Journal of Personality and Social Psychology
1998, Vol. 74, No. 3, 763–773

0022-3514/98/$3.00

The Sense of Control as a Moderator of Social Class Differences in Health and Well-Being

Margie E. Lachman and Suzanne L. Weaver
Brandeis University

The authors examined social class differences in 2 aspects of the sense of control (mastery and perceived constraints) in 3 national probability samples of men and women ages 25–75 years (N_1 = 1,014; N_2 = 1,195; N_3 = 3,485). Participants with lower income had lower perceived mastery and higher perceived constraints, as well as poorer health. Results of hierarchical multiple regression analyses showed that for all income groups, higher perceived mastery and lower perceived constraints were related to better health, greater life satisfaction, and lower depressive symptoms. However, control beliefs played a moderating role; participants in the lowest income group with a high sense of control showed levels of health and well-being comparable with the higher income groups. The results provided some evidence that psychosocial variables such as sense of control may be useful in understanding social class differences in health.

There is an extensive body of research linking sense of control with both physical and psychological health (Rodin, 1986). Believing that one has control over outcomes is associated with better reported health, fewer and less severe symptoms, faster recovery from illness, and greater longevity (Lachman, 1986; Rodin, Timko, & Harris, 1985). Given the robust findings of social class differences in health, there has been an interest in identifying psychosocial variables such as sense of control that are related to health and may contribute to understanding the social class health gradient (Adler et al., 1994; Marmot et al., 1991). The goal of the present study was to examine whether the sense of control would moderate the relationship between social class and health.

Is a Sense of Control Always Beneficial?

Although most of the research linking health and control has been correlational, a few experimental studies have also shown that increasing the sense of control is adaptive for health (e.g., Langer & Rodin, 1976). There have been, however, some contradictory findings suggesting that in some circumstances high levels of control may be damaging for health-related outcomes (Thompson, Cheek, & Graham, 1988). For example, a strong need for control has been associated with a Type A behavior pattern (Strickland, 1978). Because Type A personalities are heavily invested in controlling their lives, they may place themselves at greater risk for coronary heart disease. There is also evidence that having control may be a disadvantage if it is ultimately removed. For example, when residents of a nursing home were given control of the timing of visits from student volunteers, the effects were initially positive (Schulz, 1976). However, when the volunteers stopped coming, it was the group that had been given the most control initially that suffered the most debilitating consequences (Schulz & Hanusa, 1978).

A strong belief in control may also be detrimental in stressful circumstances. Those with views of the world as controllable and predictable may be particularly vulnerable when faced with an uncontrollable event, such as widowhood (Wortman, Sheedy, Gluhoski, & Kessler, 1992). Widows who had the highest sense of mastery and control had a more difficult time coping with the loss of their spouse than those with a lower sense of control (Wortman et al., 1992). This may be because those with a high sense of control would be more likely to blame themselves for the death. Or, in some cases, the realization that events are not completely controllable can be upsetting to those whose worldview fosters a strong belief in control.

There has also been some discussion about whether a sense of control is adaptive for those in disadvantaged economic circumstances. One point of view holds that it is not adaptive for people who are economically disadvantaged to believe they are in control because it is unrealistic and may lead to unwarranted self-blame for their circumstances (Newman, in press). Given uncertain financial futures and fewer opportunities for advancement, it may be more advantageous for economically disadvantaged individuals to maintain a realistic assessment of their circumstances (Newman, personal communication, October 19, 1995; in press). If conditions for lower income groups do not afford the opportunities for taking control, it is possible that having a high sense of control would lead to disappointment and frustration (Thompson et al., 1988). Poor people do, in fact, face tremendous external obstacles that affect their well-being. Thus, it is possible that accurate perception of the external constraints and determinants of one's opportunities may be more

Margie E. Lachman and Suzanne L. Weaver, Department of Psychology, Brandeis University.

This research was supported by the John D. and Catherine T. MacArthur Foundation Research Network on Successful Midlife Development. We appreciate the helpful discussions and feedback from network members.

Correspondence concerning this article should be addressed to Margie E. Lachman, Department of Psychology, Brandeis University, P.O. Box 9110, Waltham, Massachusetts 02254-9110. Electronic mail may be sent to lachman@binah.cc.brandeis.edu.

effective for those in the lower social classes (G. Gurin & Gurin, 1970).

Another point of view suggests that the illusion of control is beneficial (Langer, 1975; Taylor, 1989). The sense of control is assumed to have adaptive value even in the face of adversity because it provides the motivation to work hard to change one's plight in contrast to a sense of apathy or hopelessness (Seligman, 1975, 1991). Because it is difficult to assess the veridicality of control beliefs outside of the laboratory, the amount of control one has in any given situation is subject to different interpretations. There is reason to believe that it is adaptive for those with fewer opportunities to believe in themselves and in their ability to control aspects of their lives. Control in most everyday situations is not absolute, and outcomes are probabilistic. If individuals believe they have some degree of control, they may be more likely to take action even though there is no guarantee they will be successful. One goal of this study was to examine whether control beliefs play a similar adaptive role for health and well-being for different social class groups.

Social Class Differences in the Sense of Control

There is consistent evidence that lower class groups have higher morbidity and mortality rates (Adler et al., 1994; Marmot et al., 1991). There has been an interest in examining the role of psychosocial variables such as control beliefs in the socioeconomic status (SES)–health gradient (Adler et al., 1994). Given that the sense of control is related to health, it is also useful to consider the consistent findings on variations in the sense of control by SES. Those in lower income groups or those with less education have a lower sense of control, are more likely to believe in the role of fate or powerful others, and are less likely to believe in their own efficacy (Gurin & Brim, 1984; G. Gurin & Gurin, 1970; P. Gurin, Gurin, & Morrison, 1978; Lachman, 1985; Levenson, 1981).

What are the sources and consequences of such social class differences in personal control? It is possible that part of what is learned in higher education and in higher paying jobs is that there is a relationship between one's actions and outcomes—an experience not readily available to the disadvantaged. Another possibility is that these lower control beliefs reflect the reality of the lower income living situation. Those with higher income and more education do have more opportunities, they may be more effective, and they are treated differently in many situations. Individuals at lower income levels may have fewer opportunities to influence the events that affect their lives compared with people at higher levels. This lack of control could then affect quality of education, occupation, housing environment, nutrition, and health-related behaviors, all of which are likely to have health-damaging consequences.

Lower income groups show lower levels of control beliefs, on average, than higher income groups. However, there are likely to be individual differences within groups. Thus, there may be individuals in lower income groups who do have a high sense of control. These individual differences within groups may tell us something about the processes linking control and health. Individuals from lower income groups who maintain a high sense of control were expected to have better health and well-being than their low-income counterparts with a low sense of control. If the sense of control plays an adaptive, buffering role, then those in the lower income groups who have a high sense of control should show levels of health and well-being similar to those in the higher income groups.

The goal of the present study was to examine *social class differences* (defined as household income or economic status) in two aspects of control: beliefs about mastery and perceived external constraints. Further, we were interested in the relationship between control beliefs and self-reported health (physical and psychological). We examined whether control beliefs are equally adaptive for all levels of economic status and whether they moderate the relationship between SES and health.

Method

Surveys

To enable replication and extension of the results, three national data sets, collected by the John D. and Catherine T. MacArthur Foundation Network on Successful Midlife Development in 1993, 1994, and 1995, were analyzed for this research. The first two surveys were preliminary studies designed to develop and test instruments for the Midlife Development Inventory to be used in a large-scale survey of midlife development (Study 3). The final version of the instrument, used in Study 3 (Midlife in the United States, MIDUS), included a more comprehensive assessment of health (reports of symptoms and functional limitations in addition to self-rated health) and a more complete measure of control beliefs. All three surveys were based on national probability samples of noninstitutionalized, English-speaking adults from households in the continental United States that included at least one telephone and were selected with random digit dialing procedures. An adult from each household was selected randomly and interviewed for approximately 30 min by telephone. For Studies 2 and 3, mail questionnaires were also sent.[1] For Studies 1 and 2, minimal refusal conversion procedures were undertaken; that is, only two follow-up phone calls were made, and one letter was sent (if necessary, for questionnaire return in Study 2). In the main survey, Study 3, a more extensive refusal conversion procedure, consisting of phone calls, letters, and incentives, was implemented to maximize the response rate.

In Study 1, the response rate was 55%. The total sample size was 1,195 and included 51% men and 49% women. Age of respondents ranged from 19 to 87, with an average age of 44.31 years (SD = 15.85). Just over half of the sample (57%) were married, and the majority (83%) were Caucasian. More than one third of the sample (39%) had graduated from high school, 32% had some college education, and 29% had a college degree. The primary goal of this study was to examine health, well-being, and community involvement.

Study 2, designed to study psychological processes and health, was conducted with 1,014 men (53%) and women (47%) with an average age of 48.08 years (SD = 11.70, range = 30–70). The response rate was 60%. Follow-up questionnaires were mailed to the respondents, and 574 were completed. Of the total sample, 68% were married, 91% were Caucasian, 39% were high school graduates, and about half of the sample had some college (32%) or a college degree (29%).

Study 3 (MIDUS), conducted to examine factors associated with psychological and physical health, had a response rate of 67%. The

[1] Compared with the Current Population Survey data (Bureau of Labor Statistics, 1994), our samples were positively biased in terms of social class. Our samples underrepresented minorities and those with low income and education. This is likely due to the data collection methods used (i.e., telephone surveys and lengthy self-report questionnaires).

telephone sample included 3,485 respondents. Ages ranged from 25 to 75 years old ($M = 47.05$, $SD = 13.10$). Fifty-one percent of the sample were men. The majority of the sample was Caucasian (88%), and over half were married (63%). Of the total sample, 11% had less than a high school diploma, 29% had completed high school or a general equivalency diploma, 31% had completed some college, and 29% had attained a baccalaureate or advanced degree. Questionnaires were returned by 3,032 respondents (87%).

Measures

Psychological Well-Being Measures

Depressive symptoms. In Study 1, depressive symptoms were measured with six items. Respondents indicated how often during the past 30 days they felt worn out, physically exhausted, full of energy, emotionally exhausted, full of life, and tired on a 4-point scale (1 = *all of the time,* 4 = *none of the time*). The negatively worded items were reverse scored, and the mean score across the items was computed for respondents who had valid responses on at least three items. Higher scores indicate greater depressive symptoms.

In Studies 2 and 3, depressive symptoms were also measured with six items. Respondents indicated how often during the past 30 days they felt each symptom on a 5-point scale (1 = *all of the time,* 5 = *none of the time*). The items included the following: so sad that nothing could cheer you up, nervous, restless or fidgety, hopeless, that everything was an effort, and worthless. Items were reverse scored, and the mean across the items was computed for respondents who had valid responses on at least three items. Higher scores indicate greater depressive symptoms.

Estimates of internal consistency of the depressive symptoms scales were acceptable in all three studies (coefficient αs = .78 in Study 1, .78 in Study 2, and .87 in Study 3).

Life satisfaction. In all three studies, respondents rated their overall life at the present time on a 10-point scale (1 = *worst possible life you can imagine,* 10 = *best possible life you can imagine*).

Health Measures

Self-rated health. In Studies 1 and 3, respondents rated their present state of health on a 10-point scale (1 = *worst possible state of health,* 10 = *best possible state of health*). In Study 2, respondents rated their health on a 5-point scale (1 = *poor,* 5 = *excellent*).

Functional limitations. In Study 3, respondents rated on a 4-point scale (1 = *a lot,* 4 = *not at all*) how much their health limited them in doing each of nine activities (e.g., lifting or carrying groceries; bending, kneeling, or stooping; and walking more than a mile). Items were recoded on a 4-point scale (0 = *not at all,* 3 = *a lot*) and summed so that higher scores indicated more limitations. The possible range of scores was from 0 to 27.

Chronic health problems. In Study 3, respondents rated whether or not they had experienced or been treated for 29 health problems in the past 12 months (e.g., asthma, thyroid disease, migraine headaches, ulcer, hay fever, and stroke). A total scale score was computed based on the number of chronic health problems respondents endorsed. The scores could range from 0 to 29, with higher scores reflecting a greater number of chronic health problems.

Acute health symptoms. In Study 3, respondents rated how often they experienced each of nine physical symptoms during the past 30 days (e.g., lower backaches, trouble getting to sleep or staying asleep, and sweating a lot) on a 6-point scale (1 = *almost every day,* 6 = *not at all*). Items were recoded on a 6-point scale (0 = *not at all,* 5 = *almost everyday*) and then summed, such that scores could range from 0 to 45. Higher scores reflect more severe acute health symptoms.

The Sense of Control

In all three studies, the sense of control was operationalized with two dimensions: personal mastery and perceived constraints. *Personal mastery* refers to one's sense of efficacy or effectiveness in carrying out goals. *Perceived constraints* indicates to what extent one believes there are obstacles or factors beyond one's control that interfere with reaching goals. These dimensions are consistent with Skinner's (1996) two-fold conceptualization of control as comprised of competence and contingency. Some researchers have advocated the use of domain-specific measures of control to maximize the likelihood of finding relationships in a given domain (e.g., Bandura, 1997; Lachman, 1986), however, because there were multiple domains in the study (health and psychological well-being), the use of generalized control measures was deemed more appropriate. Moreover, if the relationships with health and well-being were found by using the generalized measures, this would be even more compelling than with domain-specific measures.

In Studies 1 and 2, it was necessary to use a very short measure of control to meet the criteria for inclusion in the 30-min telephone interview, which contained many other variables. In the main survey (Study 3), we were able to include a larger number of items because the control items were included in a mail-back questionnaire. Studies 1 and 2 included three items from Pearlin and Schooler's (1978) Mastery Scale and several new items developed to measure these constructs. Study 3 includes all seven items from Pearlin and Schooler's Mastery Scale, plus five additional items. Principal-axis factor analysis using varimax rotation was performed on the items, and two factors were extracted in each study (i.e., two eigenvalues were greater than one). Table 1 shows the factor loadings and item-to-total correlations for these scales and indicates which items were from Pearlin and Schooler's Mastery Scale.

Personal mastery. In Study 1, two items measured personal mastery: "I can do just about anything I really set my mind to," and "When I really want to do something, I usually find a way to succeed at it." Study 2 measured mastery using the same items as Study 1, but added a third item: "Whether or not I am able to get what I want is in my own hands." Study 3 added a fourth item: "What happens to me in the future mostly depends on me." Respondents indicated the extent to which each of those statements described them using a 4-point scale in Study 1 (1 = *a lot,* 4 = *not at all/never*), a 5-point scale in Study 2 (1 = *agree/yes strongly,* 5 = *disagree/no strongly*), and a 7-point scale in Study 3 (1 = *strongly agree,* 7 = *strongly disagree*). Items were reverse scored, and the mean of the items was computed for respondents who had valid items for at least half of the items on the mastery scale. Higher scores reflect greater personal mastery. Estimates of internal consistency (coefficient αs) of the mastery scales were .59 in Study 1, .53 in Study 2, and .70 in Study 3.

Perceived constraints. In Study 1, perceived constraints was measured using four items on a 4-point scale (1 = *a lot,* 4 = *not at all/never*). The items were as follows: "Other people determine most of what I can and cannot do," "There is little I can do to change many of the important things in my life," "I often feel helpless in dealing with the problems of life," and "What happens in my life is often beyond my control." In addition to these four items, Study 2 included a fifth item: "There are many things that interfere with what I want to do." In Study 2, responses were made on a 5-point scale (1 = *agree/yes strongly,* 5 = *disagree/no strongly*). Study 3 included all of the items from Studies 1 and 2, as well as three additional items: "I have little control over the things that happen to me," "There is really no way I can solve all the problems I have," and "I sometimes feel I am being pushed around in my life." In Study 3, responses were made on a 7-point scale (1 = *strongly agree,* 7 = *strongly disagree*). In all three studies, items were reverse scored and the mean of the items was computed for respondents who had valid responses on at least half of the items on the constraints scale. Higher scores reflect greater perceived

Table 1
Factor Loadings and Item-to-Total Correlations for the Sense of Control Scales in Studies 1, 2, and 3

Item	Mastery			Constraints			Item to total		
	1	2	3	1	2	3	1	2	3
Mastery items									
Can do anything[a]	.68	.65	.73	−.11	−.14	−.13	.42	.39	.54
Find a way	.60	.55	.60	−.12	−.11	−.13	.42	.37	.46
In my own hands		.39	.51		−.26	−.22		.33	.47
Future depends on me[a]			.48			−.20			.46
Perceived constraints items									
Little I can do[a]	−.05	−.15	−.20	.47	.48	.57	.35	.39	.55
Feel helpless[a]	−.12	−.20	−.22	.61	.51	.68	.44	.43	.66
Other people determine	−.17	−.18	−.16	.52	.46	.62	.39	.38	.59
Beyond my control	−.06	−.10	−.21	.47	.61	.67	.36	.46	.63
Things interfere		−.08	−.09		.39	.54		.31	.50
Little control[a]			−.23			.70			.67
No way to solve[a]			−.24			.66			.64
Feel pushed around[a]			−.16			.61			.58

[a] Item from Pearlin and Schooler (1978).

constraints. Estimates of internal consistency of the perceived constraints scales were acceptable (coefficient αs = .60 in Study 1, .64 in Study 2, and .86 in Study 3). Note that for Studies 1 and 2, control items were worded in the third person rather than in the first person.

Income

In Studies 1 and 2, household income was reported on a 7-point scale. In Study 3, respondents indicated which of 36 income categories represented their own personal earnings income, their spouse's or partner's income, their income from Social Security retirement benefits, their income from government assistance programs, and their income from all other sources. A composite total household income score was then computed based on these five income sources. For consistency with Studies 1 and 2, we recoded the composite total household income in Study 3 to the 7-point scale used in the other studies. The categories were as follows: 1 = *less than $10,000*, 2 = *$10,000 to $14,999*, 3 = *$15,000 to $19,999*, 4 = *$20,000 to $24,999*, 5 = *$25,000 to $34,999*, 6 = *$35,000 to $49,999*, and 7 = *$50,000 or more*. The income distributions for the three samples are presented in Table 2.

Results

Descriptive Analyses

The means, standard deviations, and zero-order correlations for the demographic variables, income, mastery, perceived constraints, and the outcome variables are shown in Tables 3 and 4. As expected, income as well as mastery and perceived constraints were related to psychological well-being and self-reported health. Those with higher incomes, greater sense of mastery, and lower perceived constraints had lower depressive symptoms, higher life satisfaction, and better self-assessments of health.[2]

Table 2
Frequency Distributions for Income in Studies 1, 2, and 3

Income category	Study 1		Study 2		Study 3	
	N	%	*N*	%	*N*	%
1. $0–$9,999	109	9.7	39	4.1	208	6.9
2. $10,000–$14,999	116	10.3	60	6.3	146	4.8
3. $15,000–$19,999	106	9.4	80	8.4	181	6.0
4. $20,000–$24,999	109	9.7	93	9.7	210	6.9
5. $25,000–$34,999	178	15.8	152	15.9	448	14.8
6. $35,000–$49,999	216	19.2	204	21.3	608	20.1
7. $50,000 or higher	292	25.9	330	34.4	1231	40.6

Income and the Sense of Control

The first analysis examined whether there were differences in mastery and perceived constraints by income. One-way analyses of variance (ANOVAs) were conducted for mastery and perceived constraints using a three-group split on income categories (low income = 1–4, medium income = 5–6, high income = 7). There were significant differences in all analyses: Study 1 mastery, $F(2, 1122) = 3.73$, $p < .02$, and perceived constraints, $F(2, 1097) = 22.79$, $p < .0001$; Study 2 mastery, $F(2, 949) = 12.12$, $p < .0001$, and perceived constraints, $F(2, 938) = 41.82$, $p < .0001$; and Study 3 mastery, $F(2, 2997) = 8.81$, $p < .001$, and perceived constraints, $F(2, 2997) = 81.22$, $p < .001$. As expected, those with higher income levels were higher in mastery and lower in perceived constraints (see Table 5). It is also important to note that there is overlap in the distributions across income groups, and there is comparable variability within income groups. This indicates, for example, that there are some individuals in the low-income group with high mastery and low perceived constraints and some in the high-income group with low mastery and high perceived constraints.

[2] All results presented are based on unweighted data. We used Current Population Survey data (Bureau of Labor Statistics, 1994) to develop weights in Study 3 to correct for sampling bias. When the weights were applied, the results of all analyses in Study 3 remained the same.

Table 3
Means, Standard Deviations, and Correlations for All Variables in Study 1 (Above Diagonal) and Study 2 (Below Diagonal)

Variable	Study 1		Study 2											
	M	*SD*	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Age	44.31	15.85	48.08	11.70	—	.07*	−.12***	−.10***	−.03	−.16***	.12***	−.04	.05	−.25***
2. Sex[a]	1.49	0.50	1.47	0.50	.19***	—	.05	.14***	−.18***	−.04	.00	.13***	.03	.00
3. Race[b]	1.17	0.38	1.09	0.28	−.08*	.01	—	−.14***	−.11***	.04	.05	−.02	−.00	.03
4. Marital status[c]	1.43	0.50	1.32	0.47	.07*	.12***	.10***	—	−.41***	.03	.02	.12***	−.22**	−.10***
5. Income	4.73	2.03	5.29	1.78	−.23***	−.19***	−.15***	−.37***	—	.09**	−.21***	−.20***	.23***	.21***
6. Mastery	3.59	0.51	4.30	0.74	−.13***	−.04	−.06	.01	.16***	—	−.21***	−.19***	.20***	.21***
7. Constraints	2.22	0.63	2.47	0.91	.22***	.07*	.05	.04	−.31***	−.34***	—	.24***	−.23***	−.19***
8. Depressive symptoms	2.19	0.52	1.80	0.62	−.06	.02	.05	.08**	−.27***	−.25***	.39***	—	−.35***	−.41***
9. Life satisfaction	7.62	1.60	7.81	1.73	.05	−.01	−.06	−.18***	.18***	.20***	−.28***	−.42***	—	.36***
10. Self-rated health	7.84	1.74	3.48	1.00	−.17***	−.01	−.09**	.03	.29***	.19***	−.27***	−.27***	.28***	—

[a] Sex: 1 = men; 2 = women. [b] Race: 1 = White; 2 = non-White. [c] Marital status: 1 = married; 2 = unmarried.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
Means, Standard Deviations, and Correlations for All Variables in Study 3

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Age	47.05	13.09	—												
2. Sex[a]	1.51	0.50	.04*	—											
3. Race[b]	1.12	0.32	−.10***	.02	—										
4. Marital status[c]	1.38	0.48	−.05**	.13***	.10***	—									
5. Income	5.41	1.87	−.04*	−.17***	−.12***	−.42***	—								
6. Mastery	5.84	1.02	−.07***	−.10***	.03	−.01	.08***	—							
7. Constraints	2.74	1.29	.09***	.09***	.03	.05**	−.25***	−.40***	—						
8. Depressive symptoms	1.57	0.64	−.11***	.11***	.03	.10***	−.18***	−.27***	.48***	—					
9. Life satisfaction	7.65	1.67	.15***	−.03	−.02	−.19***	.18***	.30***	−.40***	−.47***	—				
10. Self-rated health	7.35	1.66	−.02	−.01	.02	−.04*	.14***	.22***	−.29***	−.36***	.38***	—			
11. Functional limitations	4.71	6.54	.27***	.14***	.05**	.08***	−.24***	−.15***	.30***	.29***	−.21***	−.46***	—		
12. Chronic problems	2.60	2.86	.18***	.13***	−.01	.06***	−.14***	−.16***	.30***	.42***	−.21***	−.40***	.41***	—	
13. Acute symptoms	9.49	7.53	.03	.16***	−.05**	.01	−.14***	−.18***	.36***	.54***	−.27***	−.40***	.41***	.54***	—

[a] Sex: 1 = men; 2 = women. [b] Race: 1 = White; 2 = non-White. [c] Marital status: 1 = married; 2 = unmarried.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5
Mean Mastery and Perceived Constraints Scores for Studies 1, 2, and 3 (by Income Group)

	Study 1 income group			Study 2 income group			Study 3 income group		
Variable	Low	Medium	High	Low	Medium	High	Low	Medium	High
Mastery									
M	3.55_a	3.62_{ab}	3.64_b	4.14_a	4.31_b	4.44_b	5.70_a	5.86_b	5.90_b
SD	0.56	0.46	0.45	0.85	0.71	0.64	1.12	0.98	0.99
Range	1–4	2–4	2–4	1–5	1.33–5	2–5	1–7	1–7	1.25–7
Constraints									
M	2.36_a	2.18_b	2.05_c	2.83_a	2.45_b	2.18_c	3.20_a	2.73_b	2.46_c
SD	0.66	0.58	0.58	0.91	0.92	0.76	1.41	1.24	1.17
Range	1–4	1–4	1–3.75	1–5	1–5	1–4	1–7	1–7	1–6.5

Note. Ratings were made on a 4-point scale in Study 1 and on a 5-point scale in Studies 2 and 3. Within each study, means in the same row with different subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison.

Relationship Between Sense of Control and Psychological Well-Being

The next set of analyses examined whether mastery and perceived constraints are related to health and well-being, controlling for demographic variables. Further, we tested a model of whether the relationships between mastery–perceived constraints and health varied by income group (i.e., interaction effects).

Hierarchical regression analyses were used to examine the variables predicting respondents' depressive symptoms, life satisfaction, and health in the three studies. We tested whether the interactions of income with mastery and perceived constraints accounted for a significant amount of variance above and beyond their main effects alone, after controlling for sociodemographic characteristics. We entered variables in blocks into the regression equation, computed the incremental *F* test of the difference in R^2 between the blocks of variables, and examined whether there was a significant change in the total R^2 after each new set of predictors was added to the model (Cohen & Cohen, 1983). In each study, the order of entry was as follows. At Step 1, the demographic characteristics (race, sex, age, and marital status) were entered into the model. At Step 2, income was entered. At Step 3, the main effects of mastery and perceived constraints were entered. At Step 4, the interactions of Income × Mastery and Income × Perceived Constraints were added. In all three studies, scores for income, mastery, and perceived constraints were centered by subtracting the mean. This procedure reduces problems of multicollinearity among predictor variables when computing interaction terms (Jaccard, Turrisi, & Wan, 1990).

Table 6
Summary of Hierarchical Regression Analyses for Variables Predicting Depressive Symptoms in Studies 1 (N = 1,089), 2 (N = 917), and 3 (N = 2,889)

	Study 1			Total	Study 2			Total	Study 3			Total
Variable	B	*SE* B	β	R^2	B	*SE* B	β	R^2	B	*SE* B	β	R^2
Step 1				.03				.01				.03
Race[a]	−0.10	.04	−.07**		−0.02	.06	−.01		−0.01	.03	−.01	
Sex[b]	0.09	.03	.09**		0.01	.04	.01		0.06	.02	.05**	
Age	−0.00	.00	−.11***		−0.01	.00	−.19***		−0.01	.00	−.16***	
Marital status[c]	0.06	.03	.06		0.01	.04	.01		0.06	.02	.04**	
Step 2				.05				.08				.05
Income	−0.03	.01	−.10**		−0.05	.01	−.15***		−0.01	.01	−.03*	
Step 3				.12				.23				.27
Mastery	−0.14	.03	−.14***		−0.13	.03	−.15***		−0.05	.01	−.08***	
Constraints	0.16	.02	.20***		0.22	.02	.33***		0.22	.01	.44***	
Step 4				.12				.24				.27
Income × Mastery	0.03	.01	.07*		0.00	.01	.01		0.02	.01	.05**	
Income × Constraints	0.01	.01	.03		−0.04	.01	−.10**		0.00	.00	.01	

Note. For Study 1, $R^2 = .03$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .07$ for Step 3; $\Delta R^2 = .004$ for Step 4 ($ps < .001$ for Steps 1, 2, and 3; *ns* for Step 4). For Study 2, $R^2 = .01$ for Step 1; $\Delta R^2 = .07$ for Step 2; $\Delta R^2 = .15$ for Step 3; $\Delta R^2 = .01$ for Step 4 ($ps < .01$ for Steps 1 and 4; $ps < .001$ for Steps 2 and 3). For Study 3, $R^2 = .03$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .22$ for Step 3; $\Delta R^2 = .002$ for Step 4 ($ps < .001$ for Steps 1, 2, and 3; $p < .01$ for Step 4).
[a] Race: 1 = White; 2 = non-White. [b] Sex: 1 = men; 2 = women. [c] Marital status: 1 = married; 2 = unmarried.
* $p < .05$. ** $p < .01$. *** $p < .001$.

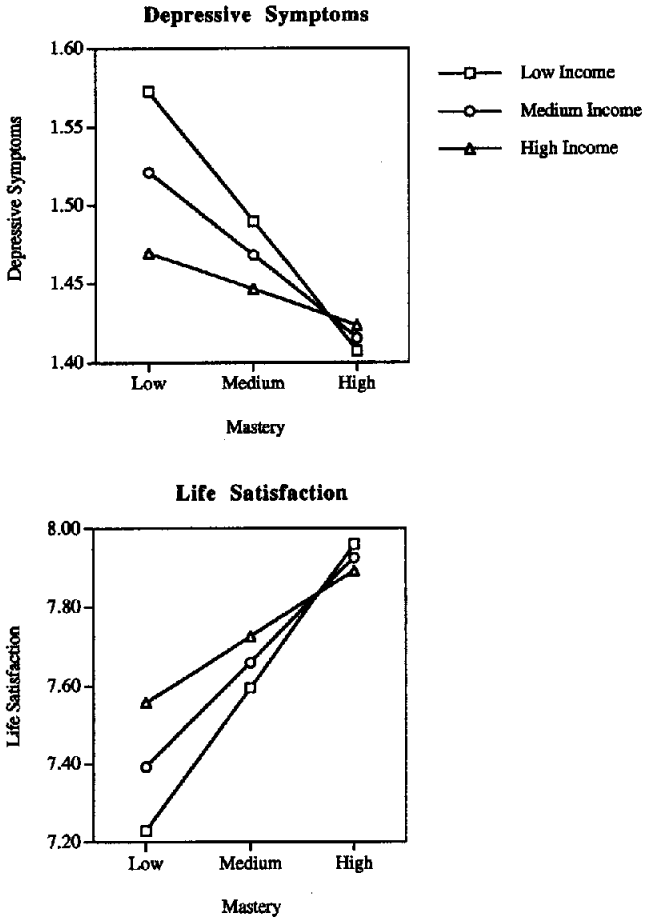

Figure 1. Predicted regression lines for psychological well-being in Study 3.

Depressive Symptoms

Table 6 presents the results of the regressions on depressive symptoms in Studies 1, 2, and 3. In all three studies, depressive symptoms were higher for younger respondents. Depressive symptoms were also higher for women in Studies 1 and 3, for Caucasians in Study 1, and for unmarried respondents in Study 3. At the second step, income was negatively associated with depressive symptoms.

At Step 3, mastery and perceived constraints were both significant predictors of depressive symptoms. Lower mastery and higher perceived constraints were associated with greater depressive symptoms.

At Step 4, there were significant interactions in all three studies. Figure 1 depicts the predicted regression lines for the significant interaction found in Study 3. In Studies 1 and 3, at all income levels, having higher mastery was associated with lower depressive symptoms scores. Additionally, the level of depressive symptoms among lower income participants with high mastery was similar to the level of depressive symptoms among higher income groups.

In Study 2, there was a significant Income × Perceived Constraints interaction. Respondents with low perceived constraints showed similarly low levels of depressive symptoms at different income levels; however, high perceived constraints was associated with the greatest depressive symptoms among low-income respondents.

Life Satisfaction

The results of the regressions on life satisfaction are shown in Table 7. In all three studies, respondents who were older and those who were married reported greater life satisfaction. Also, in Studies 1 and 3, women reported greater life satisfaction. In Studies 1 and 3, income was positively related to life satisfaction. In Study 2, income was not a significant predictor of life satisfaction in the final model. Mastery and perceived constraints were also significant predictors of life satisfaction. Those with higher mastery and lower perceived constraints were more satisfied with their lives.

In Studies 1 and 2, there was a significant Income × Perceived Constraints interaction, and in Study 3, there was a significant Income × Mastery interaction. In Studies 1 and 2, low-income respondents with lower perceived constraints reported being as satisfied as higher income respondents in Studies 1 and 2. Figure 1 shows the predicted regression lines for Study 3. Differences in life satisfaction as a function of income were evident among the low-mastery respondents, but not among the high-mastery respondents.

Relationship Between Sense of Control and Health

Self-Rated Health

Table 8 shows the results of the regressions on self-rated health. In Studies 1 and 2, younger respondents reported better health. In Study 1, women and married respondents reported better health. In Study 2, Caucasians and nonmarried respondents reported better health. None of the demographic characteristics were significant predictors of self-rated health in Study 3. Income was a significant positive predictor of health in all three studies. High mastery and low perceived constraints were associated with better self-rated health. The Mastery × Income interaction reached significance in Studies 1 and 3. For Study 3, the significant Income × Mastery interaction, shown by the predicted regression lines in Figure 2, reveals that lower income respondents with high mastery reported similar levels of health as higher income respondents. The same pattern was found for Study 1.

Functional Limitations

Table 9 shows the results of the regressions on the objective health measures in Study 3 (functional limitations, chronic problems, and acute symptoms). Non-Caucasians, women, and older adults reported greater functional limitations. At Step 2, income was negatively associated with functional limitations. At Step 3, perceived constraints was positively related to functional limitations, but mastery was not. At Step 4, there was a significant Income × Constraints interaction. As shown in Figure 2, income differences in functional limitations were attenuated by lower perceived constraints.

Table 7
Summary of Hierarchical Regression Analyses for Variables Predicting Life Satisfaction in Studies 1 (N = 1,089), 2 (N = 917), and 3 (N = 2,885)

Variable	Study 1 B	*SE* B	β	Total R^2	Study 2 B	*SE* B	β	Total R^2	Study 3 B	*SE* B	β	Total R^2
Step 1				.05				.03				.06
Race[a]	0.19	.11	.05		0.01	.19	.00		0.11	.09	.02	
Sex[b]	0.33	.09	.11**		0.00	.11	.00		0.14	.05	.04**	
Age	0.01	.00	.09**		0.02	.00	.11***		0.02	.002	.18***	
Marital status[c]	−0.54	.10	−.17***		−0.56	.12	−.15***		−0.55	.06	−.16***	
Step 2				.08				.05				.07
Income	0.09	.02	.11***		0.04	.04	.04		0.03	.02	.04*	
Step 3				.14				.13				.25
Mastery	0.47	.09	.15***		0.34	.08	.14***		0.26	.03	.16***	
Constraints	−0.38	.07	−.16***		−0.43	.07	−.22***		−0.45	.02	−.34***	
Step 4				.15				.14				.25
Income × Mastery	−0.02	.04	−.01		0.04	.04	.03		−0.05	.01	−.07***	
Income × Constraints	0.11	.03	.09**		0.10	.04	.09**		−0.02	.01	−.03	

Note. For Study 1, $R^2 = .05$ for Step 1; $\Delta R^2 = .03$ for Step 2; $\Delta R^2 = .06$ for Step 3; $\Delta R^2 = .01$ for Step 4 (*ps* < .05). For Study 2, $R^2 = .03$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .08$ for Step 3; $\Delta R^2 = .01$ for Step 4 (*ps* < .001 for Steps 1, 2, and 3; $p < .05$ for Step 4). For Study 3, $R^2 = .06$ for Step 1; $\Delta R^2 = .01$ for Step 2; $\Delta R^2 = .18$ for Step 3; $\Delta R^2 = .004$ for Step 4 (*ps* < .001).
[a] Race: 1 = White; 2 = non-White. [b] Sex: 1 = men; 2 = women. [c] Marital status: 1 = married; 2 = unmarried.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 8
Summary of Hierarchical Regression Analyses for Variables Predicting Self-Rated Health in Studies 1 (N = 1,087), 2 (N = 916), and 3 (N = 2,886)

Variable	Study 1 B	*SE* B	β	Total R^2	Study 2 B	*SE* B	β	Total R^2	Study 3 B	*SE* B	β	Total R^2
Step 1				.08				.03				.002
Race[a]	0.13	.13	.03		−0.22	.11	−.06*		0.18	.09	.03	
Sex[b]	0.27	.10	.08**		0.12	.06	.06		0.09	.06	.03	
Age	−0.02	.00	−.21***		−0.01	.00	−.07*		0.002	.002	.02	
Marital status[c]	−0.30	.11	−.09**		0.13	.07	.07*		−0.02	.07	−.006	
Step 2				.11				.09				.02
Income	0.14	.03	.16***		0.12	.02	.21***		0.08	.02	.09***	
Step 3				.15				.13				.10
Mastery	0.46	.10	.13***		0.13	.05	.10**		0.21	.03	.13***	
Constraints	−0.26	.08	−.09**		−0.17	.04	−.16***		−0.28	.03	−.21***	
Step 4				.16				.13				.11
Income × Mastery	−0.13	.05	−.09**		0.00	.02	.01		−0.04	.02	−.05**	
Income × Constraints	0.01	.04	.01		0.00	.02	.00		0.005	.01	.008	

Note. For Study 1, $R^2 = .08$ for Step 1; $\Delta R^2 = .03$ for Step 2; $\Delta R^2 = .04$ for Step 3; $\Delta R^2 = .007$ for Step 4 (*ps* < .05). For Study 2, $R^2 = .03$ for Step 1; $\Delta R^2 = .06$ for Step 2; $\Delta R^2 = .04$ for Step 3; $\Delta R^2 = .00$ for Step 4 (*ps* < .001 for Steps 1, 2, and 3; *ns* for Step 4). For Study 3, $R^2 = .002$ for Step 1; $\Delta R^2 = .02$ for Step 2; $\Delta R^2 = .08$ for Step 3; $\Delta R^2 = .003$ for Step 4 (*ns* for Step 1; *ps* < .001 for Steps 2 and 3; $p < .01$ for Step 4).
[a] Race: 1 = White; 2 = non-White. [b] Sex: 1 = men; 2 = women. [c] Marital status: 1 = married; 2 = unmarried.
* $p < .05$. ** $p < .01$. *** $p < .001$.

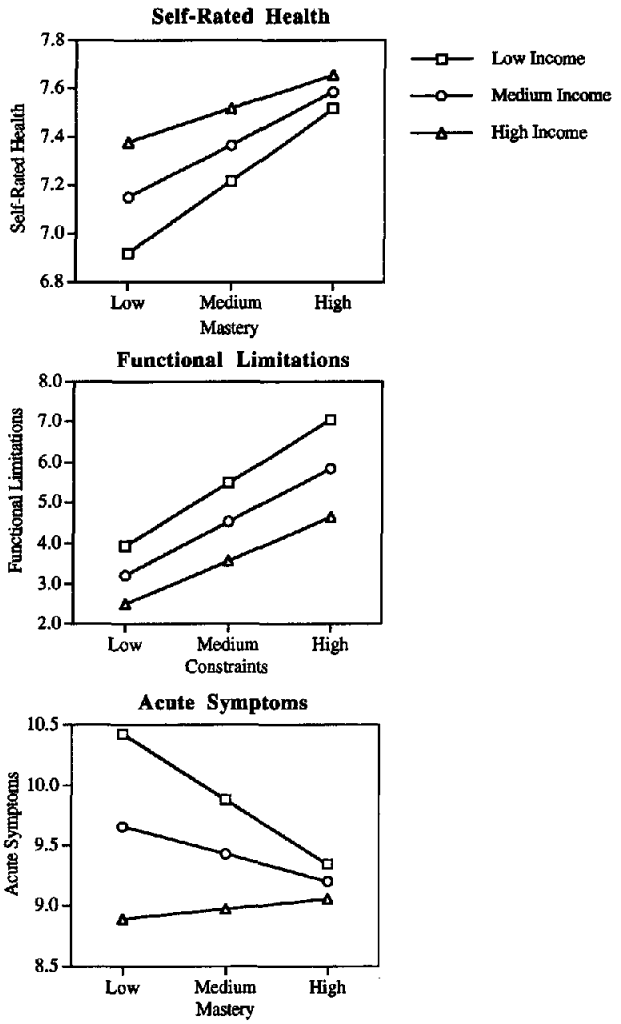

Figure 2. Predicted regression lines for physical health outcomes in Study 3.

Chronic Problems

Women and older adults reported a greater number of chronic health problems. Although significant at Step 2, income was not a significant predictor of chronic health problems in the final model. Mastery and constraints were added at Step 3. In the final model, perceived constraints, but not mastery, was associated with a greater number of chronic health problems. Neither interaction was significant.

Acute Symptoms

Caucasians, women, and married respondents reported greater acute symptoms. Income was negatively related to acute symptoms. Greater perceived constraints was associated with more acute symptoms. The significant Income × Mastery interaction, shown in Figure 2, indicates that high-mastery respondents had similar levels of acute symptoms regardless of income. However, low-mastery respondents at low income levels reported greater symptoms than low-mastery respondents at higher income levels.

Discussion

There were convergent findings from the three national samples regarding social class differences in the sense of control and the relationship between control and health, as well as in the moderating role of control beliefs. Consistent with previous work (G. Gurin & Gurin, 1970; Lachman, 1985), there was evidence for significant differences in control beliefs by economic status. Those in lower income groups indeed had lower levels of perceived mastery and stronger beliefs in the existence of external constraints in their lives. To some extent, these differences may be realistic and reflective of the actual variations in life situations among social class groups. Just as important as these differences between groups, however, were the large within-groups differences. The variability within groups was comparable, as evidenced by the standard deviations, and the group distributions were overlapping. Thus, there are some individuals with lower incomes who have high levels of mastery beliefs and low levels of perceived constraints. At the same time, some individuals in the higher income groups have a low sense of control. One interesting focus for future work is to look at the possible antecedents of control beliefs in these different social class groups. For example, how is it that some individuals in the lower social class groups come to develop and maintain a strong sense of control, both in terms of personal mastery and low perceived constraints, in the face of economic adversity?

What about the adaptive value of the sense of control? Does it vary by social class group? Overall, the findings suggest that a high sense of mastery and a belief in low external constraints are beneficial for all social class groups. Those with higher mastery and lower perceived constraints had higher life satisfaction, better perceived health, and lower depression. These relationships did vary somewhat by social class. There was no evidence, however, that high mastery and low perceived constraints were detrimental for the lower income groups. Of particular interest, control was found to play a moderating role, with even greater benefit for lower income groups. For the higher social class groups, health and well-being were generally high and showed less variation as a function of level of control than in the other social class groups. In contrast, for lower social class groups, level of control mattered. The results demonstrated that those in the lower social class groups who managed to maintain a high sense of control resembled their higher social class counterparts more than others in their own income group. Thus, control beliefs appear to serve as a buffer for the negative ramifications of low social class in regard to health and well-being. There was no consistent pattern regarding when the significant Income × Control interaction involved mastery and when it involved constraints.

Although the results were strikingly consistent across the three data sets, there were some limitations. In the present studies, the indicators of well-being and health were all based on self-report measures. Although these measures are useful and are related to actual health and mortality (Idler & Kasl, 1991), it will be important in future work to determine whether the patterns are the same as for more objective measures of illness

Table 9
Summary of Hierarchical Regression Analyses for Variables Predicting Health Outcomes in Study 3

Variable	Functional limitations (N = 2,897) B	*SE* B	β	Total R^2	Chronic problems (N = 2,894) B	*SE* B	β	Total R^2	Acute symptoms (N = 2,891) B	*SE* B	β	Total R^2
Step 1				.10				.05				.03
Race[a]	0.95	.34	.05**		−0.17	.16	−.02		−1.71	.41	−.07***	
Sex[b]	1.05	.22	.08***		0.51	.10	.09***		1.85	.26	.12***	
Age	0.12	.01	.25***		0.03	.004	.15***		−0.01	.01	−.02	
Marital status[c]	−0.03	.25	−.002		0.10	.11	.02		−0.78	.29	−.05**	
Step 2				.14				.06				.05
Income	−0.51	.07	−.15***		−0.05	.03	−.04		−0.24	.08	−.06**	
Step 3				.18				.12				.15
Mastery	−0.17	.12	−.03		−0.09	.05	−.03		−0.22	.14	−.03	
Constraints	1.03	.10	.20***		0.55	.04	.25***		1.91	.12	.32***	
Step 4				.19				.13				.15
Income × Mastery	0.10	.06	.03		0.05	.03	.03		0.16	.07	.05*	
Income × Constraints	−0.10	.05	−.04*		−0.01	.02	−.01		0.05	.05	.02	

Note. For functional limitations, R^2 = .10 for Step 1; ΔR^2 = .04 for Step 2; ΔR^2 = .04 for Step 3; ΔR^2 = .004 for Step 4 ($ps < .001$ for Steps 1, 2, and 3; $p < .05$ for Step 4). For chronic problems, R^2 = .05 for Step 1; ΔR^2 = .01 for Step 2; ΔR^2 = .06 for Step 3; ΔR^2 = .002 for Step 4 ($ps < .001$ for Steps 1, 2, and 3; *ns* for Step 4). For acute symptoms, R^2 = .03 for Step 1; ΔR^2 = .02 for Step 2; ΔR^2 = .10 for Step 3; ΔR^2 = .002 for Step 4 ($ps < .001$ for Steps 1, 2, and 3; $p < .05$ for Step 4).
[a] Race: 1 = White; 2 = non-White. [b] Sex: 1 = men; 2 = women. [c] Marital status: 1 = married; 2 = unmarried.
* $p < .05$. ** $p < .01$. *** $p < .001$.

and disease. Also, the possibility that health and well-being influence control beliefs and income is plausible and cannot be ruled out given the cross-sectional designs. The generalizability of the findings to those in very low income groups should be examined further, given that the samples studied were positively biased in social class and not completely representative of the U.S. population.

Consistent with past research, we found evidence that control beliefs are related to several different aspects of health (Rodin, 1986). Little is known, however, about the possible mediators of the relationship between mastery–constraints and health. Both behavioral and physiological factors are viable possibilities. Those who have a greater sense of control are more likely to take action, to engage in health-promoting behaviors, and to avoid health-damaging behaviors (Rodin, 1986; Strickland, 1978). Because individuals with a high sense of control believe that what they do makes a difference, they behave in healthier ways (Lachman, Ziff, & Spiro, 1994; Ziff, Lachman, & Lewkowicz, 1996; Rodin, 1986). In contrast, those who have a helpless orientation and fail to see contingency between actions and outcomes are more prone to illness and disease (Peterson & Stunkard, 1989), perhaps because they engage in behaviors that are damaging to their health or fail to engage in practices that are health-promoting.

There is also evidence that having a sense of control has physiological concomitants. Those who have a high sense of control have lower cortisol levels and return more quickly to baseline levels after stress (Seeman, 1995; Seeman et al., 1995). Those who have a sense of control over work also show lower fibrinogen levels, the factor related to blood clotting (Davis, Matthews, Meilahn, & Kiss, 1995; Markowe et al., 1985). Also, there is evidence that having control may affect the immune system's ability to fight off disease (Rodin, 1986). Future work should consider whether these potential mediators of the effects of control beliefs on health are similar across social class groups.

The present results may contribute to understanding the social class health gradient, which shows poorer health for those in lower income and occupational groups (Adler et al., 1994; Marmot et al., 1991). Although SES is consistently associated with health outcomes, little is known about the psychosocial and behavioral mechanisms that might explain this association. This relationship with health is found at all SES levels and does not exist only for the poorest groups (Adler et al., 1994). Thus, the finding is not simply due to obvious differences in access to health care or poor living conditions because the gradient occurs even at the higher end of the social class distribution. Adler et al. suggested the need to explore moderating variables such as control beliefs in the social class health gradient.

The present findings are consistent with the view that psychosocial resources may be involved in the gradient, as there was consistent evidence that the social class differences in subjective measures of health were reduced by a high sense of mastery and low perceived constraints. The differential sense of control may be one factor involved in the gradient. People in lower class groups have poorer health and a lower sense of control, on average, compared with people in higher class groups. The interesting pattern that warrants further attention in future research is that those in the lower income

group who had a higher sense of control resembled those in the higher income groups. If further evidence emerges that supports the importance of the sense of control as a buffer or resource for the economically disadvantaged, this would suggest important directions for intervention work aimed at prevention and remediation of the deleterious effects of social class on health and well-being.

References

Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R., and Syme, L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist, 49,* 15–24.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bureau of Labor Statistics. (1994, March). *Current population survey.* Washington, DC: Bureau of the Census.

Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Davis, M. C., Matthews, K. A., Meilahn, E. N., & Kiss, J. E. (1995). Are job characteristics related to fibrinogen levels in middle-aged women? *Health Psychology, 14,* 310–318.

Gurin, P., & Brim, O. G., Jr. (1984). Change in self in adulthood: The example of sense of control. In P. B. Baltes & O. G. Brim, Jr. (Eds.), *Life-span development and behavior* (Vol. 6, pp. 218–334). New York: Academic Press.

Gurin, G., & Gurin, P. (1970). Expectancy theory in the study of poverty. *Journal of Social Issues, 26,* 83–104.

Gurin, P., Gurin, G., & Morrison, B. M. (1978). Personal and ideological aspects of internal and external control. *Social Psychology, 41,* 275–296.

Idler, E. L., & Kasl, S. (1991). Health perceptions and survival: Do global evaluations of health status really predict mortality? *Journal of Gerontology: Psychological Sciences, 46,* S55–S65.

Jaccard, J., Turrisi, R., & Wan, C. K. (1990). *Interaction effects in multiple regression.* Newbury Park, CA: Sage.

Lachman, M. E. (1985). Personal efficacy in middle and old age: Differential and normative patterns of change. In G. H. Elder, Jr. (Ed.), *Life-course dynamics: Trajectories and transitions, 1968–1980* (pp. 188–213). Ithaca, NY: Cornell University Press.

Lachman, M. E. (1986). Locus of control and aging research: A case for multidimensional and domain-specific assessment. *Psychology and Aging, 1,* 34–40.

Lachman, M. E., Ziff, M. A., & Spiro, A. (1994). Maintaining a sense of control in later life. In R. Abeles, H. Gift, & M. Ory (Eds.), *Aging and quality of life* (pp. 116–132). New York: Sage.

Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology, 32,* 311–328.

Langer, E. J., & Rodin, J. (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology, 34,* 191–198.

Levenson, H. (1981). Differentiating among internality, powerful others, and chance. In H. M. Lefcourt (Ed.), *Research with the locus of control construct: Assessment methods* (Vol. 1, pp. 15–63). New York: Academic Press.

Markowe, H. L. J., Marmot, M. G., Shipley, J. J., Bulpitt, C. J., Meade, T. W., Stirling, Y., Vickers, M. V., & Semmence, A. (1985). Fibrinogen: A possible link between social class and coronary heart disease. *British Medical Journal, 291,* 1312–1314.

Marmot, M. G., Smith, G. D., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Brunner, E., & Feeney, A. (1991). Health inequalities among British civil servants: The Whitehall II study. *The Lancet, 337,* 1387–1393.

Newman, K. S. (in press). Place and race: Midlife experience in Harlem. In R. Shweder (Ed.), *The idea of middle age.* Chicago: University of Chicago Press.

Pearlin, L., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior, 19,* 2–21.

Peterson, C., & Stunkard, A. J. (1989). Personal control and health promotion. *Social Scientific Medicine, 28,* 819–828.

Rodin, J. (1986, September 19). Aging and health: Effects of the sense of control. *Science, 233,* 1271–1276.

Rodin, J., Timko, C., & Harris, S. (1985). The construct of control: Biological and psychosocial correlates. In C. Eisdorfer, M. P. Lawton, & G. L. Maddox (Eds.), *Annual review of gerontology and geriatrics* (pp. 3–55). New York: Springer.

Schulz, R. (1976). The effects of control and predictability on the physical and psychological well-being of the institutionalized aged. *Journal of Personality and Social Psychology, 33,* 563–573.

Schulz, R., & Hanusa, B. H. (1978). Long-term effects of control and predictability-enhancing interventions: Findings and ethical issues. *Journal of Personality and Social Psychology, 36,* 1194–1201.

Seeman, T. E. (1995, August). *Resiliency in aging: HPA Axis response to challenge in older adults.* Paper presented at the 103rd Annual Convention of the American Psychological Association, New York.

Seeman, T. E., Berkman, L. F., Gulanski, R., Robbins, S., Greenspan, S., Charpentier, P., & Rowe, J. (1995). Self-esteem and neuroendocrine response to challenge: MacArthur Successful Aging Studies. *Psychosomatic Research, 39,* 69–84.

Seligman, M. E. P. (1975). *Helplessness: On depression, development, and death.* San Francisco: Freeman.

Seligman, M. E. P. (1991). *Learned optimism.* New York: Knopf.

Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology, 71,* 549–570.

Strickland, B. R. (1978). Internal–external expectancies and health-related behaviors. *Journal of Consulting and Clinical Psychology, 46,* 1192–1211.

Taylor, S. E. (1989). *Positive illusions: Creative self-deception and the healthy mind.* New York: Basic Books.

Thompson, S. C., Cheek, P. R., & Graham, M. A. (1988). The other side of perceived control: Disadvantages and negative effects. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health* (pp. 69–93). Newbury Park, CA: Sage.

Wortman, C. B., Sheedy, C., Gluhoski, V., & Kessler, R. (1992). Stress, coping, and health: Conceptual issues and directions for future research. In. H. S. Friedman (Ed.), *Hostility, coping, and health* (pp. 227–256). Washington, DC: American Psychological Association.

Ziff, M. A., Lachman, M. E., & Lewkowicz, C. (1996). *The relationship between sense of control and health in middle-aged and older adults: Lifestyle as mediator.* Manuscript submitted for publication.

Received April 8, 1996
Revision received April 22, 1997
Accepted May 6, 1997 ■