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Onset of Frailty in Older Adults and the Protective Role of Positive Affect

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The aim of this study was to examine the longitudinal association between positive affect and onset of frailty for 1,558 initially nonfrail older Mexican Americans from the Hispanic Established Populations for Epidemiological Studies of the Elderly database. The incidence of frailty increased 7.9% during the 7-year follow-up period. High positive affect was found to significantly lower the risk of frailty. Each unit increase in baseline positive affect score was associated with a 3% decreased risk of frailty after adjusting for relevant risk factors. Findings add to a growing positive psychology literature by showing that positive affect is protective against the functional and physical decline associated with frailty.

Good psychological health, which includes positive affect, is increasingly recognized as having protective benefits against poor health outcomes (Fredrickson, 2003; Fredrickson & Levenson, 1998; Ostir, Leveille, Volpato, Cohen-Mansfield, & Guralnik, 2003; Scheier & Carver, 1992; Segerstrom, Taylor, Kemeny, & Fahey, 1998). Moreover, the protective benefits of positive affect have been shown to be independent of negative affect. That is, positive affect is not simply the absence of negative affect (e.g., depression, worry, anger, anxiety). Bradburn and Caplovitz (1965) were the first to report the relative independence of positive and negative affect—a finding later replicated by other researchers (Baker, Cesa, Gatz, & Mellins, 1992; Diener & Emmons, 1984; Diener, Sandvik, Seidlitz, & Diener 1993; Hilleras, Jorm, Herlitz, & Winblad, 1998; Kunzmann, Little, & Smith, 2000; Ostir, Markides, Black, & Goodwin, 2000). In their original study, Bradburn and Caplovitz found a low correlation between positive and negative items, a high correlation among positive items and among negative items, and that positive and negative items correlated with different external factors. Persons with high positive affect, for example, are more likely to engage in social relationships (Clark & Watson, 1988; Ryff & Singer, 1996), successfully cope with stressful situations (Folkman, 1997; Hilleras et al., 1998), and feel in control of their lives (Hilleras et al., 1998; Ryff & Singer, 1996). Independence between positive and negative affect is also demonstrated by the finding that the neurochemical dopamine is associated with positive feelings, such as warmth and optimism (Hamer, 1996; Panksepp & Miller, 1996), whereas altered serotonin metabolism is associated with negative feelings, such as anxiety, hostility, social phobia, and suicidal thoughts (Depue, Luciana, Arbisi, Collins, & Leon, 1994; Hamer, 1996; Panksepp & Miller, 1996).

Establishing independence between positive and negative affect has important implications for positive psychological research. First, it has stimulated more research on positive psychology, which has served as a counterpoint to a focus on depression and other negative psychological states. Second, it has led to the development of new positive psychological theories (i.e., broaden-and-build theory) and the testing of those theories (Fredrickson, 2003). Third, it allows us to begin to address the question of what good positive emotions are (Fredrickson & Levenson, 1998).

Emerging evidence from large epidemiological studies indicates that positive affect can decrease the risk of acute medical events. For example, in a large sample of older community-dwelling Caucasians and African Americans, high positive affect was significantly associated with a reduced risk of incident stroke during a 6-year period (Ostir, Markides, Peek, & Goodwin, 2001) and incident myocardial infarction during a 4-year period (Ostir, Peek, Markides, & Goodwin, 2001), after adjustments were made for relevant risk factors, including negative affect. Similarly, older Mexican Americans who reported high positive affect at baseline interview had a significantly reduced risk of incident disability, mobility problems, and mortality 2 years later, adjusting for relevant risk factors, including negative affect (Ostir et al., 2000).

Knowing a person's level of positive affect prior to an acute medical event is also a good predictor of recovery of functional ability after the event (Ostir et al., 2002). In a community-based study of older Caucasians and African Americans, high positive affect measured 1 year prior to stroke, myocardial infarction, or hip fracture was a significant independent predictor of recovery in activities of daily living (ADLs) 1 year after the acute event (Ostir et al., 2002). Mossey, Mutran, Knott, and Craik (1989) found hip fracture patients who reported positive affect were three times more likely than depressed patients to achieve independence in walking, nine times more likely to return to prefracture levels of physical functioning, and nine times more likely to reach the highest quartile of overall physical function. HIV patients with high positive affect have demonstrated slower immune decline, later symptom onset, and longer survival times (Reed, Kemeny, Taylor, & Visscher, 1999; Reed, Kemeny, Taylor, Wang, & Visscher, 1994).

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An unanswered question is whether positive affect is associated with the development of frailty in the older person. The term *frailty* has been used clinically as a global concept to describe a condition, common in the very old, of impaired strength, endurance, and balance; vulnerability to trauma and other stressors; and a high risk for morbidity, disability, and mortality. Between 10% and 25% of persons aged 65 years and older are identified as frail, with the proportion increasing dramatically with increasing age (Hamerman, 1999). The "American Medical Association White Paper on Elderly Health" (1990) stated, "After the age of 85, 46 percent of those living in the community fall into this group of frail elderly" (p. 2460).

The percentage of persons identified as frail depends on the definition and criteria used to define frailty. Brown, Renwick, and Raphael (1995) defined frailty as "diminished ability to carry out the important practical and social activities of daily living" (p. 95). Frailty is also described as "excess demand posed upon reduced capacity" (Powell, 1997, p. 24), a "condition in individuals lacking strength" (Buchner & Wagner, 1992, p. 1), or a state that puts the person "at risk for adverse health outcomes" (Hamerman, 1999, p. 945). Frailty also has been described in biological terms, where over time, the body's ability to cope with stressors decreases, resulting in declines in multiple physiological domains and increased risk for adverse health outcomes (Binder et al., 2002).

Bortz (2002) concluded that more research is needed on frailty, as frailty is not inevitable and is reversible by active intervention strategies. An association between positive affect and frailty would add to emerging studies of resistance to adverse health outcomes and may target new areas for intervention studies. As psychologists begin to identify and understand linkages between positive psychological factors (including positive affect) and better health outcomes, this understanding may reshape the way people think about disease and recovery processes. For example, understanding the role of positive affect in rehabilitation programs has the implication to better understand how patients cope with their medical event (e.g., stroke) and how interactions between positive affect and selective coping strategies—including positive reappraisals and problem-focused coping—may impact future quality of life (Folkman, 1997). In addition, understanding positive affect's role in maintaining good health may allow insights into why some individuals who belong to underserved or disadvantaged groups are more resilient or resistant to poor health outcomes. Extensive documentation on ethnic disparities in health outcomes points to the generality that belonging to an underserved ethnic group increases a person's risk for poor health outcomes; however, considerable variability means that not all persons within these underserved groups have poor health—some show health profiles similar to or better than Whites (Eschbach, Ostir, Patel, Markides, & Goodwin, in press; Ostir et al., 2003).

In this study, we used data from the Hispanic Established Populations for Epidemiological Studies of the Elderly (H-EPESE) to address two questions: What is the cumulative risk of frailty in the older Mexican American population? and Does positive affect protect against the risk of frailty? To address these two questions, we used a modified version of an operationally defined phenotype of frailty developed by Fried et al. (2001) in an older, mostly White population.

Evidence suggests that the syndrome of frailty may differ for older Mexican Americans compared with older non-Hispanic White Americans. Mexican Americans report lower socioeconomic status, have reduced access to health and social services, and have a higher prevalence of diabetes, obesity, infectious–parasitic diseases, influenza–pneumonia, and tuberculosis than non-Hispanic White adults (Markides et al., 1999). Mexican Americans are more likely to refuse recommended treatment (Sedlis et al., 1997), adhere poorly to treatment regimes, and delay seeking care (Mitchell & McCormack, 1997). A recent Institute of Medicine report suggests that "these behaviors and attitudes can develop as a result of a poor cultural match between minority patients and their providers, mistrust, misunderstanding, lack of knowledge, or language barriers" (Smedley, Stith, & Nelson, 2002, p. 7). The Robert Wood Johnson Foundation (2001) found that one in five Spanish-speaking Hispanics do not seek medical care because of language barriers. We hypothesized that the cumulative risk of frailty using operationally defined criteria will increase during 7 years of follow-up and that increasing levels of positive affect will have an inverse association with the development of frailty over the follow-up period.

Method

Sample

Data were obtained from the H-EPESE, an ongoing population-based study of noninstitutionalized Mexican Americans aged 65 years or older (Markides, Rudkin, Angel, & Espino, 1997). Subjects were selected from the five southwestern states of Texas, California, Arizona, Colorado, and New Mexico. The sample design was for a multistage area probability cluster sample that involved selection of counties, census tracts, and households. In the first stage, counties (a small census-based geographical area) were selected if at least 6.6% of the county population was of Mexican American ethnicity. In the second stage, census tracts were selected with a probability proportional to the size of their older (age 65+ years) Mexican American population, using counts from the 1990 U.S. census. In the third stage, census blocks (small area units within census tracts) were selected at random to obtain at least 400 households within each census tract. These households were screened to identify persons who were older Mexican Americans. The sampling procedure assures a sample that is generalizable to the approximately 500,000 older Mexican Americans living in the Southwest. The five states in the H-EPESE sampling frame contain 85% of the 65 and older Mexican American population living in the United States.

The response rate at baseline (1993–1994) was 83% (Markides et al., 1997). In-home interviews were conducted in Spanish or English at the baseline interview and at each of the three follow-up interviews 2, 5, and 7 years later. Of the original 3,050 subjects initially enrolled in the study, 901 died and 465 were lost to follow-up (i.e., refused or moved). For the remaining 1,684 subjects reinterviewed at each of the three follow-up interviews, 1,558 were categorized as nonfrail and 126 (7.5%) were classified as frail at the baseline interview.

Measures

Frailty. Frailty was assessed at each of the three follow-up interviews (2, 5, and 7 years postbaseline interview) according to a modified version of the Fried and Walston Frailty Scale (Fried & Walston, 1998). The modified scale has a range of 0 to 4 and includes weight loss, exhaustion, walking speed, and grip strength. Weight loss was calculated as the difference between weight at the previous interview and current weight. Subjects with unintentional weight loss (i.e., not the result of diet or exercise) of $>$ 10 lbs. (4.54 kg) were categorized as positive for the weight criterion (score = 1). Exhaustion was assessed using two items from the

Center for Epidemiologic Studies—Depression (CES–D; Radloff, 1977) scale: "I felt that everything I did was an effort" and "I could not get going." The items asked "How often in the last week did you feel this way?" and subjects responded on a 4-point scale: 0 = *rarely or none of the time (< 1 day)*, 1 = *some or a little of the time (1–2 days)*, 2 = *a moderate amount of the time (3–4 days)*, or 3 = *most of the time (5–7 days)*. Subjects answering 2 or 3 to either of these two items were categorized as positive for the exhaustion criterion (score = 1). Walking speed was assessed over an 8-ft. (2.44-m) walk. Subjects unable to perform the walk or who recorded walking speeds of ≥ 9 s (≥ 75th percentile) were categorized as positive for the short-walk criterion (score = 1). Grip strength was assessed by different criteria for men and women. Men and women unable to perform the grip strength test and who registered a grip strength of 21 kg or less (≤ 25th percentile) for men and a grip strength of 14 kg or less (≤ 25th percentile) for women were categorized as positive for the grip strength criterion (score = 1). Subjects who scored < 3 on the summary Frailty Scale were categorized as nonfrail (score = 0), and those who scored ≥ 3 were categorized as frail (score = 1). The Frailty Scale has shown good predictive validity among older (≥ 65 years of age) Caucasian and African American men and women. The scale was predictive of incident outcomes including falls, worsening mobility or ADL function, hospitalization, and death (Fried et al., 2001).

Positive affect. A four-item positive affect summary scale was created (from the CES–D scale) on the basis of previously established criteria. Researchers, using factor analysis techniques, have consistently found four items to load onto a single Positive Affect factor (Miller, Markides, & Black, 1997; Radloff, 1997; Roberts, 1980; Sheehan, Fifield, Reisine, & Tennen, 1995). The four positive items include the following: "I felt that I was just as good as other people," "I felt hopeful about the future," "I was happy," and "I enjoyed life" (Radloff, 1977).

The positive items, assessed at baseline interview and at each of the three in-person follow-up interviews, asked "How often in the last week did you feel this way?" Responses to the four positive items were scored on a 4-point scale: 0 = *rarely or none of the time (< 1 day)*, 1 = *some or a little of the time (1–2 days)*, 2 = *a moderate amount of the time (3–4 days)*, or 3 = *most of the time (5–7 days)*. Summing the responses from the four items created a positive affect summary scale with a potential range of 0 to 12, where higher scores indicate higher positive affect. The four positive affect items have shown high internal consistency ($\alpha = .80$) and a weak correlation ($r = -.26$) with the remaining 16 negative items from the CES–D (Ostir et al., 2000). Correlation analysis also showed a weak association with the two exhaustion items ("I felt that everything I did was an effort" and "I could not get going") included in the Frailty Scale ($\alpha = -0.14$).

Sociodemographic factors and medical conditions. Sociodemographic factors included age, gender, marital status, and years of schooling completed. Age was used as a continuous variable (≥ 65 years). Marital status at baseline interview and at each follow-up interview was coded as married, single (never married), separated, divorced, or widowed and was recoded into two categories: currently married and unmarried. Years of schooling completed was used as a continuous variable. At baseline interview, subjects were asked whether they ever had a physician diagnosis of heart attack, stroke, cancer, hip fracture, or diabetes. The number of prevalent medical conditions was summed with a potential range of 0 to 5. At each of the three follow-up interviews, subjects were asked whether they had a physician diagnosis of heart attack, stroke, cancer, hip fracture, or diabetes since the last interview. The number of new onset medical conditions was summed separately for each follow-up interview.

Statistical Analysis

Nonfrail subjects at baseline were followed for up to 7 years for evidence of frailty (score of ≥ 3 on a summary Frailty Scale). Chi-square analysis assessed the cumulative number of subjects and percentage who developed frailty over the follow-up period using the individual components of the Frailty Scale and the total scale. Cox proportional hazard models using PROC PHREG were used to estimate the hazard ratios (HRs) of frailty over 7 years of follow-up. Three Cox proportional hazard models were computed. The first model examined univariate (unadjusted) associations for baseline positive affect, age, gender, marital status, years of schooling completed, and medical conditions in relation to frailty at follow-up. The second model examined the multivariate association between positive affect at baseline and frailty at follow-up, adjusting for age, gender, marital status, years of schooling completed, and medical conditions. Because number of medical conditions, marital status, and positive affect may have changed during the follow-up period, a third model added these variables as time-dependent covariates. All analyses were performed using SAS statistical software (SAS Institute, Inc., 2000).

Results

At baseline interview, the mean age of the sample ($N = 1,558$) was 71.9 years ($SD = 5.70$), with a range of 65 to 94 years; 61.4% were women. The mean years of schooling completed was 4.9 years ($SD = 3.89$), with a range of 0 to 20; 57.8% were married. Most reported no medical condition (70.7%), with 5.7% reporting two or more medical conditions. The positive affect summary scale ranged from 0 to 12, with a mean of 8.6 ($SD = 3.47$).

Table 1 presents the cumulative number and percentage of subjects categorized as frail at the 2-, 5-, and 7-year follow-up interviews. During the 7-year follow-up period, the percentage of individuals classified as frail increased from 3.6% at the 2-year follow-up to 7.9% at the 7-year follow-up ($p = .01$). The cumulative number and percentage of each of the four individual components of the Frailty Scale also increased during the follow-up period. The percentage of subjects who lost 10 lbs. (4.54 kg) or more increased from 13% at the 2-year follow-up to 20.1% at the 7-year follow-up, whereas the percentage of those feeling exhausted increased from 11.3% to 17.5%. Those unable to walk 8 ft. (2.44 m) in less than 9 s increased from 24.6% at the 2-year follow-up to 30.8% at the 7-year follow-up ($p = .01$). The percentage of subjects unable to exceed the grip strength threshold of > 21 kg (for men) and > 14 kg (for women) increased from

Table 1
Frequency and Percentages of Subjects Categorized as Frail During Follow-up (N = 1,558)

	Follow-up period (year)					
	2		5		7	
Frailty components	*n*	%	*n*	%	*n*	%
Lost > 10 lb (4.54 kg)	203	13.0	269	17.3	313	20.1
Exhaustion (yes)	177	11.3	260	16.7	272	17.5
Walking speed (≥ 9 s)	383	24.6	465	29.9	480	30.8
Grip strength (kg)[a]	375	24.1	516	33.1	537	34.5
Frailty summary score (≥ 3)	54	3.6	100	6.6	120	7.9

Note. All subjects were nonfrail at baseline interview. Subjects with ≥ 3 frailty components were classified as frail.
[a] Test of grip strength was calculated separately for men and women. Men who scored < 21 and women who scored < 14 (≤ 25th percentile) were classified as positive for the test of grip strength.

24.1% at the 2-year follow-up to 34.5% at the 7-year follow-up ($p = .01$).

Table 2 presents associations for baseline factors, including positive affect and risk of frailty, during the 7-year follow-up period. Results are presented in terms of HRs and 95% confidence intervals (CIs), with and without adjustment for relevant risk factors. The second column shows unadjusted associations for each baseline factor (positive affect, age, gender, marital status, years of schooling, and medical conditions) and frailty. Baseline factors significantly associated ($p < .05$) with frailty during the follow-up period included positive affect, age, female, and unmarried. For example, for each unit increase in the positive affect score, the HR of being classified as frail decreased by 3% (HR = 0.97; 95% CI = 0.95, 0.99; $p = .01$). The third column shows the fully adjusted model of frailty. The model indicates that the strength of association between positive affect and frailty with adjustments for baseline risk factors was similar to the unadjusted model (HR = 0.97; 95% CI = 0.96, 0.99; $p = .01$). Other factors that remained significantly associated with frailty in the fully adjusted model were age and female. Two interactions were also tested: Positive Affect × Gender and Positive Affect × Age. Both interactions were nonsignificant.

Table 3 presents a multivariate model that includes both baseline variables and three time-dependent variables: medical conditions, marital status, and positive affect. Two time-dependent variables (medical conditions and positive affect) were significantly associated with frailty. Each unit increase in positive affect score, for example, was associated with a 7% decreased HR of being classified as frail (HR = 0.93; 95% CI = 0.91, 0.96; $p = .01$), and increasing number of medical conditions was associated with a 19% increased HR of being classified as frail (HR = 1.19; 95% CI = 1.03, 1.38; $p = .02$). Baseline variables that remained significantly associated with frailty with the addition of the time-dependent covariates included positive affect, age, and female.

Table 3
Hazard Ratios (HRs) of Frailty Over 7 Years of Follow-up for Baseline Characteristics and Time-Dependent Covariates (N = 1,558)

	Frailty		
Variable	HR	95% CI	*p*
Baseline characteristic			
Positive emotion (0–12)	0.97	0.95–0.98	.01
Age (65–94 years)	1.02	1.00–1.03	.01
Female (vs. male)	1.27	1.11–1.46	.01
Unmarried (vs. married)	1.26	0.95–1.66	.11
Years of schooling (0–20)	1.00	0.98–1.02	.97
Medical conditions (0–5)	1.05	0.95–1.16	.35
Time-dependent covariates			
Positive emotion (0–12)	0.93	0.91–0.96	.01
Medical conditions (0–5)	1.19	1.03–1.38	.02
Unmarried (vs. married)	0.83	0.63–1.09	.17

Note. CI = confidence interval.

Discussion

This study provides information on the syndrome of frailty and the role of positive affect for community-dwelling older Mexican Americans living in the southwestern United States. The study had two goals: first to examine the trajectory of frailty over 2, 5, and 7 years for initially nonfrail older Mexican Americans and second to examine whether positive affect would reduce the incident risk of frailty during this time period. Our results can be summarized as follows. The cumulative percentage of initially nonfrail Mexican American men and women classified as frail after 7 years was 7.9%. Many of these older Mexican American men and women were classified as impaired in walking speed (30.8%) and grip strength (34.5%); fewer were classified as impaired in weight loss (20.1%) and exhaustion (17.5%).

The study also showed that even though the risk of being classified as frail increased during the follow-up period, this risk was significantly reduced by increasing positive affect score at baseline interview. That is, as positive affect scores at baseline increased, the associated risk of frailty decreased. Other factors significantly associated with frailty at baseline included increasing age and female gender. In addition, two time-dependent covari-

Table 2
Hazard Ratios (HRs) of Frailty Over 7 Years of Follow-up for Baseline Characteristics of Sample (N = 1,558)

	Frailty					
	Unadjusted[a]			Adjusted		
Baseline characteristic	HR	95% CI	*p*	HR	95% CI	*p*
Positive emotion (0–12)	0.97	0.95–0.99	.0001	0.97	0.96–0.99	.01
Age (65–94 years)	1.01	1.00–1.02	.02	1.01	1.00–1.02	.05
Female (vs. male)	1.23	1.09–1.38	.0006	1.19	1.04–1.35	.01
Unmarried (vs. married)	1.16	1.03–1.30	.01	1.06	0.94–1.20	.36
Years of schooling (0–20)	0.99	0.98–1.01	.21	1.00	0.98–1.01	.67
Medical conditions (0–5)	1.04	0.95–1.15	.72	1.04	0.95–1.45	.41

Note. All subjects were nonfrail at baseline interview. CI = confidence interval.
[a] Bivariate association with frailty.

ates—positive affect and medical conditions—were significantly associated with frailty.

Fried et al. (2001), using data from the Cardiovascular Health Study, examined the incidence of frailty for older Caucasians and African Americans. The incidence of frailty over a 4-year period was reported as 7.2% for all subjects (of which 85% were Caucasian) and 11% for African Americans alone. Though the Cardiovascular Health Study is not directly comparable with the current study because of differences in assessment times and variation of the Frailty Scale (i.e., our frailty scale did not include the activity level component), the results nonetheless suggest that the rate of incident frailty for older Mexican Americans is less than that for older African Americans and similar to that of older Caucasians (i.e., the incidence of frailty over a 5-year period for older Mexican Americans was 6.4%). The percentage of persons classified as frail in the current study and in the Cardiovascular Health Study, however, is likely an underestimation, as both studies excluded those with missing data or lost to follow-up (e.g., refused to be reinterviewed or died).

Despite the generally low socioeconomic standing of the Mexican American population, research has consistently indicated a similar or better health profile compared with non-Hispanic White Americans (Hayes-Bautista, Baezconde-Garanati, & Hayes-Bautista, 1994; Markides & Coreil, 1986; Vega & Amara, 1994). For example, Mexican Americans display lower mortality rates from several of the leading causes of death, including cardiovascular diseases and cancer, when compared with non-Hispanic White Americans (Sorlie, Backlund, Johnson, & Rogot, 1993). Moreover, the Mexican American advantage in mortality becomes progressively larger with advancing age (Preston & Elo, 1996). One possible explanation is that differences in experiences and responses to stress create a health advantage for Mexican Americans. This hypothesis is concordant with a growing literature that identifies multiple mechanisms by which stress becomes embodied in poorer physical health (Folkman & Moskowitz, 2004). A number of studies have reported that Mexican Americans have lower prevalence of affective disorders compared with non-Hispanic White Americans (Burnam et al., 1987; Moscicki, Locke, Rae, & Boyd, 1989; Vega et al., 1998). Our own research with older Mexican Americans suggests that positive affect predicts a number of beneficial health outcomes, including greater functional independence and mobility and survival (Ostir et al., 2000).

Other researchers examining associations between positive psychological factors and risk for adverse health outcomes have reported similar findings. Danner, Snowdon, and Friesen (2001), using data from the Nun study, reported that nuns who expressed the most positive emotions in their autobiographies lived up to 10 years longer than nuns who expressed fewer positive emotions. Fredrickson and Levenson (1998) found that positive emotions can reverse or undo the effects negative emotions or stress can have on the development of cardiovascular disease.

These and other studies have helped shift the research focus away from one exclusively examining associations between negative psychological factors and health toward associations between positive psychological factors and health. Research is also beginning to test hypotheses on how positive psychological factors may be linked to better health and well-being. Fredrickson (2003) has presented evidence showing that positive emotions indirectly affect health by increasing a person's intellectual (i.e., creativity, the ability to learn new information, and memory), physical (increased strength and coordination), psychological (e.g., optimism), and social resources. Numerous studies have found that the building and maintaining of social resources that includes relationships with others or the community at large is associated with better mental health, less disease and disability, and increased survival (Berkman, 1995; House, Landis, & Umberson, 1988; Ostir et al., 2003; Seeman, 1996).

Positive affect also may directly affect health via chemical and neural responses involved in maintaining homeostatic balance (Damasio, 2001). More than a decade ago, Melnechuk (1988) reviewed information showing positive affect modulated immune function. Cohen et al. (1999) found that an optimistic attitude moderated the association between acute stress and immune function. Segerstrom et al. (1998) presented evidence showing optimists had increased numbers of helper T cells and higher natural killer cell cytotoxicity in response to a stressful event.

The current study has some limitations. First, the database did not have information on activity level. Consequently, our frailty scale ranged from 0 to 4 rather than from 0 to 5, as in the original scale; consequently, our results may underestimate the number of subjects classified as frail. Second, our measure of positive affect is relatively crude. Because the positive affect summary scale encompasses such overlapping concepts as happiness, optimism, autonomy, and esteem, one could argue that it would not be well represented by a four-item scale. In contrast, this scale was a relatively robust, independent predictor of incident frailty, which validates its ability to discriminate within a population. The third limitation is the use of self-reported medical conditions. A number of studies, however, have found high agreement between self-reported medical conditions and those verified by chart review or physician interview (Psaty et al., 1995). Finally, our analysis only considered the pathway from nonfrail to frail. We did not consider transitions in frailty (i.e., from frail to nonfrail). Studies are needed to examine these transitions and the role positive psychological factors may play in promoting recovery. Our study also has several strengths, including its large community-based sample, its prospective design, 7 years of follow-up, and use of an operationally defined measure of frailty. In addition, this study was the first to our knowledge to examine frailty and the protective role of positive affect in the largest minority population in the United States (Day, 1996).

Overall, the number of persons aged 65 years or older is expected to increase from approximately 35 million in 2000 to an estimated 71 million in 2030 (U.S. Census Bureau, n.d.), and the number of persons aged 80 years or older is expected to more than double, increasing from 9.3 million in 2000 to 19.5 million in 2030 (U.S. Census Bureau, n.d.). Within this context, the number of Hispanic older adults (of which approximately 60% self-identify as Mexican American) is also expected to grow over the next 2 decades. By the year 2020, the Hispanic older population will grow by 76%, compared with a growth rate of 38% for non-Hispanic White older adults and 34% for African American older adults (Day, 1996). The rapid growth in the number and proportion of older persons in the United States has raised important quality-of-life issues. For example, increased life expectancy indicates, in part, the success of public health programs (Kinsella & Velkoff, 2001), but these same programs must now address the challenges created by this achievement. One way is to better understand the

role that positive psychological factors can play in maintaining physical and mental health and quality of life. Bowling (1997) stated that "the concept of positive health is more than the mere absence of disease or disability and implies 'completeness' and 'full functioning' or 'efficacy' of mind and body and social adjustment" (p. 5). As we begin to identify and better understand direct and indirect linkages between positive psychological factors and health outcomes, this understanding may reshape the way we think about disease and recovery processes. Understanding how positive psychological states interact with coping processes in older age (Folkman, 1997), for example, may prove beneficial for intervention studies or rehabilitation programs, in which the aim is revising and reassessing goals and outcomes in relation to health and well-being while providing continued meaning and purpose to life.

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