Published in final edited form as:

J Health Psychol. 2019 December ; 24(14): 1923–1928. doi:10.1177/1359105317709511.

Comparison group matters for chronic stress effects of subjective social status

Ashley M Geiger¹, Clemens Kirschbaum², Jutta M Wolf¹

¹Brandeis University, USA

²Technische Universität Dresden, Germany

Abstract

Inconsistent associations between health and measures of subjective social status compared to one's community suggest that how people define community may matter. This study broke down community into status among neighborhood and friends/family to assess the impact of each domain on chronic stress in individuals differing in socioeconomic status (18 employed and 18 unemployed individuals). The findings suggest that for ratings of subjective social status, the social and physical proximity of the reference group matters. Specifically, neighborhood status was affected by unemployment, while friends/family status was associated with perceived stress, emphasizing the importance of the comparison group in assessing subjective status.

Keywords

diurnal cortisol; perceived chronic stress; subjective social status; unemployment

Socioeconomic status (SES), typically defined by information such as education or income, is a well-established predictor of health (e.g. Adler et al., 1994; Marmot et al., 1984).

However, subjective social status (SSS) has emerged as an appealing alternative measure because it captures cumulative influences of social position by accounting for past experiences and perceptions of future accomplishments (Operario et al., 2004). SSS is a particularly valuable measure in populations who do not have their own SES, for example, adolescents (Goodman et al., 2001) or when SES indicators change, as in retirement or unemployment. Like lower SES, lower subjective status is associated with negative mental and physical health outcomes (Adler et al., 2000).

SSS assesses one's perceived position relative to others in the social hierarchy (Adler et al., 2000). The most common measures are the MacArthur Scales, which ask individuals to rate where they feel they stand relative to the nation and their community (however they define it) by marking the rung on a picture of a ladder where they feel they stand compared to the

Reprints and permissions: sagepub.co.uk/journalsPermissions.nav

Corresponding author: Jutta M Wolf, Department of Psychology, Brandeis University, 415 South Street, MS 062, Waltham, MA 02454, USA. jmw@brandeis.edu.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

given reference group (e.g. their community). SES and SSS are usually highly correlated (Operario et al., 2004; Singh-Manoux et al., 2003) and SES factors, specifically income and occupational position, seem to be the most powerful predictors of SSS (Ostrove et al., 2000; Singh-Manoux et al., 2003). The way subjective status is assessed may directly cause this effect. The national ladder is anchored with objective SES markers, describing individuals at the bottom as having the least money, education, and least respected job or no job (e.g. Adler et al., 2000; Ostrove et al., 2000; Singh-Manoux et al., 2003). National SSS may represent a more proximal influence on health compared to objective SES, while perceived status in the community may represent influences that are closer still than national SSS (Cundiff et al., 2013). However, fewer studies have used the community ladder and the links between community status and health outcomes are inconsistent (Cundiff et al., 2013; Reitzel et al., 2013). This may be due to a lack of understanding of exactly what the community ladder measures. Qualitative data from the MacArthur Network suggests variation in the way individuals define community, with responses falling generally into two categories: individuals close in physical proximity (neighborhood/town) and close social contacts (friends, family, religious groups; Adler and Stewart, 2007). These two categories may differ in the relevance of objective SES: comparing oneself to close social contacts may evoke more personal information than SES-related information. Thus, inconsistencies in definitions of community may contribute to the variation in health associations.

Study aims

To better understand the SSS relative to close social networks, this study aimed to separate the effects of more physical (neighborhood) versus more social (friends and family) proximity by assessing their individual impact on chronic stress: a central underlying process for many negative health outcomes. We assessed self-reported psychological stress and basal cortisol functioning, specifically the cortisol awakening response (CAR; Fries et al., 2009). Employed and unemployed individuals were evaluated to investigate the effects of lacking SES indicators most strongly predictive of SSS (income and employment grade).

Method

Participants

Participants were 18 employed and 18 unemployed age and gender-matched German individuals (24 women; mean age: 33.3 ± 9.1 years; 21–56 years). Unemployed participants were unemployed for at least 12 months in addition to looking for work and needing to generate income (average duration beyond 12 months: 16.17 ± 6.76 months; min–max: 3–26 months).

Procedure

The study was approved by the ethics board at the Technical University of Dresden. Unemployed participants were recruited through online and print advertisements in regional newspapers and employed participants through flyers and advertisements in the Technical University of Dresden and surrounding community. The experimenter visited participants' homes to obtain informed consent and provide questionnaires. Participants collected four

saliva samples on each of two consecutive weekdays (0, 30, 45, and 60 minutes following wake-up) using the Salivette device and stored them in the freezer until the experimenter returned.

Measures

Participants provided demographic information. SSS was measured using two 10-rung ladder measures adapted from the MacArthur sociodemographic questionnaire (Adler and Stewart, 2007). Participants rated their standing on the ladders with higher rungs indicating higher status. The instructions mimicked the original community ladder: “Please place a large ‘X’ on the rung where you think you stand at this time in your life, relative to other people in your neighborhood/relative to family members and friends.” Perceived stress was assessed with the 14-item German translation of the Perceived Stress Scale (Cohen et al., 1983). Saliva samples were stored at -30°C and after completion of the study, thawed, centrifuged, and assayed in duplicates using a cortisol chemiluminescence kit (IBL, Toronto, Canada; inter and intra-assay variability: $<8\%$). Values from the two corresponding samples were averaged and two indices were computed. The maximum CAR increase was computed by subtracting the wake-up value from the individual’s peak value (from the sample taken at +30 minutes, +45 minutes, or +60 minutes). The CAR recovery was computed by subtracting the +60-minute value from the individual’s maximum value (at either +30 minutes or +45 minutes).

Results

The employment groups did not differ in age, education, chronic diseases, medication use, smoking, or body mass index (BMI). Unemployed participants were more likely to be unmarried, reported poorer mental health, had lower monthly household income, and felt less secure in their current financial situation (see Table 1). Of note, controlling for any of these socioeconomic or health indicators did not change the pattern of results and thus findings are present without including them as covariates. However, for conceptual reasons, all subsequent analyses controlled for age and sex.

Employment status differences in SSS

The SSS ladders were positively correlated ($r = .46, p = .007$), with a trend for higher ratings relative to friends/family than neighborhood ($t(35) = 1.80, p = .08$; friends/family: 7.31 ± 1.74 ; neighborhood: 6.69 ± 2.10). Analyses of covariance (ANCOVAs) revealed that the unemployed reported lower neighborhood status ($F(1,32) = 6.05, p = .02, \eta_p^2 = .16$) and no difference in friends and family status ($F(1,32) = 1.53, p = .23, \eta_p^2 = .05$; see Figure 1).

Employment status differences in stress measures

Unemployed individuals reported more perceived stress than employed ($F(1,32) = 10.21, p = .003, \eta_p^2 = .24$). Both groups further showed a lack of significant changes in cortisol across the four samples (repeated-measures ANCOVA: time: $F(1.53,32) = 1.02, p = .35$; group: $F(1,32) = 0.02, p = .87$; group-by-time: $F(1,32) = 1.82, p = .18$) and for CAR increase

($F(1,32) = .64, p = .43, \eta_p^2 = .02$). However, unemployment was associated with a lack of CAR recovery ($F(1,32) = 6.92, p = .01, \eta_p^2 = .18$ see Figure 1).

Associations between SSS and stress measures

A series of hierarchical regression models were tested with age and sex entered first as control variables, followed by employment status and subjective status ladder rating (neighborhood and friends/family separately), and finally an interaction term for employment status-by-subjective status rating. These models were tested with self-reported perceived stress, CAR increase, and CAR recovery as outcome variables. Regression analyses (see Table 2) revealed that lower perceived status among friends and family was associated with higher perceived stress, regardless of employment status ($R^2 = .43$). Neighborhood status was not linked to perceived stress ($R^2 = .53$). Neither of the cortisol indices were associated with SSS ratings.

Discussion

Our findings suggest that the impact of employment status on SSS may differ depending on who participants compare themselves to. Neighborhood status but not friend and family status was lower among the unemployed. Interestingly, it was specifically friend and family status that predicted chronic stress. However, these status–stress relationships were the same for employed and unemployed individuals, suggesting that SSS compared to more proximal groups, specifically family and friends, may offer an important extension to the study of SSS as a health predictor.

Although not statistically significant, overall friends and family status trended toward being higher than status among neighborhood. However, unemployed individuals reported lower neighborhood status, a group close in physical proximity but not necessarily made up of close social contacts. Unemployed individuals may find that lack of income and job title are relevant factors in considering neighborhood standing. Although objective SES indicators have been identified as major SSS predictors (Singh-Manoux et al., 2003), it appears that unemployed may not focus on SES indicators in determining status among friends and family, suggesting that future studies may benefit from assessing close social contacts as a distinct facet of SSS.

Regardless of employment status, lower ratings among friends and family, but not neighborhood, were associated with more perceived stress. This study shows that even without explicitly describing the top of the ladder as those with the highest objective SES, subjective perception of having lower status than surrounding individuals is associated with elevated chronic stress. This link between stress and status among a previously untested group emphasizes the potential health impact of social standing among one's family and friends and demonstrates the value of a measure of very proximal SSS that captures influences of the closest people surrounding an individual.

Unemployed and employed individuals had comparable CARs; however, for unemployed individuals, this was followed by a lack of CAR recovery. This observation is consistent

with previous studies linking flatter cortisol slopes across the day and higher daily cortisol output with higher chronic stress (Miller et al., 2007). Similar to acute stress findings (McEwen, 1998), lack of cortisol recovery in a basal context may lead to elevated cortisol exposure and health risks consistent with exposure to chronic stress associated with unemployment (Mantler et al., 2005).

Limitations

A skewed gender distribution and differences in availability of government unemployment services reduce generalizability of the findings. Furthermore, associations between neighborhood status and perceived stress as well as subjective status and CAR recovery were not significant despite having medium effect sizes. Thus, it is too early to dismiss neighborhood SSS as a health-relevant domain of status. Finally, post hoc power analyses confirmed adequate power to detect large effects; however, the sample size does not allow for the detection of weaker relationships. Despite these limitations, the current findings provide promising first evidence that SSS differs in unemployed individuals and that it matters whom participants compare themselves to.

Summary and outlook

The current findings emphasize the health relevance of SSS among individuals in closer proximity—specifically friends and family. While unemployed individuals reported lower neighborhood status, there was no difference in status relative to family and friends, suggesting that lack of income and employment level may not be factors on which this type of status is based. Although SES plays some role in SSS ratings, these findings indicate that SES may not impact all domains of SSS equally.

Past research has demonstrated a gradient relationship between health and perceptions of one's standing in broadly defined social hierarchies, for example, United States. By assessing status among a large, generalized social group, this measure may not have adequate resolution to detect which domains of status are most health relevant. Identifying specific components of SSS and their distinct associations with stress will enable future research to target the most health-relevant facets of SSS for different populations.

Acknowledgments

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by NIGMS Brain-Body-Behavior Interface in Learning and Development Across the Lifespan training grant T32GM084907 (A.M.G.).

References

- Adler, NE; Stewart, J. The MacArthur scale of subjective social status. MacArthur Research Network on SES and Health – Psychosocial Notebook. 2007. Retrieved from <http://www.macses.ucsf.edu/research/psychosocial/subjective.php>
- Adler NE, Boyce T, Chesney MA, et al. 1994; Socioeconomic status and health: The challenge of the gradient. *American Psychologist*. 49(1):15–24. [PubMed: 8122813]

- Adler NE, Epel ES, Castellazzo G, et al. 2000; Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology*. 19(6):586–592. [PubMed: 11129362]
- Cohen S, Kamarck T, Mermelstein R. 1983; A global measure of perceived stress. *Journal of Health and Social Behavior*. 24(4):385–396. [PubMed: 6668417]
- Cundiff JM, Smith TW, Uchino BN, et al. 2013; Subjective social status: Construct validity and associations with psychosocial vulnerability and self-rated health. *International Journal of Behavioral Medicine*. 20(1):148–158. [PubMed: 22200973]
- Fries E, Dettenborn L, Kirschbaum C. 2009; The cortisol awakening response (CAR): Facts and future directions. *International Journal of Psychophysiology*. 72(1):67–73. [PubMed: 18854200]
- Goodman E, Adler NE, Kawachi I, et al. 2001; Adolescents' perceptions of social status: Development and evaluation of a new indicator. *Pediatrics*. 108(2):E31. [PubMed: 11483841]
- McEwen BS. 1998; Protective and damaging effects of stress mediators. *New England Journal of Medicine*. 338(3):171–179. [PubMed: 9428819]
- Mantler J, Matejcek A, Matheson K, et al. 2005; Coping with employment uncertainty: A comparison of employed and unemployed workers. *Journal of Occupational Health Psychology*. 10(3):200–209. [PubMed: 16060724]
- Marmot MG, Shipley MJ, Rose G. 1984; Inequalities in death-specific explanations of a general pattern? *The Lancet*. 1(8384):1003–1006.
- Miller GE, Chen E, Zhou ES. 2007; If it goes up, must it come down? Chronic stress and the hypothalamic-pituitary-adrenocortical axis in humans. *Psychological Bulletin*. 133(1):25–45. [PubMed: 17201569]
- Operario D, Adler NE, Williams DR. 2004; Subjective social status: Reliability and predictive utility for global health. *Psychology & Health*. 19(2):237–246.
- Ostrove JM, Adler NE, Kuppermann M, et al. 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(6):613–618. [PubMed: 11129365]
- Reitzel LR, Nguyen N, Strong LL, et al. 2013; Subjective social status and health behaviors among African Americans. *American Journal of Health Behavior*. 37(1):104–111. [PubMed: 22943107]
- Singh-Manoux A, Adler NE, Marmot MG. 2003; Subjective social status: Its determinants and its association with measures of ill-health in the Whitehall II study. *Social Science & Medicine*. 56(6):1321–1333. [PubMed: 12600368]

Figure 1.

Employment status differences in subjective social status ratings (means and standard errors; left) and cortisol awakening responses (means and standard errors; right).

Means $\pm$ standard deviations (min-max) for subjective social status ratings for friends and family > employed: 7.67 ± 1.37 (5–10), unemployed: 6.94 ± 2.01 (2–10); for neighborhood > employed: 7.39 ± 1.79 (2–10); unemployed: 6.00 ± 2.20 (1–9).

Table 1

Participant characteristics.

	Employed (mean $\pm$ SD)	Unemployed (mean $\pm$ SD)	Test statistic	<i>p</i> -value
Age (years)	31.6 $\pm$ 8.3	35.1 $\pm$ 9.8	1.16	.26
BMI (kg/m ²)	22.6 $\pm$ 3.8	22.2 $\pm$ 3.9	0.37	.72
Smoking (Y/N)	5/13	6/12	0.11	.74
Regular medication (Y/N)	5/13	9/9	8.70	.28
Chronic diseases (Y/N)	9/9	10/8	0.11	.74
GHQ score	19.9 $\pm$ 3.7	16.9 $\pm$ 3.3	2.52	.02
Marital status (1/2)	16/2	8/10	3.12	.004
Education (1/2/3)	0/10/8	2/10/6	2.42	.49
Monthly family income	7.2 $\pm$ 1.2	3.2 $\pm$ 1.5	8.68	<.001
Perceived financial position	2.7 $\pm$ 1.0	4.8 $\pm$ 0.7	7.23	<.001

SD: standard deviation; BMI: body mass index; Y/N: Yes (1) or No (0); GHQ: General Health Questionnaire.

Marital status: 1 = Married, 2 = Unmarried; Education: 1 = some college or less, 2 = college degree, 3 = graduate degree; Income (in Euro): 1 = <250, 2 = 250–500, 3 = 500–750, 4 = 750–1000, 5 = 1000–1250, 6 = 1250–1500, 7 = 1500–2000, 8 = >2000; Perceived financial position: 1 = very good, 2 = good, 3 = satisfactory, 4 = sufficient, 5 = poor, 6 = catastrophic.

Table 2

Regression analyses assessing the role of employment status-dependent effects of subjective social status on stress (perceived stress, basal cortisol indices).

	<u>DV: Perceived stress</u>		<u>DV: CAR increase</u>		<u>DV: Cortisol slope</u>	
	β	<i>p</i>	β	<i>p</i>	β	<i>p</i>
Neighborhood status						
Age	−0.17	.20	0.37	.04	0.20	.04
Gender	0.33	.03	0.04	.85	1.80	.37
Employment status	−0.27	.09	−0.19	.57	3.56	.08
Subjective status	−0.29	.11	0.09	.71	0.25	.64
Employment status × Subjective status	−0.29	.11	0.04	.88	0.54	.54
Friends and family status						
Age	−0.14	.35	0.36	.05	0.33	.05
Gender	0.14	.35	0.11	.56	0.24	.16
Employment status	−0.44	.009	−0.01	.98	0.39	.03
Subjective status	−0.37	.04	−0.20	.34	0.32	.11
Employment status × Subjective status	0.06	.74	−0.07	.76	−0.09	.65

CAR: cortisol awakening response; DV: dependent variable.