

SUBJECTIVE SOCIAL STATUS: RELIABILITY AND PREDICTIVE UTILITY FOR GLOBAL HEALTH

DON OPERARIO^{a,*}, NANCY E. ADLER^b and DAVID R. WILLIAMS^c

^a*Center for AIDS Prevention Studies (CAPS), University of California, San Francisco, 74 New Montgomery Street, Suite 600, San Francisco CA 94105;*

^b*Health Psychology Program, University of California, San Francisco;*

^c*Institute for Social Research, University of Michigan*

(Received 7 May 2002; In final form 10 October 2003)

This article examines the test–retest reliability and predictive utility of a new self-report measure of subjective socioeconomic status (SES) with a large, multiethnic national sample. The measure showed adequate test–retest reliability, and was associated with self-reported health even after controlling for traditional measures of SES. Negative affect did not appear to confound the association between subjective status and health, but may operate as a mediating factor which explains the link between subjective status and health. Future studies on social class disparities in health should consider how subjective perceptions of SES influence health, and explore psychological processes mediating subjective beliefs about status and health outcomes.

Keywords: Social status; Hierarchy; Measurement; Health disparities

INTRODUCTION

A substantial body of research has documented a gradient between socioeconomic status (SES) and health (Adler *et al.*, 1994). Higher SES is associated with better health not just at the threshold of poverty, but also at every increment of social status – from the very lowest classes, throughout the middle classes, to the highest classes (Marmot *et al.*, 1984). These findings suggest that the association between SES and health derives not just from basic health and survival needs. Social and psychological variables associated with one's standing in a social hierarchy may also contribute to overall health (Baum *et al.*, 1999; Kawachi, 1999; Wilkinson, 1999).

Most prior research examining SES gradients in health have used objective indicators to measure social status, such as occupational status, income, and education. However, emerging findings indicate that people's subjective beliefs about their social status can be more consistently and strongly related to overall health compared to objective indicators of social status (Adler *et al.*, 2000). This may be because subjective ratings

*Corresponding author. Fax: 415-597-9194. E-mail: doperario@psg.ucsf.edu

more accurately capture subtle aspects of social status. In measures of education, for example, the implication for one's life opportunities of having received a degree from an Ivy League school are different from receipt of a degree from a local college, but in standard measures of educational status, both would be coded the same. Individuals may summate across different indicators of objective status, so that the resulting subjective measure may be a more valid measure of overall SES. To some extent, this may function in a similar way to self-rated health, which has been shown to predict mortality even when known objective risk factors are controlled in multivariate analyses (Mossey and Shapiro, 1982; Idler and Benyamini, 1997).

Subjective social status could affect health in part through psychological pathways. For example, feelings of anxiety, stress, and inequality which are associated with perceptions of relatively low social status could be associated with physiological responses that influence health (Baum *et al.*, 1999; Adler *et al.*, 2000). Alternatively, feelings of security and hope derived from perceptions of high social status could provide psychological buffers against some stressors by acting through immunological mediating pathways (see Segerstrom *et al.*, 1998).

Preliminary research using a new measure of subjective social status has shown that it is related to health independent of objective social status. In a study of a multiethnic sample of pregnant women (Ostrove *et al.*, 2000) respondents were shown a picture of a ladder with 10 rungs, and asked to rate where they stand in the socioeconomic hierarchy relative to other people in society based on their income, education, and occupation. They found significant associations of subjective status and self-rated health among all ethnic groups. This association held independent of income or occupation for Whites and Chinese Americans. For Hispanics and African Americans, however, only income showed an independent association with health. A sample of healthy White women, studied by Adler *et al.* (2000), ranked themselves on the same ladder. Again, subjective status ratings were related to a number of indicators of physical and mental health independent of the contribution of income and education. This study also found a strong association between subjective status and negative affect ($r = -0.31$), but ruled out negative affect as a third-variable confounding the association between subjective status and health. After controlling for negative affect, the association between subjective status and health remained robust.

However, Adler *et al.* (2000) noted that adjusting for negative affect when examining the association of subjective status and health, out of concern that it leads both to lower subjective status ratings and to lower self-rated health ratings, may be conceptually inappropriate. Such adjustment assumes that negative affect confounds the association of subjective status and health by serving as an underlying third variable. However, an equally compelling hypothesis is that negative affect mediates the association of subjective status and health: lower subjective status affects health (at least in part) through increasing negative affect. If the latter is true, automatically controlling for negative affect as a confounder rather than interpreting it as a mediator will underestimate the association of subjective status and health.

One way to evaluate whether negative affect confounds or mediates the association of subjective status and health is to examine parallel analyses of the relationship of health and negative affect with subjective and objective status. The problem of

confounding of negative affect and objective SES is minimal. There is no reason to believe that greater negative affect would lead people to underreport how much education they had obtained or how much income they earned. Thus, reduction in the association of objective SES and health, once negative affect is controlled for, is likely due to a mediation effect. If the mediation hypothesis regarding subjective status is correct, negative affect should play the same role in relation to the association of subjective status and health, and a comparable reduction in the association of subjective status and health should occur when negative affect is controlled. A more substantial drop in the association between subjective status and health than between objective status and health when negative affect is controlled for would argue that, in addition to mediation, there may be additional confounding of subjective status and health.

In sum, if controlling for negative affect results in a much greater reduction in the association of subjective status and health than it does in the association of objective status and health, this would be evidence that subjective status and negative affect are uniquely confounded. If there are similar reductions in the health association for both objective and subjective status, we can infer that negative affect is not uniquely confounded with subjective status and, accordingly, conceptualize negative affect as a mediating factor in the pathway between subjective status and health.

In this article, we extend prior research on subjective status in four ways. First, we examine the test–retest reliability of subjective social status, by comparing people’s responses over a 6-month time span. Second, we examine the relationship between subjective social status and health using a national sample; prior studies have been only on women and/or in specific geographic locales. Third, we examine the role of negative affect in the relationship between subjective social status and health, i.e., whether negative affect is uniquely confounded with subjective status compared with objective status. Fourth, the current research tests a phone-interview version of the ladder, in contrast to the paper-and-pencil measure used in prior research.

METHOD

Procedure

Participants were a national sample of adults, ages 18 and over, living in the contiguous United States. They were contacted via random digit dialing as part of an ongoing consumers’ survey. The survey uses a rotating monthly panel design in which 500 respondents are interviewed each month, with about 300 being new respondents and the remainder (about 200) being a random two-thirds of the monthly sample six months after they were initially interviewed (this procedure derived from Waksberg, 1978). Probability weights were assigned to different area codes and prefixes based on population statistics, and the last four digits were randomly generated by computer. One adult per household was randomly selected as respondent. We added a measure of subjective social status for five consecutive months in 1998, to the new national sample of just under 300 respondents, and to 191 of the first month’s respondents that were re-interviewed six months after their initial interview. Data were provided by 1294 participants, 191 of whom completed a second interview 6 months later. Response rate for the survey ranged between 0.69 and 0.71.

TABLE I Descriptive sample characteristics

	%	(n)
Age Group		
Less than 30	21	(299)
31–40	23	(325)
41–50	23	(320)
51–60	13	(190)
60+	20	(289)
Sex		
Female	55	(782)
Male	45	(641)
Race		
White	76	(1086)
African American	10	(137)
Hispanic	7	(95)
Other	7	(105)
Self-Rated Health		
Poor	3	(37)
Fair	13	(168)
Good	26	(345)
Very Good	40	(529)
Excellent	18	(240)
Subjective Social Status ^a		
First step	3	(32)
Second step	2	(26)
Third step	5	(58)
Fourth step	8	(98)
Fifth step	27	(354)
Sixth step	18	(233)
Seventh step	21	(276)
Eighth step	12	(158)
Ninth step	3	(33)
Tenth step	2	(27)
Income level		
< \$15 000	9	(127)
\$15 001–25 000	13	(179)
\$25 001–35 000	16	(228)
\$35 001–50 000	24	(346)
\$50 001–75 000	20	(269)
\$75 001–100 000	9	(124)
Over \$100 000	11	(149)
Education		
Less than HS diploma	9	(121)
HS diploma, GED, or some college	53	(725)
College degree or more	39	(529)
Health problems diagnosed by medical professional		
High blood pressure	21	(280)
Heart attack or heart problems	7	(88)

^aSubjective social status measured using our ladder scale with 10 steps. The first step represents those worst off and the tenth step represents those best off.

Participants

The average age of participants was 45.5 years. Fifty-five percent of the sample were women. The sample was predominantly white (76%), with 10% identifying themselves as African American, 7% as non-White Hispanic, and 7% as others. There were no differences in demographic variables for those who were followed up (see Table I for characteristics of the full sample).

Measures

Subjective social status scale Respondents rated their subjective social status using the Scale of Subjective Status (Adler *et al.*, 2000; Ostrove *et al.*, 2000). Participants were instructed:

Think of a ladder with 10 steps representing where people stand in the United States. At step 10 are people who are the best off – those who have the most money, the most education, and the most respected jobs. At step 1 are the people who are worst off – those who have the least money, least education, and the least respected jobs or no job. Where would you place yourself on this ladder?

The sample rated themselves on average above the midpoint of the scale at both baseline ($M = 5.85$; $SD = 1.78$; range 1–10), and follow-up ($M = 6.05$; $SD = 1.63$; range 1–10).

Global health Participants rated their overall general health, using a 5-point scale, both in the initial interview and 6 months later. Labels were 1 = *poor*, 2 = *fair*, 3 = *good*, 4 = *very good*, and 5 = *excellent*. Average global health rating was 3.58 ($SD = 1.02$), and 3.50 ($SD = 1.05$) at first and second interviews respectively.

Objective SES Traditional SES indicators included family income and personal education level, and were measured only at baseline. Family income was coded into seven categories:

- (1) \$15 000 or less (8.9%);
- (2) \$15 001–25 000 (12.6%);
- (3) \$25 001–35 000 (16.0%);
- (4) \$35 001–50 000 (24.3%);
- (5) \$50 001–75 000 (18.9%);
- (6) \$75 001–100 000 (8.7%); and
- (7) over \$100 000 (10.5%).

Education level was coded into three categories: (1) less than high school (8.8%); (2) high school diploma, GED, or some college (52.7%); and (3) college diploma or higher (38.5%).

Negative affect Negative affect was measured using a scale developed and validated by Kessler *et al.* (2002). Participants reported how often “over the past 30 days they felt (1) so sad nothing can cheer you up, (2) nervous, (3) restless, (4) hopeless, (5) worthless, and (6) that everything is an effort.” Items were rated on scales with endpoints 1 = *never* and 5 = *very often*, and were averaged to form a composite measure ($\alpha = 0.83$). Negative affect was measured only at baseline, and had an overall mean of 2.23 ($SD = 0.80$; range 1–5).

Health risk factors Two health risk factors were included in the analyses to rule out potential confounds to our research questions. Participants reported if “a doctor or other health professional has ever told you that you have (1) high blood pressure, (2) heart attack or heart problems.” Items were answered on a dichotomous *yes/no* scale.

Analyses

Spearman’s rank-order correlations were used to examine test–retest reliability of subjective status. Pearson bivariate correlations were used to examine zero-order

associations between all variables including demographics, health, negative affect, subjective status, income, and education.

Hierarchical Ordinary Least Squares (OLS) regression was used to examine independent associations of three SES indicator variables (subjective status, income, and education) with self-rated health. Each predictor was separately entered as the final step in the model. In Model 1, control variables (age, sex, race, high blood pressure, heart attack, or heart problems) were first entered, followed by the SES indicator. In Model 2, control variables and negative affect were entered, then the SES indicator. In Model 3, control variables, negative affect, and alternative SES indicators, followed by the SES indicator (i.e., for subjective status as indicator, income and education were entered as controls; for income as indicator, subjective status and education were entered as controls; for education as indicator, subjective status and income were entered as controls). Beta coefficients for each predictor are reported, as well as independent changes in variance accounted for by each new step of the model (ΔR^2). All statistical analyses were conducted using SPSS Version 10.

RESULTS

Test–Retest Reliability of Subjective Social Status Measures

Spearman's rank-order correlations between the baseline and follow-up ladders revealed adequate test–retest reliability. The correlation coefficient between baseline and follow-up was significant, $\rho = 0.62$ ($p < 0.01$).

Associations Between SES Measures, Negative Affect, and Health

Table II shows the bivariate correlations on baseline measures of subjective status, objective SES, global health, negative affect, and age. All are in the expected direction and are consistent with prior studies (Adler *et al.*, 2000; Ostrove *et al.*, 2000). Subjective status is positively correlated with income, education, and health, and inversely related to negative affect. Health ratings show a slightly stronger correlation with subjective status ($r = 0.31$) than with income or education (both $rs = 0.25$).

TABLE II Correlations between SES indicators and other variables

	<i>SES Indicator</i>		
	<i>Subjective Status</i>	<i>Income</i>	<i>Education</i>
Age	0.06*	-0.02	-0.09**
Sex ^a	-0.07**	-0.14**	-0.06*
Race ^b	-0.12**	-0.18**	-0.12**
Self-rated health	0.31**	0.25**	0.25**
High blood pressure	-0.08**	-0.08**	-0.11**
Heart attack/problems	-0.02	-0.07*	-0.06*
Negative affect	-0.31**	-0.24**	-0.21**
Subjective status	–	0.39**	0.37**
Income	0.39**	–	0.43**
Education	0.37**	0.43**	–

* $p < 0.05$; ** $p < 0.01$; ^aSex was coded such that 0=male and 1=female; ^bRace was coded such that 0=white and 1=non-white.

TABLE III Three regression models for each of the SES indicators predicting self-rated health

	<i>SES Indicator</i>					
	<i>Subjective Status</i>		<i>Income</i>		<i>Education</i>	
	β	ΔR^2	β	ΔR^2	β	ΔR^2
Model 1, controls for Age Sex Race Health risk	0.30**	0.08**	0.21**	0.04**	0.21**	0.04**
Model 2, controls for above and negative affect	0.20**	0.04**	0.13**	0.02**	0.13**	0.13**
Model 3, controls for above and other SES indicators ^a	0.17**	0.02**	0.06*	0.002*	0.05 ⁺	0.002 ⁺

Note: For Models 1–3, each independent SES indicator was entered separately as the final step in the model.

^aFor subjective status as indicator, Model 3 controls for income and education; for income as indicator, Model 3 controls for subjective status and education; for education as indicator, Model 3 controls for subjective status and income.

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

Table III shows the multivariate associations between objective SES, subjective status, negative affect, and health, using OLS regression. Model 1 shows the betas for the regression of health on income, education, and subjective status (independent variables), controlling for age, sex, race, and health risk factors. Model 2 shows betas controlling for negative affect as well as age, sex, race, and health risk factors. Model 3 shows betas for each independent SES variable (subjective status, income, and education) controlling for the other two SES variables as well as for negative affect, age, sex, race, and health risk factors. In the final step of all three models, each of the SES indicators maintains a significant association with health. Of the three SES measures, subjective status had the largest beta across all three models. In Model 3, in which negative affect and the other SES indicators are controlled for, subjective status is notably stronger than income or education as an independent variable.

As evident in the change in betas (β) and the additional variance accounted for (ΔR^2) between Models 1 and 2, including negative affect in the equation did not diminish the association between subjective status and health any more than it did for income or education. This suggests that negative affect is not uniquely confounded with subjective status, relative to its association with traditional SES measures.

DISCUSSION

Findings from this research corroborate the utility of a new measure of subjective social status for predicting health. This is the first study to examine this relationship using a large, representative national sample, and the first to show the stability of people's subjective appraisals of SES over time. We found that this measure can be administered verbally, in addition to visually as in prior work. Moreover, findings suggest that negative affect does not confound the association between subjective status and health operating as a third variable biasing responses on self ratings of status and health. Consistent with prior research (Adler *et al.*, 2000), this finding suggests

that negative affect might play an important mediating role in the pathway between subjective status and reported health.

The results are consistent with the body of findings linking social status and health via SES-related environmental, social, and psychological pathways (Adler and Newman, 2002). Most prior studies use traditional demographic criteria such as income or education as markers of people's social status. Our findings underscore the role of people's perceptions of their social status – which reflect but can differ from objective measures – that independently predicts health ratings above and beyond traditional indicators.

Even though it is a single item, the subjective status measure may provide a good summative indicator of status across different aspects of socioeconomic standing. Recent findings from the Whitehall study of British civil servants showed that subjective status was best predicted by a set of socioeconomic variables including employment grade, household income, education, and feelings of financial security. Notably, psychosocial factors did not independently contribute to subjective status ratings (Singh-Manoux *et al.*, 2003).

The findings here are consistent with arguments put forth by Wilkinson (1996) whose research has shown that income inequality better predicts health than does absolute levels of income. His international analysis of morbidity and mortality levels showed that countries with more social inequality have lower life expectancy compared to countries with less inequality. Indeed, social inequality was found to be the most consistent predictor of life expectancy. Some poor countries with little social inequality had higher life expectancies than rich countries. An explanation offered for this finding referred to the adverse social and psychological consequences of inequality, such as increased stress levels, poor social cohesion, and inadequate community and interpersonal support in coping with daily life. This argument evinces the validity of measuring people's subjective appraisals of their social standing, in addition to the traditional measures.

There are multiple explanations for the association between subjective social status and health. Our findings indicated that negative affect may operate as a mediator, such that increased subjective status can reduce levels of psychological distress that impact health. Other factors may also mediate this relationship, such as sleep quality (Moore *et al.*, 2002), stress and adversity (Taylor and Seeman, 1999), pessimism and feelings of control (Cohen *et al.*, 1999), and negative emotions (Gallo and Matthews, 2003). It is becoming increasingly evident that there is no simple explanation for the SES-health gradient. Thus, future research and policy strategies for addressing this challenge must consider psychological, environmental, and behavioral contributions.

Limitations to this study include the use of cross-sectional analyses for testing the association between SES and health, and the use of a single-item measure of global health (see Idler and Benyamini, 1997). Although analyses controlled for two common risk factors (high blood pressure and heart attack/problems), we did not control for other risk factors such as smoking, body mass index, etc., due to restrictions in the data set. Further, we could not include other psychological variables that potentially mediate the SES-health link. Future work should examine more sophisticated psychological models including control (Thompson *et al.*, 1994), optimism (Segerstrom *et al.*, 1998), and social comparisons (Taylor and Lobel, 1989) that each have been found to influence health and may also be associated with subjective social status.

Overall, the findings here suggest that subjective appraisals of social status can influence health. As continued research and policy work seek to diminish health disparities associated with class, race, and gender, findings reported here substantiate the need to investigate psychological processes that contribute to health, including how people perceive themselves and their quality of life.

Acknowledgments

The research on this article was supported by a grant from the John D. and Catherine T. MacArthur Foundation Research Network on Socioeconomic Status and Health. We would like to thank Mark Musick for assistance in preparing the article.

References

- Adler, N.E., Boyce, T., Chesney, M.A., Cohen, S., Folkman, S., Kahn, R.L. and Syme, S.L. (1994). Socioeconomic status and health: the challenge of the gradient. *American Psychologist*, **49**, 15–24.
- Adler, N.E., Epel, E., Castellazzo, G. and Ickovics, J. (2000). Relationship of subjective and objective social status with psychological and physical health: preliminary data in healthy white women. *Health Psychology*, **19**, 586–592.
- Adler, N.E. and Newman, K. (2002). Socioeconomic disparities in health: pathways and policies. *Health Affairs*, **21**, 60–76.
- Baum, A., Garafalo, J.P. and Yali, A.M. (1999). Socioeconomic status and chronic stress: does stress account for SES effects on health? In: N.E. Adler, M. Marmot, B.S. McEwen and J. Stewart (Eds.), *Socioeconomic Status and Health in Industrial Nations: Social, Psychological, and Biological Pathways*, pp. 131–144. New York Academy of Science, New York, NY.
- Cohen, S., Kaplan, G.A. and Salonen, J. (1999). The role of psychological characteristics in the relation between socioeconomic status and perceived health. *Journal of Applied Social Psychology*, **29**, 445–468.
- Gallo, L.C. and Matthews, K.A. (2003). Understanding the association between socioeconomic status and health: do negative emotions play a role? *Psychological Bulletin*, **129**, 10–51.
- Idler, E.L. and Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health and Social Behavior*, **38**, 21–37.
- Kawachi, I. (1999). Social capital and community effects on population and individual health. In: N.E. Adler, M. Marmot, B.S. McEwen and J. Stewart (Eds.), *Socioeconomic Status and Health in Industrial Nations: Social, Psychological, and Biological Pathways*, pp. 120–130. New York Academy of Sciences, New York, NY.
- Kessler, R.C., Andrews, G., Colpe, L.J., Hiripi, E., Mroczek, D.K., Normand, S.L., Walter, E.E. and Zaslavsky, A.M. (2002). Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*, **32**, 959–976.
- Marmot, M.G., Shipley, M.J. and Rose, G. (1984). Inequalities in death: specific explanations of a general pattern? *Lancet*, **1**, 1003–1006.
- Moore, P.J., Adler, N.E., Williams, D.R. and Jackson, J.S. (2002). Socioeconomic status and health: the role of sleep. *Psychosomatic Medicine*, **64**, 337–344.
- Mossey, J.M. and Shapiro, E. (1982). Self-rated health: a predictor of mortality among the elderly. *American Journal of Public Health*, **72**, 800–808.
- Ostrove, J.M., Adler, N.E., Kuppermann, M. and Washington, A.E. (2000). Objective and subjective assessments of socioeconomic status and their relationship to self-rated health in an ethnically diverse sample of pregnant women. *Health Psychology*, **19**, 613–618.
- Segerstrom, S.C., Taylor, S.E., Kemeny, M.E. and Fahey, J.L. (1998). Optimism is associated with mood, coping, and immune change in response to stress. *Journal of Personality and Social Psychology*, **74**, 1646–1655.
- Singh-Manoux, A., Adler, N.E. and Marmot, M.G. (2003). Subjective social status: its determinants and its association with measures of ill-health in the Whitehall II study. *Social Science and Medicine*, **56**, 1321–1333.
- Taylor, S.E. and Lobel, M. (1989). Social comparison activity under threat: downward evaluation and upward contacts. *Psychological Review*, **96**, 569–575.
- Taylor, S.E. and Seeman, T.E. (1999). Psychosocial resources and the SES-health relationship. In: N.E. Adler, M. Marmot, B. McEwen and J. Stewart (Eds.), *Socioeconomic status and health in industrial*

- nations: Social, psychological, and biological pathways*, pp. 210–225. New York Academy of Sciences, New York, NY.
- Thompson, S.C., Nanni, C. and Levine, A. (1994). Primary versus secondary and central versus consequence-related control in HIV-positive men. *Journal of Personality and Social Psychology*, **96**, 506–520.
- Waksberg, J. (1978). Sampling methods for random digit dialing. *Journal of the American Statistical Association*, **73**, 40–46.
- Wilkinson, R.G. (1996). *Unhealthy Societies: The Afflictions of Inequality*. Routledge, London.
- Wilkinson, R.G. (1999). Health, hierarchy, and social anxiety. In: N.E. Adler, M. Marmot, B.S. McEwen and J. Stewart (Eds.), *Socioeconomic Status and Health in Industrial Nations: Social, Psychological, and Biological Pathways*, pp. 48–63. New York Academy of Sciences, New York, NY.