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ORIGINAL ARTICLE

Subjective socio-economic status predicts self-rated health irrespective of objective family socio-economic background

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Abstract

Aim: Subjective appraisals of socio-economic status (SES) are robustly associated with health outcomes, even when controlling for objective SES. Is this because objective SES is not accounted for in a sufficiently exhaustive way? *Methods:* I pool eight waves of nationally representative survey data from Germany (German General Social Survey, 2004–18, *N*=13,557) to assess the association between two separate subjective appraisals of SES (a 10-point scale and subjectively chosen social class membership) and poor self-rated health using logit and linear probability models. I account for an exhaustive range of objective SES variables, including respondents' household incomes and social status, as well as occupational status, social class and education of respondents and of their partners, fathers and mothers. *Results:* The association between subjective SES and poor self-rated health remains stable, even when accounting for a wide range of objective SES markers. This is true for both subjective SES measured on a 10-point scale and as a subjective class identification. ***Conclusions:*** **Even when controlling for a large number of objective SES markers, subjective SES and self-rated health are linked, suggesting that subjective assessments of SES are meaningful measures of SES which form a distinct pathway to health.**

Keywords: *Subjective social status, subjective socio-economic position, subjective social location, social determinants of health, self-rated health*

Introduction

Subjective socio-economic status (SES) is associated with health outcomes, over and above objective markers of SES [1]. This association is widely interpreted that subjective impressions about one's socio-economic situation affect one's health, irrespective of one's actual socio-economic situation. The association has intrigued researchers for good reason. Understanding how social inequalities 'get under the skin' is an important endeavour in improving population health. Broadly in line with the work of Wilkinson and Pickett [2], some suggest that subjective SES reflects one's relative rather than absolute position in the hierarchy of a society [1], and that perceiving inequality and subordination within such a hierarchy has damaging effects on health outcomes [3].

Subjective SES might also be a more precise measure of SES than objective SES measures, being the result of a 'cognitive averaging' process [4] that entails a self-assessment of an average of one's socio-economic resources. Respondents might draw on information that most data collections do not include, for instance information about one's partner or one's family background. Therefore, the association between subjective social status and health also has practical implications. Compared to other indicators of SES, subjective SES is easy to measure. Respondents are hesitant to report their incomes, leading to high non-response rates. Further, they are also not very good at reporting their exact income, leading to measurement error. Respondents are better at reporting their occupations. Yet, coding them in

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an accurate fashion is a laborious and expensive endeavour. Education can be more straightforward, but not under all circumstances. Countries with complex educational systems such as the UK can make it difficult to classify degrees, leading to problems comparable to those when collecting information about occupation. Further, subjective SES is also relevant in special populations such as adolescents or prisoners [5]. Showing that subjective SES is an equally good or even better predictor of health than objective measures that are more costly to collect is an important step in creating more robust research on health inequalities.

This study asks if the subjective SES–health relationship remains robust after accounting for a wide range of objective SES indicators in a large representative German survey, and it makes several key contributions.

First, I go beyond existing studies by drawing on a number of different objective SES indicators, namely education, occupation, income and social status. For instance, Torssander and Erikson [6] showed that various dimensions of objective SES are independently related to health and might refer to different pathways linking SES and health. Indicators of objective SES are limited in most studies. Thus, any association between subjective SES and health might be due to only incompletely capturing objective SES.

Second, this study includes social status among its objective SES indicators. Most public-health research on the social stratification of health focuses on education, income and occupation, and neglects the dimension of social status. In contrast to such indicators, social status describes one's position in a hierarchy of social superiority, equality and inferiority among individuals, reflecting the 'social honour' attached to their attributes [7]. Such a hierarchy manifests itself in a network of social relations, particularly the more intimate ones – who is eating and living with whom. Thus, social status might be more meaningful to and more recognised by the social actors involved than other objective SES markers.

Third, this study draws on partner objective SES, another commonly neglected aspect in research on social determinants of health. For instance, one's partner's education has consequences for one's own health [8]. Next to partner education, this study also takes partner occupation into account.

Fourth, family background has important implications for later-life health, irrespective of one's later-life living conditions [9,10]. This study takes the occupation and education of both parents of the respondents into account. Finally, I draw on two different subjective appraisals of SES: the well-established 10-point ladder scale and a subjective class identification item.

Methods

Data: German General Social Survey

I analyse the German General Social Survey ('Allbus') [11], a biennial, academically driven multi-topic survey collected since 1980. Data collection is based on multi-stage random sampling to ensure a representative sample of the German population, and computer-assisted face-to-face interviews ensure data quality. Sample sizes are large for a general interest survey (N=3000–3500 respondents per wave). The survey contains a large number of SES variables and has thus often been used to study social mobility in Germany. Since 2004, the survey contains a question on self-rated health. I pool all survey waves from 2004 to 2018 [11,12]. The large sample size allows me to account for a large number of inter-correlated predictor variables, namely SES indicators.

Variables

My outcome variable, self-rated health, was probed with the question 'How would you describe your health in general?', and responses were recorded on a five-point scale, ranging from 'very good' to 'bad'. The two worst response options, 'poor' and 'bad', were collapsed to indicate poor health (1), all other valid responses were counted as good health (0). Self-rated health is a general assessment of one's health status, not connected to any specific illness but covering largely physical and functional aspects of health, and is often used in public-health research [13,14].

Subjective SES was measured with the question 'In our society, there are groups which tend to be towards the top and groups which tend to be towards the bottom. Below is a scale that runs from the top to the bottom. Where would you put yourself on this scale?' Respondents were presented a ladder with rungs assigned numbers from 1 to 10, where 1 indicated the bottom and 10 the top rung of the ladder. Evans and Kelley [15] stress the convenience of the item, pointing to (a) the simple abstract structure of the question, facilitating comparability across countries; (b) the problems that would arise if respondents have to force themselves into a restricted, pre-assigned class-scheme; and (c) its avoidance in many countries of politically charged terms such as 'middle class' or 'working class'.

Subjective social class, my second measure of perceived SES, was measured by the question 'What class would you describe yourself as belonging to?', with five response options: 'lower class' (0), 'working class' (1), 'middle class' (2) and 'upper middle class' which I pooled with the only sparsely populated 'upper class' response (55 cases), yielding an 'upper middle/upper class' (3) category.

Education was recorded using the ISCED-1997 scale [16], distinguishing between basic (ISCED 1), lower (ISCED 2) and upper (ISCED 3) secondary, post-secondary (ISCED 4) and tertiary (ISCED 5–6) education. This information was obtained from the respondents themselves, and the respondents also reported this information for their spouse or partner, and for their father and mother.

Household income is the total net monthly income of the household, broken down into quintiles. Respondents were asked in an open question to report their total monthly income after deductions for taxes and social security contributions. In order to reduce item non-response, respondents who were unable or unwilling to report their income were presented with a list of 22 income brackets where they were then asked to locate themselves. For this analysis, I combined both variables by taking the midpoints of the income brackets and combining both variables to a continuous income variable. Income was equivalised by means of the modified OECD scale to adjust for differences in household composition. For those respondents who failed to report their income, I added an additional category to retain them for my analyses.

To assess occupational status, I used the International Socio-Economic Index of Occupational Status (ISEI) [17]. The ISEI gauges the status of an occupation as a weighted average of the mean level of earnings and education of an occupation. It ranges from 16 (e.g. farm hands, cleaners) to 90 (e.g. judges). Occupation was measured in the survey with great care to obtain correct information. Respondents were presented with a show card and two open-ended questions to elicit precise descriptions of all occupations of interest and to assign correct occupational codes. Respondents were asked to report their parents' occupations when they were 15 years old.

As a second occupation-based measure of objective SES, I used social class as measured by the European Socio-Economic Class scheme (ESeC) [18]. The ESeC distinguishes nine social classes based on employment relations, ranging from semi- and unskilled workers such as motor vehicle drivers to the higher salariat, for instance corporate managers. The class scheme can, however, not be understood as being fully hierarchical.

Social status was constructed in line with Chan [7], namely as the first dimension score from a correspondence analysis of a cross-table of husband's and wife's (or cohabiting partner's) occupation. Frequencies in the table reflect the relative distances in status between occupations. The result is one major stratification dimension with an ordering of occupations based on marriage and cohabiting patterns. The underlying assumption of the scale is that people associate with and marry their social equals. The social proximity of occupational incumbents is thus a measure of social status.

I further controlled for a number of variables, namely age and age squared, sex, survey year dummies (2004–2018), 16 dummies for each of the German federal states, as well as the interactions between state and year dummies.

Sample selection

I restricted the sample to respondents between the ages of 25 and 65 years, as I was interested in respondents who had already completed educational attainment and for whom the occupational measures of SES – social class and occupational status – have a salient meaning. Some respondents had missing information for some of the variables which was not due to item non-response. For instance, they had no partner, or their father was unknown, or their mother was not active on the labour market. This is indicated by dummy variables.

Modelling strategy

To model the outcome variable, I used logit models and report predicted probabilities as well as odds ratios. Predicted probabilities are obtained by marginal standardisation, as suggested by Muller and MacLehose [19], that is, predicted probabilities are summed to a weighted average reflecting the confounder distribution in the target population. I report substantively similar results from linear probability models as well as ordered logit and ordinary least squares (OLS) regression models of different specifications of the outcome in the Supplemental Material. The data analysed for this study are publicly available [11,12]. A Stata 15 do-file to replicate all analyses is available online [9].

Ethics approval

Given that this was a secondary analysis using data publiclyl available online, approval by an ethics review board was not required.

Results

The top row of Figure 1 presents descriptive statistics for the key variables poor self-rated health (Figure 1(a)) and subjective SES (Figure 1(b) and (c)). Respondents tended to report middling positions on the 10-point ladder, and the majority of respondents considered themselves working class. Figure 1(d)

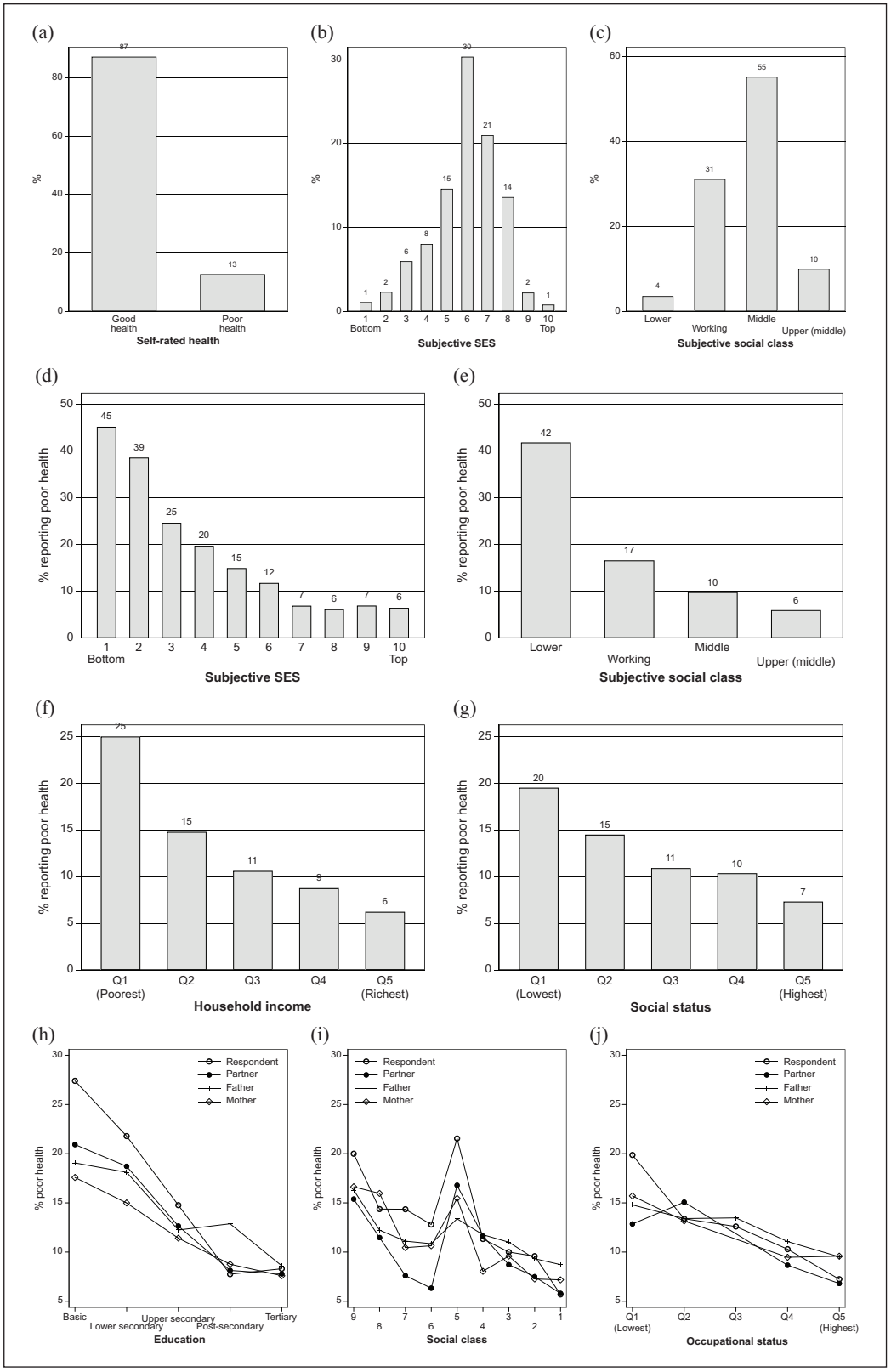

Figure 1. Descriptive statistics of data (N=13,557). (a)–(c) Frequency distribution of poor self-rated health, subjective SES and subjective social class. (d)–(j) Prevalence of poor health by subjective and objective SES indicators.

Notes: Social status in (g) and occupational status in (j) broken down into quintiles to aid data description. In subsequent analyses, the continuous forms of social status and occupational status are used. Social classes in (i): (1) higher salariat, (2) lower salariat, (3) higher-grade white-collar workers, (4) petit-bourgeoisie or independents (non-agriculture), (5) petit-bourgeoisie or independents (agriculture), (6) higher-grade blue-collar workers, (7) lower-grade white-collar workers, (8) skilled workers, (9) semi- and non-skilled workers.

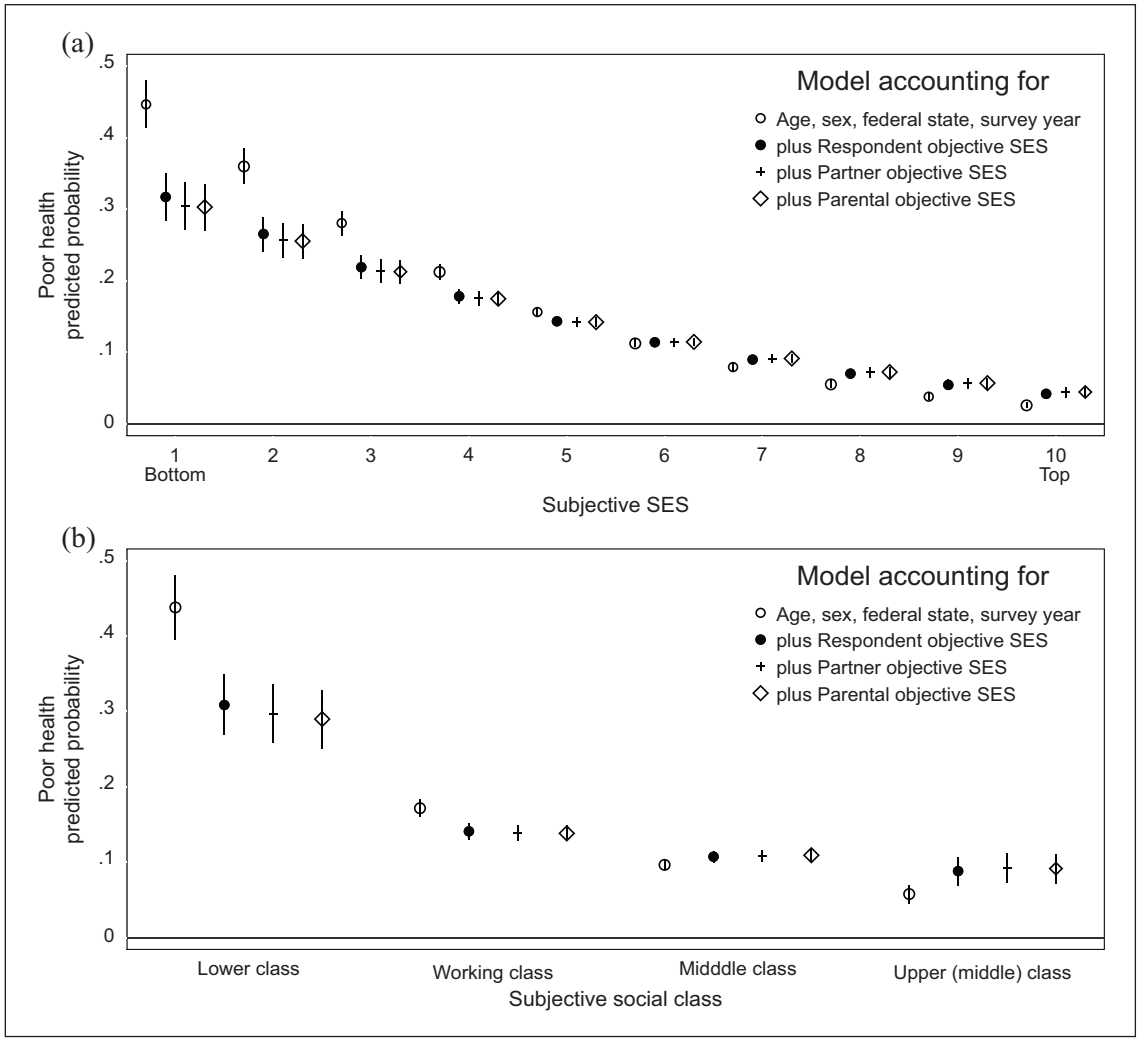

Figure 2. Predicted probabilities of reporting poor health by subjective SES (a) and subjective social class (b), accounting for different objective SES markers and control variables (N=13,538). Spikes denote 95% confidence intervals. Full models shown in Table A1 (for (a)) and Table A2 (for (b)) in the Supplemental Material.

and (e) show the social gradient in poor health according to the two subjective status markers. Irrespective of the measure, more than 40% of respondents reporting to be at the bottom of society or from the lower class rated their health as poor. Of those believing that they come from the top of society or from the upper-middle class, only 6% reported poor health, which is half compared to the overall sample (Figure 1(a)). The third and fourth rows of Figure 1 show the social gradient in poor health according to the objective SES markers. All indicators show clear gradients, with the partial exception of social class, which is not a strictly hierarchical indicator of SES, and where the small group of farmers in the middle of the scale reported the worst health. The fourth row of Figure 1 shows the social gradient by education, social class and occupational status, further broken down by respondents', partners' and parents' SES. Self-rated health is associated not only with one's own objective SES, but also with one's partner's and one's parents' objective SES. The role of one's own SES seems to play a bigger role at the lower end of the educational, class and occupational status spectrum, at the higher end, there is less variance in the importance of one's own, partner's and parents' SES for poor health.

Figure 2 shows the results from logit models predicting poor health in the form of predicted probabilities for reporting poor health by subjective SES (Figure 2(a)) and by subjective social class (Figure 2(b)). For both predictor variables, four models are presented. The first model includes the key predictor subjective SES or subjective class, as well as controls for age, age squared and sex, as well as survey year dummies, dummies for the federal states in Germany and interactions between years and states. The second

model adds objective SES variables pertaining to the respondent to the model: education, social class, occupational status, income and social status. The third model adds partner's objective SES: education, social class and occupational status. The fourth model adds parental SES: education, social class and occupational status for father and mother separately.

Two key findings emerge from Figure 2, consistent across both panels. First, both subjective SES and subjective class identification are correlated with self-rated health. The greater one's subjective status, the smaller is the probability of reporting poor health. With each additional point on a 10-point status scale, the predicted probability of reporting poor health decreases by about three percentage points. Second, this association remains largely stable once objective SES is taken into account. Even when comparing respondents with the same objective SES indicators and the same family background, the role of subjective SES stays largely the same. When looking at those respondents who consider themselves at the bottom of society, lower class or working class, there is some attenuation once objective SES is taken into account, but by and large, the pattern is unchanged. These findings are robust in alternative model specifications shown in the Supplemental Material, namely using linear probability models (Tables A3 and A4), using dummies for subjective SES (Table A5 and Figure A3), using ordered logit (Tables A6 and A7) and OLS regression models (Tables A8 and A9) for a five-category measure of self-rated health, and a different dichotomization of self-rated health (Tables A10 and A11 and Figure A4).

Discussion

Using large representative data of the German population, this study shows that subjective appraisals of one's SES predict self-rated health, above and beyond a large number of objective markers of SES. Having a lower appraisal of one's SES is associated with having poor health, irrespective of one's living conditions. The SES of a partner and one's parents do not affect the relationship between subjective SES and the probability of reporting poor health. This finding suggests that subjective measures of SES are useful measures of SES which capture important variance in health. Second, results support a direct pathway from subjective appraisals of SES to health, pointing to a substantive interpretation of subjective SES effects on health.

Subjective SES has been linked to health net of objective SES indicators. Evidence for this finding comes from many countries [20], draws on various health outcomes such as self-reports [21], biomarkers [22–24], health behaviours [25] or mortality [26] and is robust across different research designs [27–29]. Indicators of objective SES are, however, limited in most studies, raising the question of whether any association between subjective SES and health is due to incomplete measurement of objective SES.

This study puts the subjective SES–health relationship on an empirically more solid basis, which is necessary according to Hoebel and Lampert's [1] literature review. The number of objective SES markers taken into account in this study is bigger than in any other study. Next to standard measures of objective SES such as respondent's education, income and social class, this study also takes into account social status, an often-neglected aspect of social hierarchy in research on the social determinants of health. Further, the study not only focuses on the objective SES markers of the respondents, but also takes into account the education and occupation of respondents' partners, fathers and mothers.

Two potential sources of endogeneity need to be acknowledged. I have no information about wealth [30]. While parental education and occupation capture some of that variation, as wealth is usually passed down the generations, this assumption has problems. First, large wealth might go unreflected in occupational measures such as occupation and salaries, as the truly wealthy might not be active on the labour market. Second, if wealth is being passed down the generations, accounting for the respondent's parents' SES potentially captures only half of the story, as the SES of the respondent's parents-in-law would be equally salient. This source of bias is, however, mitigated by the homogamy in partner choice: children of wealthy parents tend to marry children of other wealthy parents [31].

Further, I only have a self-reported health outcome, which potentially opens another avenue for confounding [1]. Both self-rated health and self-rated SES could be partially driven by some personality trait, such as a negative mind-set, which would confound the relationship between the two. While I cannot completely rule this out, two things can be said against an extreme position that would attribute the link I found to common measurement variance. First, research has shown that SSS is also related to non-self-reported health outcomes [23]. Second, a randomised experiment has shown that the relationship between subjective SES and self-rated health was unrelated to negative mood [32]. This gives confidence in my findings, despite the weaknesses. Nonetheless, future research will benefit from accounting for wealth in the study of subjective SES, as well as drawing on non-self-reported health outcomes such as biomarkers.

The main finding of this study – subjective SES predicting health, even when comparing only those

with a similar family socio-economic background – weakens the argument put forward in the 'cognitive averaging' thesis that subjective SES is only a more comprehensive measure of objective socio-economic circumstances. Instead, it is in line with a substantive interpretation of the subjective SES–health association, namely that low subjective SES is an indicator of relative deprivation, which leads to negative emotions and permanent stress [33]. Better understanding how subjective SES and stress – both exposure to stressful events and subjective perceptions of stress exposure – are linked will lead to important advances in the study of health inequalities.

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Declaration of conflicting interests

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

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