 6-point scale from 1 = "almost never" to 6 = "almost always." The Cronbach's alpha for the MAAS was 0.865 in sample 1 and 0.913 in sample 6.

Mood Clarity. The mood clarity subscale of the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995) assessed the degree to which participants believe that they are clear about what they are feeling. There are 11 items (e.g., "I am rarely confused about how I feel," reverse coded) were scored on a 5-point scale from 1 = "strongly disagree" to 5 = "strongly agree." The mood clarity subscale was included in samples 1, 2, 3, and 6 and the Cronbach's alphas were 0.833, 0.765, 0.855, and 0.841, respectively.

Optimism. The tendency to have positive expectations about outcomes in the future was assessed by the Life Orientation Test Revised (LOTR; Scheier, Carver, & Bridges, 1994). There are six items ("I'm always optimistic about my future") that were scored on a 5-point scale from 1 = "strongly disagree" to 5 = "strongly agree." The LOTR was assessed in six samples and the Cronbach's alphas for samples 1–6 were 0.759, 0.870, 0.931, 0.787, 0.731, and 0.748, respectively.

Purpose in Life. The purpose in life subscale of the Scales of Psychological Well-Being (Ryff & Keyes, 1995) was included to assess the sense that life has a sense of meaning and purpose. The purpose in life subscale includes items (e.g., "I have a sense of purpose and direction in life") that were scored on a 6-point scale from 1 = "strongly disagree" to 6 = "strongly agree." The 3-item version of the purpose in life subscale was used in sample 4, and the 7-item version was used in samples 1, 2, 3, 5, and 6. The Cronbach's alphas for samples 1–6 were 0.697, 0.870, 0.901, 0.561, 0.814, and 0.641, respectively.

Spirituality. The measure used to assess spirituality included three items to assess religious service

attendance, religious salience, and spiritual salience (Fetzer Institute, 1999). The items were scored on a 6-point scale (e.g., 0–5 range) with response anchors that varied according to the items. The Cronbach's alphas for samples 1–6 were 0.934, 0.981, 0.942, 0.790, 0.807, and 0.753, respectively.

Social Resources

Positive Relations. The positive relations with others subscale of the Scales of Psychological Well-Being (Ryff & Keyes, 1995) was included to assess the sense that life has a sense of meaning and purpose. The purpose in life subscale includes seven items (e.g., "I enjoy personal and mutual conversations with family members or friends") that were scored on a 6-point scale from 1="strongly disagree" to 6="strongly agree." The positive relations subscale was included in samples 1, 5, and 6 and the Cronbach's alphas were 0.705, 0.836, and 0.736, respectively.

Social Support. The Interpersonal Support Evaluation List (ISEL; Cohen et al., 1985) was used for samples 1, 5, and 6 and the MOS Social Support Survey (Sherbourne & Stewart, 1991) was used for the samples 2, 3, and 4. The ISEL has 12 items (e.g., "when I need suggestions on how to deal with personal problems, I know someone I can turn to") and the MOS measure has 20 items (e.g., "someone to turn to for suggestions about how to deal with a personal problem"). Both of the scales were scored on 0–4 scales to facilitate collapsing them for comparison across studies and samples. The Cronbach's alphas for the ISEL in samples 1, 5, and 6 were 0.888, 0.828, and 0.811, respectively. The Cronbach's alphas for the MOS measure in samples 2, 3, and 4 were 0.782, 0.977, and 0.930, respectively.

Statistical Analyses

Independent samples *t*-tests were conducted to examine the differences between the six samples on the measures of resilience and the potential demographic, personal, and social resilience resources. Correlation analyses were used to examine the relationship between resilience and the potential resources for resilience in each of the six samples and in all samples together. Multiple regression analyses were used to examine the relative importance of different resources in predicting resilience in each of the six samples and in all samples together. The alpha used as the cut-off for all statistical tests was $p<0.05$.

Results

Descriptive Statistics and Comparisons of Means

Table 13.1 displays the descriptive statistics for the potential demographic, personal, and social resources for resilience in all six samples and in all of the samples combined. The overall sample of 844 was relatively evenly divided with 48% female. The healthy women and women with fibromyalgia samples were of course all women, the cardiac patients and urban firefighters had a majority of men, and the college student samples had a relatively larger proportion of women. All of the differences in the proportion female were significant except that between general college students and the first-generation college students and that between the healthy women and women with fibromyalgia.

The mean overall age was 37 years with the two college samples with a lower mean age, the cardiac patients with a higher mean age, and the women and urban firefighter samples in the middle. All of the differences between the samples in age were significant. The mean years of education was in the 12–15 years for all samples with the college students having the lowest mean scores. All of the differences were significant except the difference between the women with fibromyalgia and the cardiac patients. The mean incomes were in a similar $60,000–70,000 range for the healthy women, cardiac patients, and urban firefighters and lower at $45,530 for the women with fibromyalgia although none of the differences in income were significant.

The means for the personal resources generally followed the pattern of the healthy women

Table 13.1 Descriptive statistics for the study variables in each of the six samples and all samples combined[a]

	Healthy		Patient		At-risk		
	College students (n=259)	Healthy women (n=51)	Women with fibromyalgia (n=32)	Cardiac patients (n=228)	First generation (n=151)	Urban firefighters (n=123)	All samples (n=844)
Demographic resources							
Female (%)	64	100	100	27	56	7	48
Age (years)	21.08(4.26)	45.01(8.49)	49.99(6.30)	63.91(10.81)	18.42(0.99)	33.61(8.09)	36.60(20.01)
Education (years)	12.29(0.75)	15.33(2.92)	14.69(2.07)	14.73(2.78)	12.00(0.00)	13.29(1.38)	13.29(2.14)
Income ($1,000)	–	65.47(52.96)	45.53(47.57)	64.19(39.68)	–	61.47(11.92)	62.20(37.09)
Personal resources							
Active coping	2.31(0.65)	2.62(0.50)	2.14(0.70)	2.40(0.67)	2.10(0.68)	2.61(0.50)	2.35(0.66)
Optimism	3.65(0.64)	4.14(0.59)	3.36(0.89)	3.89(0.72)	3.64(0.66)	3.97(0.55)	3.78(0.69)
Purpose in life	4.19(0.70)	5.13(0.62)	4.21(1.10)	4.50(0.80)	4.57(0.82)	4.54(0.59)	4.26(0.79)
Spirituality	2.73(1.16)	2.73(1.14)	3.54(1.26)	3.24(1.61)	3.15(1.24)	2.54(1.10)	2.61(1.46)
Mood clarity	3.65(0.56)	3.81(0.46)	3.43(0.67)	–	–	3.86(0.50)	3.71(0.56)
Mindfulness	4.08(0.73)	–	–	–	–	4.39(0.85)	3.97(0.87)
Social resources							
Social support	3.38(0.54)	3.75(0.69)	3.31(0.75)	3.60(0.72)	3.41(0.51)	3.49(0.44)	3.47(0.64)
Positive relations	4.54(0.65)	–	–	–	4.68(0.92)	4.60(0.69)	4.59(0.75)
Resilience	3.56(0.67)	3.93(0.66)	3.18(0.90)	3.87(0.69)	3.54(0.63)	3.95(0.49)	3.70(0.68)

[a]Standard deviations are in parentheses

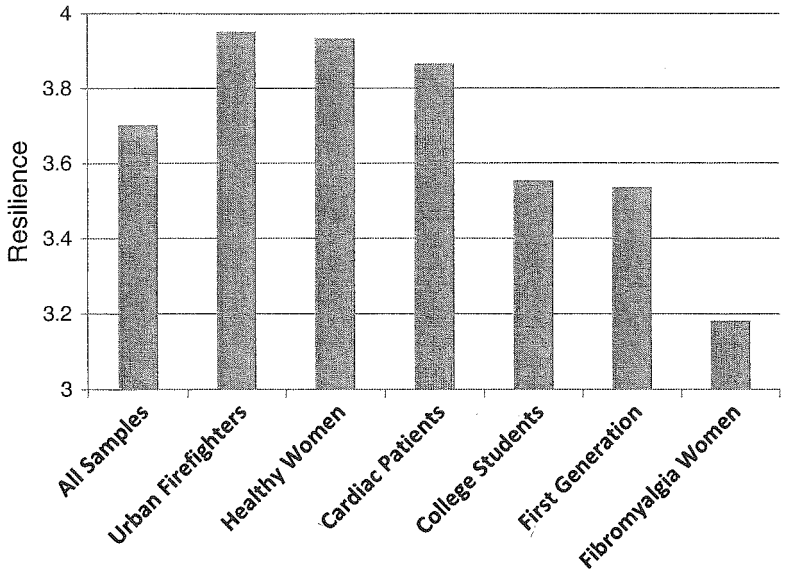

Fig. 13.1 Mean levels of resilience in all six samples and in each individual sample

and urban firefighters being the highest, the cardiac patients, college students and first-generation students being in the middle, and the women with fibromyalgia being the lowest. For active coping, the healthy women and urban firefighters were significantly higher than the general college students and cardiac patients who were significantly higher than the first-generation students and women with fibromyalgia. For optimism, the healthy women, urban firefighters, and cardiac patients were significantly higher than the general college students and first-generation college students, who were significantly higher than the women with fibromyalgia. For purpose in life, the healthy women were significantly higher than the first-generation students, urban firefighters, and cardiac patients who were significantly higher than the general college students and women with fibromyalgia. For spirituality, in contrast, the women with fibromyalgia were significantly higher than the cardiac patients and first-generation students who were significantly higher than the general college students, healthy women, and urban firefighters. For mood clarity, the healthy women and urban firefighters were significantly higher than the general college students who were significantly higher than the women with fibromyalgia. Finally, the urban firefighters were significantly higher on mindfulness than the general college students.

The patterns of significant differences in the social resources measures were similar to that of the personal resource measures for social support but not for the positive relations measure. For the MOS social support measure used with the healthy women, women with fibromyalgia, and cardiac patient samples, the only significant difference was that the healthy women were higher than the women with fibromyalgia. For the ISEL measure used with the general college student, first-generation, and urban firefighter samples, the only significant differences was that the urban firefighters were higher than the general college students. There were no significant differences in mean scores on the positive relations measure between the general college student, first-generation, and urban firefighter samples.

Finally, the mean scores for the BRS are displayed in Table 13.1 as well as in Fig. 13.1 because it is the focus of this chapter. The urban firefighters, healthy women, and cardiac patients were significantly higher than the general college students and first-generation students who were significantly higher than the women with

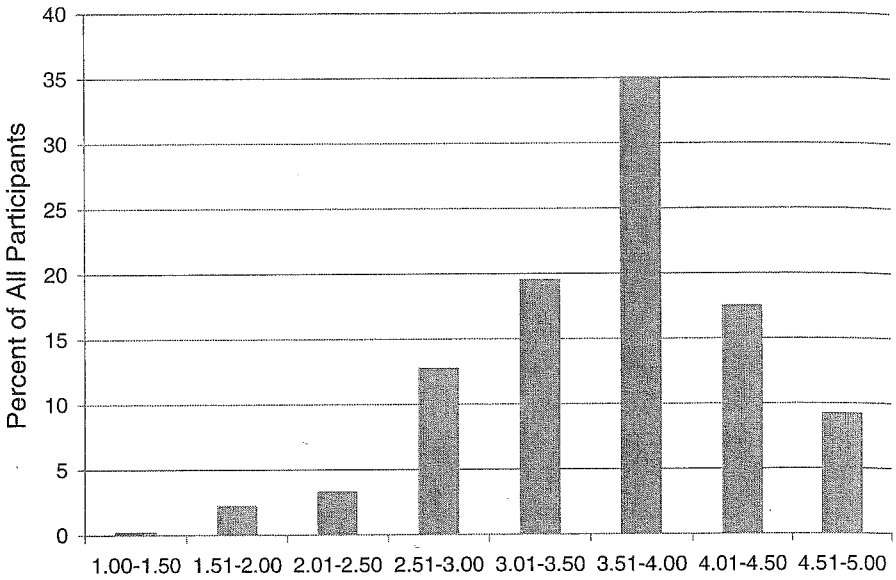

Fig. 13.2 Distribution of scores on the Brief Resilience Scale for all samples combined

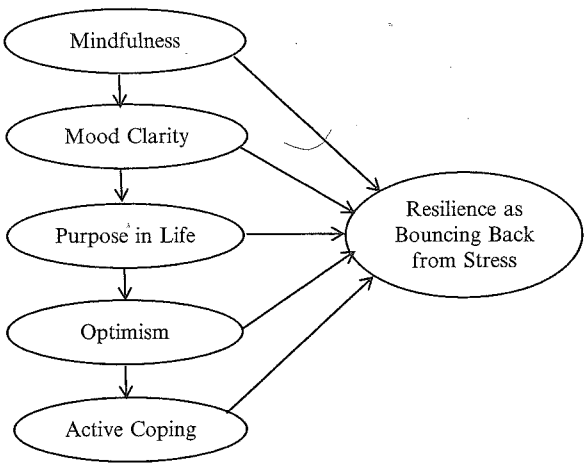

Fig. 13.3 Theoretical model of the effects of personal resources on resilience as bouncing back from stress

fibromyalgia. Thus, the samples can be thought of as being at three tiers regarding the ability to bounce back from stress with the urban firefighters, healthy women, and cardiac patients with a higher range of scores between 3.6 and 3.8, the two college student samples with a middle range of scores between 3.4 and 3.6, and the women with fibromyalgia with a mean score in the lower range with scores between 3.0 and 3.2.

Because this is the first report of the mean scores on the BRS in so many participants in a variety of samples, we present the range of scores in Fig. 13.2. As can be seen when viewing the figure, the distribution is nearly normal with a slight negative skew. Although researchers could select any one of these samples for comparison if they had a similar sample, we combined the samples since they include a range of healthy, patient,

and at-risk participants. Because of the near normal distribution and the wide range of samples and participants, we suggest that the combined sample mean of 3.70 as an overall average resilience score. Because the standard deviation is nearly 0.70 (e.g., 0.68) and it is a conventional for one standard deviation to be a marker for high and low scores on a measure, we also suggest that scores below 3.00 be considered low and scores above 4.30 be considered high in resilience.

Correlations Between Resilience and the Potential Resilience Resources

Table 13.2 displays the zero-order correlations between the BRS and the potential resilience resources in each of the samples and in all of the samples combined. The general convention of describing $r=0.10$ as a small effect, $r=0.30$ as a medium effect, and $r=0.50$ as a large effect will be used in discussing the results. Age, education, and income were not correlated with resilience in any of the samples alone but had small positive relationships with greater resilience in all samples combined. Male gender had a small-to-moderate relationship with greater resilience in the general college student sample and in all of the samples combined.

As for the potential personal resources, all of the six potential personal resources were positive related to resilience when all of the samples were combined. However, there were large differences in the effect sizes and in how much each of these personal resources was related to resilience in each of the individual samples. Optimism and purpose in life were positively related with at least a medium effect size to resilience in all six samples and in all samples combined. Moreover, optimism had a very strong relationship with resilience in both patient samples ($r=0.701$ in the women with fibromyalgia and $r=0.743$ in the cardiac patients) and purpose in life had a very strong relationship with resilience in the women with fibromyalgia ($r=0.734$). Mood clarity had a strong positive relationship with resilience in three of the four samples in which it was assessed including a healthy sample (general college students), a patient sample (women with fibromyalgia), and an at-risk sample (urban firefighters). Mindfulness had a medium positive relationship with resilience in both of the samples (general college student and urban firefighter) in which it was assessed. Active coping had a medium positive relationship with resilience in four of the six samples in which it was assessed and a small or medium positive nonsignificant relationship with resilience in the other two samples. Finally, spirituality had only a small positive relationship with resilience in the cardiac patient sample and was not related to resilience in any of the other samples.

As for the potential social resources, both social support and positive relations had small-to-medium positive relationships with resilience when all of the samples were combined. Social support had small-to-medium positive relationships with resilience in five of the six samples and a small nonsignificant positive relationship with resilience in the healthy women sample. Positive relations had small-to-medium positive significant relationship with resilience in each of the three samples in which it was assessed.

An overall univariate perspective on the relative value of the potential resources might be gained by classifying them based on effect sizes in the analyses using all samples combined. Using this approach, optimism and mood clarity had strong positive relationships with resilience ($r=0.575$ and 0.486, respectively) and mindfulness, active coping, and purpose in life which had medium positive relationships with resilience (*r*s from 0.287 to 0.351), suggesting that these five personal resources may be some of the most important factors for resilience. In addition, male gender, positive relations, social support, age, and education had effects that were all in the small-to-medium sized range (*r*s from 0.162 to 0.231). Finally, income and spirituality had the smallest positive, but significant, relationships with resilience ($r=0.091$ and 0.102, respectively).

Table 13.2 Zero-order correlations between the Brief Resilience Scale and the potential resilience resources in each of the six samples and all samples combined[a]

	Healthy		Patient		At-risk		
	College students ($n=259$)	Healthy women ($n=51$)	Women with fibromyalgia ($n=32$)	Cardiac patients ($n=228$)	First generation ($n=151$)	Urban firefighters ($n=123$)	All samples ($n=844$)
Demographic resources							
Age	0.113^{+}	0.010	−0.123	0.097	−0.018	0.060	0.185**
Male gender	0.260**	–	–	0.099	0.124	0.058	0.231**
Education	0.062	0.269^{+}	−0.044	0.081	–	−0.028	0.162**
Income	–	−0.098	0.321^{+}	0.068	–	0.096	0.102*
Personal resources							
Active coping	0.289**	0.100	0.291	0.357**	0.266**	0.322**	0.341**
Mindfulness	0.328**	–	–	–	–	0.308**	0.351**
Mood clarity	0.466**	0.258^{+}	0.588**	–	–	0.420**	0.486**
Optimism	0.443**	0.358**	0.701**	0.743**	0.458**	0.353**	0.575**
Purpose in life	0.250**	0.440**	0.734**	0.359**	0.270**	0.429**	0.287**
Spirituality	0.056	0.090	0.146	0.132**	0.042	0.084	0.091*
Social resources							
Positive relations	0.197**	–	–	–	0.269**	0.313**	0.230**
Social support	0.171**	0.165	0.411*	0.230**	0.252**	0.367**	0.213**

$^{+}p<0.10$
$^{*}p<0.05$
$^{**}p<0.01$

Multiple Regressions Predicting Resilience in Each of the Individual Samples

Table 13.3 displays the results of the multiple regression analyses predicting the BRS from the potential resilience resources in each of the six samples. In the general college student sample, male gender, active coping, mindfulness, mood clarity, and optimism were all significant predictors of resilience and the full model accounted for 40% of the variance in resilience scores. In the healthy women sample, there were no significant predictors of resilience probably due to the relatively small sample size and large number of predictors. However, there was a trend for purpose in life which had a medium effect in predicting greater resilience and the full model accounted for 30% of the variance. In the women with fibromyalgia sample, purpose in life had a very strong effect in predicting higher resilience and the full model accounted for 68% of the variance. In the cardiac patient sample, optimism had a very strong effect in predicting greater resilience and male gender and active coping also significant predictors of greater resilience with the full model accounting for 59% of the variance. In the first-generation sample, optimism and male gender were again significant predictors of greater resilience with the full model accounting for 26% of the variance. Finally, in the firefighter sample, purpose in life, mood clarity, and active coping had significant effects in predicting greater resilience with the full model accounting for 36% of the variance.

In summary, the potential demographic resources predicted resilience 3 out of the 19 possible times (16%), the potential personal resources predicted resilience 11 out of the 30 possible times (37%), and the potential social resources predicted resilience 0 out of the 9 possible times (0%). The potential resource that predicted resilience the greatest percentage of the time was male gender (75%), followed by optimism, active coping, mood clarity, and mindfulness (50%), and then by purpose in life (33%). Finally, the variance explained by the full model in the patient samples (68 and 59%) was generally higher than the variance explained in the healthy (40 and 30%) and at-risk (26 and 36%) samples. This difference was largely due to the strong effect of the purpose in life on resilience in the women with fibromyalgia and of optimism on resilience in the cardiac patient sample.

Multiple Regressions Predicting Resilience in Different Combinations of the Samples

Although all of the potential resources were not included in all six samples, several of the variables were included in all samples and we combined them to compare their effects with a larger overall sample size. We also examined each of the potential resources that were not included in all of the samples while controlling for the variables that were included in all of the samples. In addition, we created dummy variables to determine whether being in a patient or at-risk sample was related to higher or lower resilience scores. Thus, we created a "patient" variable where participants in samples 1, 2, 5, and 6 were coded "0" and those in the patient samples 3 and 4 (e.g., the women with fibromyalgia and the cardiac patients) were coded "1." Similarly, we created an "at-risk" variable where participants in samples 1, 2, 3, and 4 received a "0" and those in samples 5 and 6 (e.g., the first-generation students and the urban firefighters) were coded "1." Zero-order correlation analyses with the participants from all six samples combined showed that resilience was not related to being in an at-risk sample ($r=0.022$, ns) but had a very small positive relationship with being in a patient sample ($r=0.078$, $p<0.05$).

Table 13.4 displays the results of each of the additional multiple regression analyses that we conducted with various combinations of the samples. The first column in Table 13.4 shows the multiple regression analysis with all of the variables that were included in all six samples. These analyses showed that optimism was a medium-to-strong predictor of greater resilience, while male gender, age, active coping, and purpose in life were small-to-medium predictors of greater

Table 13.4 Multiple regression analyses predicting the Brief Resilience Scale in all samples with selected potential resilience resources as predictor variables

	All samples ($n=844$)	All samples with income ($n=435$)	All samples with mindfulness ($n=381$)	All samples with mood clarity ($n=465$)	All samples with positive relations ($n=532$)
Demographic resources					
Age		0.130*	0.049	0.077	0.055
Male gender	0.205**	0.195**	0.234**	0.236**	0.223**
Education	0.008	−0.029	0.030	0.043	0.011
Income	–	−0.005	–	–	–
Personal resources					
Active coping	0.130**	0.135**	0.169**	0.116**	0.144**
Mindfulness	–	–	0.163**	–	–
Mood clarity	–	–	–	0.257**	–
Optimism	0.449**	0.529**	0.317**	0.257**	0.340**
Purpose in life	0.087*	0.113*	0.036	0.111*	0.105*
Spirituality	−0.002	−0.005	−0.034	0.002	−0.028
Social resources					
Positive relations	–	–	–	–	−0.029
Social support	0.050+	0.048	0.034	−0.003	0.077
Sample type					
Patient	−0.088	−0.072	–	0.099	–
At-risk	−0.025	−0.049	−0.038	−0.058	–
F	15.04**	33.19**	30.10**	25.90**	24.96**
R^2	0.401	0.476	0.423	0.333	0.325

+$p<0.10$
*$p<0.05$
**$p<0.01$

Table 13.3 Multiple regression analyses predicting the Brief Resilience Scale from the potential resilience resources in each of the six samples

	Healthy		Patient		At-risk	
	College students	Healthy women	Women with fibromyalgia	Cardiac patients	First generation	Urban firefighters
Demographic resources						
Age	0.003	0.149	−0.247	0.044	0.042	0.099
Male gender	0.219**	–	–	0.243**	0.188*	0.100
Education	0.075	0.250	−0.047	−0.014	–	−0.134
Income	–	−0.243	0.142	−0.032	–	0.062
Personal resources						
Active coping	0.158**	−0.202	−0.140	0.163**	0.075	0.205*
Mindfulness	0.169**	–	–	–	–	−0.112
Mood clarity	0.278**	0.011	0.248	–	–	0.239*
Optimism	0.289**	0.218	0.138	0.704**	0.361**	0.158
Purpose in life	−0.036	0.336+	0.642**	−0.036	0.107	0.257*
Spirituality	0.015	0.080	0.015	−0.006	−0.007	−0.103
Social resources						
Positive relations	−0.073	–	–	–	0.057	−0.104
Social support	0.019	−0.075	−0.183	0.043	0.040	0.213+
F	15.04**	1.84+	5.15**	31.95**	6.19**	5.03**
R^2	0.401	0.298	0.678	0.589	0.260	0.356

+$p<0.10$
*$p<0.05$
**$p<0.01$

resilience except for social support in which there was a trend. The effect sizes for the correlations were large for optimism and mood clarity, medium for active coping, mindfulness, and purpose in life, and in the small-to-medium range for social support. The effects sizes for the multiple regression analyses were medium-to-large for optimism, medium for mood clarity, small for active coping, purpose in life, and mindfulness, and very small for social support. The findings suggest that optimism and mood clarity are the most important resources for resilience across all samples, while each of the other four resources appear important but less so.

We also found that our secondary hypothesis was confirmed in that age, education, income, spirituality, and positive relations were all correlated with greater resilience when the samples were combined. The correlations were small-to-medium for age and positive relations and small for income and spirituality. However, when controlling for other variables, only age was still significantly related to resilience and the effect size of the other three variables was almost zero. Also, although we made no predictions about gender, we found that male gender had a small-to-medium size zero-order correlation with resilience and a small-to-medium effect in predicting greater resilience when controlling for the other variables. Thus, both age and male gender are demographic factors that may be resources for resilience.

What are the implications of these findings for understanding the foundations of resilience? While the findings for age and male gender are noteworthy, we were most interested in personal and social resources for resilience that can be targeted in interventions. In addition, we particularly wanted to focus on factors that may address the temporal aspects of bouncing back from stress. Although our cross-sectional data cannot provide evidence for the temporal order in our model, we believe that our results general confirm that value of thinking about resilience from a temporal perspective and emphasize the value of mindfulness, mood clarity, active coping, purpose in life, and optimism in our revised model. While we did not want to discount the potentially important role of social resources or spirituality (Cohen & Wills, 1985; Pargament, 1997), we did want to develop a model based the resources that received the strongest empirical support. We suspect that both social relationships and different aspects and forms of spirituality may be involved in each of three stages but that their effects may not be as strong or direct, at least not in the samples that we studied.

Figure 13.1 presents a hypothetical model of the foundations for bouncing back for stress that may be consistent with findings. The arrows pointing from the column of resources displayed on the left side of the model to "resilience as bouncing back from stress" show that mindfulness, mood clarity, purpose in life, optimism, and active coping may all be important personal resources for resilience. The arrows descending vertically from one personal resource to the next are meant show that they may operate in a temporal sequence that general follows this order. Although our findings led us to include these five variables as important predictors of resilience and this order is consistent with our three stage model, the temporal sequence of the five variables presented in this hypothetical model can only be confirmed in additional research that assesses each variable at different time points.

With this in mind, we present our hypothetical model of how these five variables may affect each other in the temporal sequence shown in Fig. 13.1. First, the mindful attention to and awareness of present moment experience may enable a person to confront and fully take in all of the information available during the experience of a stressful event (Brown & Ryan, 2003; Kabat-Zinn, 1990). Second, mood clarity may enable a person to make sense of their emotional experience of the event in a way in which they can best understand how it affects them and what choices they can make about what to do next (Feldman-Barrett et al., 2001; Salovey et al., 1995). Third, purpose in life may help to orient the person (or keep the person oriented) to what is most important to them and provide motivation and direction for coping with the event (Frankl, 1963; Smith & Zautra, 2004). Fourth, optimism may enable the person to envision a positive outcome to the stressful event and help give them the confidence necessary to begin to engage in coping efforts

resilience. The full model accounted for 40% of the total variance in resilience scores. The second column in Table 13.4 shows the results for these same variables with the addition of income which was included in all of the samples except the two college student samples. The results show that optimism was a strong predictor of greater resilience, while male gender, age, active coping, and purpose in life were again small-to-medium predictors of greater resilience. Income was not related to resilience and the full model accounted for 48% of the variance.

The third column in Table 13.4 shows the results for the original variables that were included in all six study plus mindfulness in the two studies in which it was assessed. The results show that optimism was a medium predictor of greater resilience while male gender, active coping, and mindfulness were small-to-medium predictors of greater resilience with the full model accounting for 42% of the variance. Similarly, the fourth column shows the results for the original variables plus mood clarity in the four studies in which it was assessed. Interestingly, the results show that optimism and mood clarity had identical small-to-medium effects in predicting greater resilience, while male gender also had a small-to-medium effect and active coping and purpose in life had small effects with the full model accounting for 33% of the variance. Finally, the fifth column shows the results for the original variables plus positive relations in the three studies in which it appears. The results show that optimism has a medium effect with male gender, active coping, and purpose in life having smaller effects in predicting greater resilience. Positive relations were not related to resilience and the full model accounted for 33% of the variance.

Overall, optimism, active coping, and male gender were consistent predictors of greater resilience across the different combinations of samples. In addition, purpose in life was related to greater resilience in all combinations except the one including mindfulness and mood clarity and mindfulness were related to greater resilience when combining the studies in which they were included and controlling for the variables included in all of the samples. Finally, being in a patient or at-risk sample, education, spirituality, social support, positive relations, and income were not related to resilience in any of the combinations of the samples.

Discussion

The purpose of this chapter was to examine the relationship between resilience as the ability to bounce back from stress and potential demographic, personal, and social resources for resilience. Our primary hypothesis was that the variables selected to assess each of the three aspects of the temporal dimension of resilience would be related to the BRS. These three stages include confronting a stressful event which was assessed by measures of mindfulness and mood clarity (Brown & Ryan, 2003; Feldman-Barrett et al., 2001; Kabat-Zinn, 1990; Salovey et al., 1995), orienting oneself towards a positive future outcome which assessed by measures of optimism and purpose in life (Ryff & Keyes, 1995; Scheier & Carver, 2001; Scheier, Carver, & Bridges, 1994; Smith & Zautra, 2004), and engaging in efforts to cope with the stressor which was assessed be measures of active coping and social support (Carver, 1997; Cohen et al., 1985; Scheier & Carver, 2003; Sherbourne & Stewart, 1991). Our secondary hypothesis was that spirituality, positive relations with others, age, income, and education would be related to greater resilience (Adler et al., 1994; Pargament, 1997). We will first discuss the results in relation to the combined samples and then how the results varied across the individual samples.

Resilience Resources in All Samples Combined

We found that our primary hypothesis was generally confirmed in that each of the six variables that we expected to be involved in the temporal aspects of resilience were correlated with resilience in the overall sample. Even when controlling for the other variables in the combined sample multiple regression analyses, all of these variables were significantly related to greater

(Andersson, 1996; Scheier & Carver, 2003). Fifth, an active approach to coping involves actually engaging in the coping efforts that are may be necessary for bouncing back or recovery from the stressful event (Scheier & Carver, 2003; Smith & Zautra, 2008).

While these findings and this hypothetical model may be generally applicable to a variety of situations, we did want to comment on what we view as the most important differences that we found across samples in the relationship between the resilience resources and resilience; the amount of variance explained by the resilience resources in accounting for BRS score varied across samples, particularly with respect to optimism and purpose in life. The zero-order correlation for the relationship between optimism and resilience was very strong in both the women with fibromyalgia and in the cardiac patients and the correlation between purpose in life and resilience was very strong in the women with fibromyalgia. When controlling for the other variables in the multiple regression analyses, purpose in life was still a strong predictor of greater resilience in the women with fibromyalgia and optimism was still a strong predictor of greater resilience in cardiac patients. It is striking that both of these resources were selected because they were thought to contribute to orienting oneself towards a successful outcome. For patients in cardiac rehabilitation, optimism may be critical for giving a person the confidence for coming to the rehabilitation sessions and believing that it will be beneficial (Scheier et al., 1999). For women with fibromyalgia, a sense of purpose in life may be vital in motivating them to continue to get out of bed and search for ways to reduce the stress of having chronic pain (Smith & Zautra, 2004). Thus, for those facing a health challenge, the ability to orient themselves toward positive future outcomes through optimism and a sense of purpose in life may be particularly valuable.

While the main focus of this chapter was on examining the relationship between resources for resilience and resilience as measured by the BRS, we also presented descriptive data on the BRS in all samples combined and compared the mean of the BRS across individual samples. The fact that the distribution of resilience scores was nearly normal suggests that the measure can be used to identify people who are both high and low in resilience defined as the ability to bounce back from stress. Also, we found intriguing differences in the mean resilience scores across the six samples. The mean scores were generally distributed across three tiers with the urban firefighters, healthy women, and cardiac patients higher in resilience, the general college students and first-generation students in the middle range, and the women with fibromyalgia in the lower range. It is particularly interesting that one patient group (the cardiac patients) was in the higher resilience group, while the other was in the lower resilience group (the women with fibromyalgia). This raises important questions about the variability between chronic illnesses and about whether and how an illness may lead to reduced resilience or be occasions for growing or increasing resilience. It also may be true that lower levels of resilience could be predisposing factors for certain illnesses, especially stress-related disorders (Smith et al., 2010). The other notable finding about group differences in resilience scores is that both college student groups were lower than the urban firefighter, healthy women, and cardiac patient samples. It is possible that this difference could reflect the effects of age and experience, although other differences between the samples and cohort effects could also explain or could confound this interpretation.

Implications for Research and Clinical Work

This research represents an important initial step in examining the relationship between potential resilience resources and the BRS as a specific measure of resilience as the ability to bounce back from stress. A logical next step may be to examine the relationship between the same resilience resources and other measures of resilience to see if there are differences across measures. Another step may be to examine other potential

resources that may appear to be theoretically important for different aspects or processes of resilience as targeted in different measures. Of course a primary limitation of the analyses presented in this chapter is that the data are cross-sectional. While we believe that our theory and data analyses are consistent with the resources we identified as being vital for resilience, longitudinal studies are necessary to provide evidence that the presence of these resources precedes and may truly help to make it possible for a person to bounce back from a stressful event.

A second important limitation of this study is the lack of evidence that the BRS, as a self-report measure of resilience, predicts actual "bouncing back" or recovery as evidenced by independent behavioral and physiological measures. The closest thing to this kind of evidence so far is that the BRS predicted greater habituation to heat and cold pain (Smith et al., 2009). Specifically, higher BRS scores were associated with greater adaptation to thermal pain across five trials when controlling for other personal and social factors such as neuroticism, optimism, and social support. However, there is much additional work that needs to be done to test the predictive validity of the BRS with other kinds of stressors and in relation to other potential markers of recovery from stress. The type of studies that could be most useful are those using the BRS to assess resilience before a stressful event and then determining whether BRS scores are related to improvement on the behavioral and physiological measures that are most initially affected by the stressor.

The research presented in this chapter also may have implications for clinical research and interventions. First of all, one way of further testing whether the resources identified here are important for bouncing back from stress would be to target one or more of these resources in an intervention and determine whether it increases resilience as assessed by the BRS and behavioral and physiological measures. Second, in clinical interventions that are aimed at enabling a person to recover from a stressful event or events, it might be valuable to include both the BRS and the others measures that we found to be most strongly related to it. This could be a way of both disentangling the temporal and causal order of the relationships and determining whether a change in the level of specific resources is associated with a change in resilience itself. Finally, we would suggest that people doing clinical work might pay attention to the three stages that we identified to determine whether they see them as being involved in the process of bouncing back from stress. The careful observation of the client experience and communication of this to clinical researchers would help to better determine whether and how people may use the resources we assessed to confront a stressor, orient to a successful outcome, and how much active coping may be necessarily in recovery from different kinds of stressors.

Conclusions

The purpose of this chapter was to present research to enable us to better understanding the foundations of the human experience of resilience. We were particularly interested in identifying what kind of personal and social resources may be critical to resilience as bouncing back or recovering from stress. We identified potential resilience resources based on a model of resilience that involves three stages of confronting a stressor, orienting to a positive outcome, and actively coping with the stressor. We examined resilience and these resilience resources in six samples including general college students, healthy adult women, women with fibromyalgia, cardiac patients, first-generation college students, and urban firefighters. Our results were consistent with our model in that the personal resources that targeted each of these stages were generally related to the resilience. Overall, we found that mindfulness, mood clarity, purpose in life, optimism, and active coping all appear to be important personal resources for bouncing back from stress as assessed by the BRS. Optimism and mood clarity had the strongest effect sizes across all samples and optimism and purpose in life had the strongest effects in the patient populations.

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