

An Odd Ladder to Climb: Socioeconomic Differences Across Levels of Subjective Social Status

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Abstract Subjective social status (SSS), a promising measure of social class or standing, is linked robustly to diverse indicators of mental and physical well-being. However, the processes behind SSS remain poorly understood. Socioeconomic status (SES; e.g., education, income, or occupation) is among the strongest predictors of SSS, but when and how much does SES matter for understanding differences between given SSS ranks? Drawing on multiple years of national US data (2010–2014 General Social Survey), I show that a quartic form closely describes relationships between SSS and SES: namely, education, income and occupational attainment increase at the bottom of the SSS ladder (between rungs 1–2 and 3) and before the top (between rungs 5–8), increase more modestly (“plateau”) across other ranks, and decrease markedly at the very top (across rungs 9–10). Auxiliary data on wealth accumulation among older Americans (2005 National Survey of Midlife Development in the United States; MIDUS) replicate the quartic form for education and occupation while also suggesting that high personal net worth (e.g., millionaire status) may help to explain why individuals assign themselves to the very top of the ladder despite holding less education, income or occupational prestige relative to others who rank just below. Additional multinomial analyses showed how probabilities of occupying specific rungs of the SSS ladder shift across levels of SES, confirming that the very top of the ladder is more responsive to gains in personal net worth than to traditional SES measures.

Keywords Subjective social status (SSS) · Socioeconomic status (SES) · Education · Income · Occupation · Wealth

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1 Introduction and Background

Subjective social status (SSS) is linked positively to diverse measures of mental and physical well-being. SSS involves presenting individuals with a social rank order of some kind, often a ladder, and then asking individuals to place themselves at the level that they think best describes their own standing within a given society or community (e.g., Adler et al. 2008; Singh-Manoux et al. 2003; Wolff et al. 2010). Across numerous studies, SSS predicts a host of mental and physical health outcomes even after controlling for objective socioeconomic status (SES) indicators such as education, income, or occupation (e.g., Adler et al. 2008; Demakakos et al. 2008; Ghaed and Gallo 2007; Präg et al. 2016; Scott et al. 2014; Singh-Manoux et al. 2005).

In many ways, SSS holds great promise as a streamlined and effective measure of social status. It offers a viable and easier alternative to traditional socioeconomic status measures such as occupation or income, which may require detailed questions or may suffer from reporting issues or bias. Meanwhile, SSS offers a way of capturing social status in situations where objective or locally meaningful markers of status may be comparatively difficult to locate, define, or measure, such as in adolescent populations, indigenous populations, or stigmatized or marginalized social groups. Finally, because status is influenced by numerous distinct processes beyond traditional socioeconomic standing measures, SSS holds appeal in that it seems to be influenced by extraneous factors such as neighborhoods, experiences, social capital or networks, or intergenerational transfers or wealth holdings, all of which may arguably factor into one's social standing just as much as traditional SES.

Because SSS holds such considerable promise, researchers have expended a lot of effort trying to shed light on the multiple processes by which individuals may think about and assign themselves to SSS ladder ranks. For instance, researchers have inquired after the unique personal, psychosocial or cultural factors that may be driving variation in subjective status (e.g., Nielsen et al. 2015; Quon and McGrath 2014; Reitzel et al. 2010; Singh-Manoux et al. 2003). While much knowledge has been gained by examining how diverse factors such as acculturation, social networks, school performance, peer nominations, neighborhood quality or workplace efficacy predict social status, for example, these factors and others often are secondary to objective SES in explaining SSS variation.

Indeed, despite all this added inquiry, objective SES indicators such as education, income, or occupation remain among the strongest known predictors of SSS. While it is true that SSS was designed in part as an attractive and perhaps more encompassing alternative to traditional SES measures, SSS still is intended to tap objective socioeconomic variation to some extent. Therefore, gaining a closer understanding how SES and SSS are related may still help researchers to better understand in what senses SSS departs from SES and in what ways it actually closely tracks with SES. Very little is known about when and how SES matters for defining differences between rungs on an SSS ladder. Persistent gaps in knowledge regarding how SES and SSS are related are not trivial, as they bear on the fundamental and longstanding issue in the SSS literature of how individuals actually understand what it means to move up a ladder or social rank order (e.g., Nielsen et al. 2015; Singh-Manoux et al. 2003).

While a large number of studies have focused on the determinants of SSS, these studies almost always examine average associations between SES and SSS, thus obscuring how SES may matter differently across particular regions or rungs of the ladder relative to others. In rare cases where SSS is measured using qualitative categories rather than

numbered rungs or steps, the opportunity to examine formal relationships between SES and SSS has been overlooked (e.g., Wolff et al. 2010). Some cognate research examines subjective class identification, defined broadly as whether individuals see themselves as working class, middle class, or upper class (e.g., Jackman and Jackman 1973; Speer 2016). This work often estimates associations between objective measures such as education or income and whether individuals classify themselves subjectively into certain class categories. Following the classic Marxian dichotomy of *Klasse an sich* and *Klasse für sich*, Laumann and Senter (1976:1307) posit that “one must ultimately treat the interrelationships of the two sets of problems [objective and subjective social class] in order to construct a comprehensive explanation of a society’s system of stratification.”

Overall, while correlations between SSS and SES are examined in virtually every published study on SSS, these correlations do not bear on key questions of how or when SES matters for movement up particular ranks or segments of a social ladder or rank order. Status in modern communities and societies is distributed very unequally by resources or objective socioeconomic holdings, with incremental increases in earnings or resources garnering less rank gain at the top of status hierarchies than at the bottom where resources are scarcer and smaller differences matter more for distinguishing ranks between individuals (e.g., Bloome 2015; Gould 2002; Piketty 2013). People are subjectively well-aware of the disproportionate income or wealth held by a select few individuals in society, and of the status that gets accorded to gains in income or wealth at different points in income or wealth distributions (Wilkinson and Pickett 2006). Thus, constraining the importance of SES to be equivalent across all regions of the SSS ladder, as is common practice, ignores the reality of how individuals perceive or understand the relationship between SES and social status on an everyday basis. Most individuals when asked fully recognize how common it is to hold a certain level of education, to make a certain income, or to hold a certain occupation in their own society, and this social awareness arguably is what produces strong correlations between SES and SSS in the first place, yet the nature of these correlations remains glossed over.

Therefore, estimating an average association between SES and SSS, as is routine practice in studies of SSS, is fine for descriptive purposes but it almost certainly masks wide variation in SES changes across different segments of the social rank order. If, for example, educational or income differences are negligible between two given rungs of the ladder but very large between two other rungs, this would imply that the “ladder” is to be understood more aptly as a warped structure or uneven set of steps, where some steps are harder to climb than others, and some steps are more closely linked to certain aspects of objective SES than others. At lower regions of the ladder, where fewer resources separate those who are one rank higher, fewer objective resources may be required to reach the next rank. However, as one moves up the ladder, rungs may become harder to ascend, in terms of requiring more years of education, a greater jump in income, or more of a substantial increase in occupational prestige, for example. While reasonable, these propositions have not received formal examination using national data.

A handful of studies have examined complex associations between SES and SSS not restricted to ladder-wide averages or linear forms. However, this research has been conducted at the aggregate, not individual, level. Scott et al. (2014) tabulated country income group against each rung of the SSS ladder, revealing complex nonlinear relationships between objective country-level resources and distributions of subjective social status. Landefeld et al. (2014) drew on interventional data, showing across two distinct SSS measures that frequency distributions of SSS differ considerably depending on whether factory workers are paid a living wage. While these studies and others suggest that

distributions of SSS vary in complex ways with objective SES, they do not examine individual-level variation and they do not reveal how associations between SES and SSS differ across ladder segments or ranks.

In some areas of the SSS literature, attention has shifted away from singular SES facets and toward composites of SES measures. In particular, some work has propounded the idea that individuals assign themselves subjective social status by performing a cognitive average of their objective socioeconomic holdings, with each of these objective facets receiving some degree of consideration (e.g., Andersson 2015; Hu et al. 2005; Nobles et al. 2013; Singh-Manoux et al. 2005). What ramifications does an averaging principle hold for understanding associations between SSS and SES? Might an average standardized SES score show the same statistical relationships with ladder score as particular facets of SES?

In this study I analyze data from the General Social Survey (GSS) to throw light on the correspondence between SES and SSS. The GSS is a longstanding US data instrument that recruits a nationally representative sample of Americans; I draw upon the most recent administrations of the GSS that offer a social ladder question (2010–2014). Across these survey years, I analyze education, income and occupation variation separating rungs of the ladder, so as to establish both the nature and magnitude of SES differences between SSS steps or rungs. I also examine an average standardized SES measure to assess whether relationships between SES and SSS may be dependent on cognitive averaging. Finally, I use auxiliary data on wealth accumulation in older Americans to examine whether personal net worth holds differing associations with SSS that may help explain unique patterns at the very top of the social hierarchy. In total, the analyses consistently point to a quartic form relating SES and SSS. In this form, there are two phases of marked increase in SES (between SSS rungs 1–2 and 3 and SSS rungs 5–8), two phases of lesser movement in SES, and one notable downturn in SES at the very top of the ladder (across SSS rungs 9–10). In contrast, wealth increases more uniformly across the entire SSS ladder.

2 Method

To examine socioeconomic differences across levels of subjective social status, the current study draws on the General Social Survey (GSS; publically available at norc.org). Conducted by the National Opinion Research Center (NORC) at the University of Chicago, the GSS is a nationally representative sample of the noninstitutionalized, English-speaking US population aged 18 or older. Begun in the 1970s, the GSS has been administered at least every other year with response rates of 70–82%. In this study I focus on the most recent GSS survey years conducted after the Great Recession (2010, 2012 and 2014), yielding a total multi-year sample of $N = 6556$ (annual N s range from about 2000–2500). Education was queried in all three recent surveys (<1% nonresponse), as was household income (10% nonresponse) and general occupational classification (6% nonresponse). Occupational prestige score was reported in the years 2012 and 2014 ($N = 4512$, 5% nonresponse).

2.1 Subjective Social Status (SSS; Perceived Social Rank)

In the GSS, respondents were told, “In our society there are groups which tend to be towards the top and those that are towards the bottom. Here we have a scale that runs from top (1) to bottom (10). Where would you put yourself on this scale?” Because this question

explicitly mentions a social rank ordering, it is similar to many published SSS survey instruments (e.g., Präg et al. 2016; Wolff et al. 2010). Because very few respondents chose ranks 1 or 2, these ranks are combined for analyses. It is common practice to combine ranks in tabulations of SSS (e.g., Adler et al. 2008; Scott et al. 2014; Singh-Manoux et al. 2003). This has the advantage of illuminating trends more robustly when few members occupy certain ladder ranks. Alternatively, keeping ranks 1 and 2 separate during analyses still yields the same overall conclusions regarding quartic functional form.

2.2 Measures of Objective or Traditional Socioeconomic Status

2.2.1 Education

Respondents reported how many years of formal education they had completed, ranging from 0 to 20. The respondent also specified the highest educational degree they had obtained by the time of the survey. Valid responses were less than high school diploma, high school diploma, junior college, Bachelor's degree, and graduate degree.

2.2.2 Income

The respondent selected an income bracket that best corresponded to the last year's earnings for their household (ranging from less than \$1000–\$150,000 or over). Because some brackets on this measure are wider than others, I recoded all brackets to their midpoint values (e.g., \$40,000–\$49,999 bracket is recoded to \$45,000). Because the GSS income measure is right-censored at the 92nd percentile of reported earnings (\$150,000 or more; top-coded at \$160,000), it exhibits a density distribution that is not severely skewed, as is often seen for less censored (or uncensored) income measures. Thus, for ease of interpretation, I analyze income in thousands of raw dollars rather than transforming it (e.g., using the natural logarithm of earnings). Substantive findings do not differ, and normality does not markedly improve, when GSS income is transformed.

2.2.3 Occupation

Meanwhile, the respondent also reported their most recent occupation, which GSS converted into a prestige score using the standard socioeconomic index (SEI) of occupations (Nakao and Treas 1994). In auxiliary analyses I also treat occupation as professional/managerial occupation versus all other basic occupational groupings, allowing me to use all three GSS survey years.

2.2.4 Average Socioeconomic Status

I converted each objective SES measure to a standardized score and then converted standardized scores to cumulative normal probabilities for ease of interpretation (range 0–1, noninclusive). Average socioeconomic status is calculated here as the equally weighted arithmetic average of normalized education, income, and occupation. While cognitive averaging models do not necessarily assign equal weights to different aspects of socioeconomic status, this average measure nonetheless allows a test of whether SES and SSS link differently under a more complex multifactorial measure of SES. The SES measures once normalized (so all SES facets have range 0–1) correlate at $r = 0.456\text{--}0.582$,

with Cronbach's $\alpha = 0.751$. Meanwhile a principal component analysis yields just one component, with eigenvalue = 2.007.

2.2.5 Demographic Characteristics

Sex is a binary indicator (male or female) and race is two binary indicators, for black or African-American and other non-white race. Respondent age at survey is recorded (18–89 years). Additional analyses confirmed that functional forms relating SES to SSS do not differ by gender.

2.3 Analytic Strategy

The analysis begins with a descriptive tabulation of objective SES across SSS ranks. This reveals in broad terms how SES varies across different portions of the SSS rank order in the GSS data.

Preliminary analyses then used non-parametric smoothing (LOWESS; locally weighted scatterplot smoothing) in order to suggest functional forms relating SES and SSS. With respect to SES, LOWESS visualizations across all traditional SES measures showed two characteristic plateaus and one final dip at the top of the ladder, suggesting that SES changes across the SSS ladder may be best captured parametrically by a quartic (fourth-order) polynomial regression equation, which accommodates three local minima or maxima.

Next, regression models serve to test the significance and fit of functional forms linking SSS and SES, while controlling for survey year and demographic characteristics. These regressions are used for purposes of generating adjusted predictions and verifying the significance and extent of polynomial fit, not for proposing or testing causal ordering between SES and SSS. A series of functional forms linking SSS to SES is fitted, beginning with a common linear approach and then proceeding to quadratic, cubic and quartic. In additional models (not shown), fractional polynomials and rank-specific models also were fitted. Fractional polynomials empirically determine the optimal exponents and number of power terms linking predictors and outcomes. A rank-specific model specifies an indicator for each individual rank and thus makes no assumptions about overall functional forms of SES across levels of SSS. However, fractional and rank-specific models led to the same overall conclusions concerning essentially quartic form, and tended to perform worse on BIC (Bayesian Information Criterion) non-nested model comparison tests relative to the linear or quartic models shown here.

The models reported herein show the best fit according to BIC (Bayesian Information Criterion; Raftery 1995) and also show statistically significant power terms (SSS^2 [quadratic], SSS^3 [cubic], and/or SSS^4 [quartic]). Marginal adjusted predictions from these models are plotted with 95% confidence bands. These predictions are generated via *margins* and then visualized using *marginsplot* in Stata 14; confidence bands are calculated using the delta method (Long and Freese 2006). Estimating models separately by survey year produced the same results regarding functional form.

A second series of regression models (not shown), in which SSS was regressed on SES (education, income, occupation, or average standardized SES) using linear through quartic specifications of SES, confirmed that SSS is more predictive of SES than vice versa. Adjusted R^2 for models of SES regressed on SSS was 41–71% greater compared to corresponding models of SSS regressed on SES. Therefore, it is more empirically informative to show how SES varies across SSS rather than vice versa. However, additional analyses using multinomial regressions, overviewed later, provided additional information regarding how SES predicts movement across different segments of the SSS ladder.

3 Results

Table 1 displays overall descriptive statistics for the 2010–2014 GSS sample. On average, respondents placed themselves at a rank of about 6 out of 10 on the GSS social ladder question ($SD = 1.791$). Approximately 6% of respondents selected a rank of 1, 2, or 3; about 19% selected 4 or 5; 38% selected 6, 27% selected 7 or 8, and 10% selected 9 or 10. In terms of traditional SES measures, GSS respondents had some college education on average (Mean years = 13.56, $SD = 3.08$), an annual household income of \$57,645 ($SD = \$45,479$), and an occupational prestige score of 46.09 ($SD = 22.67$; range = 9–92.8).

3.1 Relationships Between SES and SSS

Table 2 summarizes traditional SES measures by social ladder ranking. Here, SES generally increases noticeably across the bottom of the ladder (ranks 1–3), increases less on average across the middle (ranks 3–6), increases sharply from rank 6–7, and then continues to increase across ranks 7–8, before plateauing (rank 8–9) and then dipping down substantially from rank 9 to rank 10. There are slight exceptions to this general trend, in terms of patterns of increase or decrease beginning one rank earlier or later than mentioned above. But generally the correspondence between SES and SSS follows this complex nonlinear pattern. An important exception is the negligible difference in occupational prestige between rungs 1–2 and rung 3. After demographic and survey year adjustment, this difference becomes more substantial, as shown in the occupation panel of Fig. 1. Because this complex pattern has two regions of relatively steep increase (ranks 1–2 to 3; ranks 6–8), two regions of more modest increase (ranks 3–6) or plateauing (rank 8–9), and one region of decrease (ranks 9–10), it intuitively recommends a quartic functional form.

Formal comparisons of models revealed a quartic form with four SSS parameters (SSS, SSS^2 , SSS^3 , SSS^4) to be preferred across all facets of SES in the 2010–2014 GSS, including average standardized SES. Table 3 summarizes parameter estimates from the quartic regressions for education, income, occupation and average standardized SES. The quartic term achieves statistical significance for all models ($p < .001$).

Figures 1 and 2 plot the marginal adjusted predictions from these quartic models. These figures, which adjust for demographic characteristics and GSS survey year, document predictions that closely resemble the descriptive trends reported in Table 2. Namely, the

Table 1 Descriptive statistics (2010–2014 General Social Survey)

	M	SD	Min	Max
<i>SSS measure: society</i>				
Subjective social status	6.24	1.79	1	10
<i>Objective SES measures</i>				
Education (Years)	13.56	3.08	0	20
Household income ($\times \$1,000$) ^a	57.65	45.48	0.5	160
Occupational prestige (SEI ^b)	46.09	22.67	9	92.80
Average standardized ^c SES	0.48	0.24	0.000	0.99
<i>Demographic variables</i>				
Age	48.19	17.51	18	89
Female	0.55	0.50	0	1
Race: black	0.16	0.36	0	1
Race: other non-white	0.10	0.30	0	1

Ns = 4114 to 6269

^a GSS household income measure is right-censored (cap = \$150,000 or higher, coded to \$160,000)

^b SEI socioeconomic index

^c Education, income, and occupation are standardized and then converted to a cumulative normal probability for ease of interpretation (0–1, noninclusive)

Table 2 Mean levels of traditional SES measures, by subjective social status (2010–2014 General Social Survey)

Subjective social status (Society) (% of respondents at given rank)	1–2 (2.41%)	3 (4.07%)	4 (8.01%)	5 (10.96%)	6 (37.95%)	7 (14.31%)	8 (12.60%)	9 (3.59%)	10 (6.11%)
<i>Traditional SES measures</i>									
Education (Years)	11.30	12.48	12.67	12.97	13.20	14.47	14.98	15.30	13.51
Household income	23.31	35.26	40.29	45.39	54.33	70.94	79.75	83.40	57.48
Occupational prestige (SEI)	34.18	34.65	39.65	41.48	43.29	53.57	56.74	55.39	47.38
Average standardized SES	0.29	0.35	0.39	0.42	0.45	0.56	0.62	0.63	0.48

Means are calculated within given ladder ranks

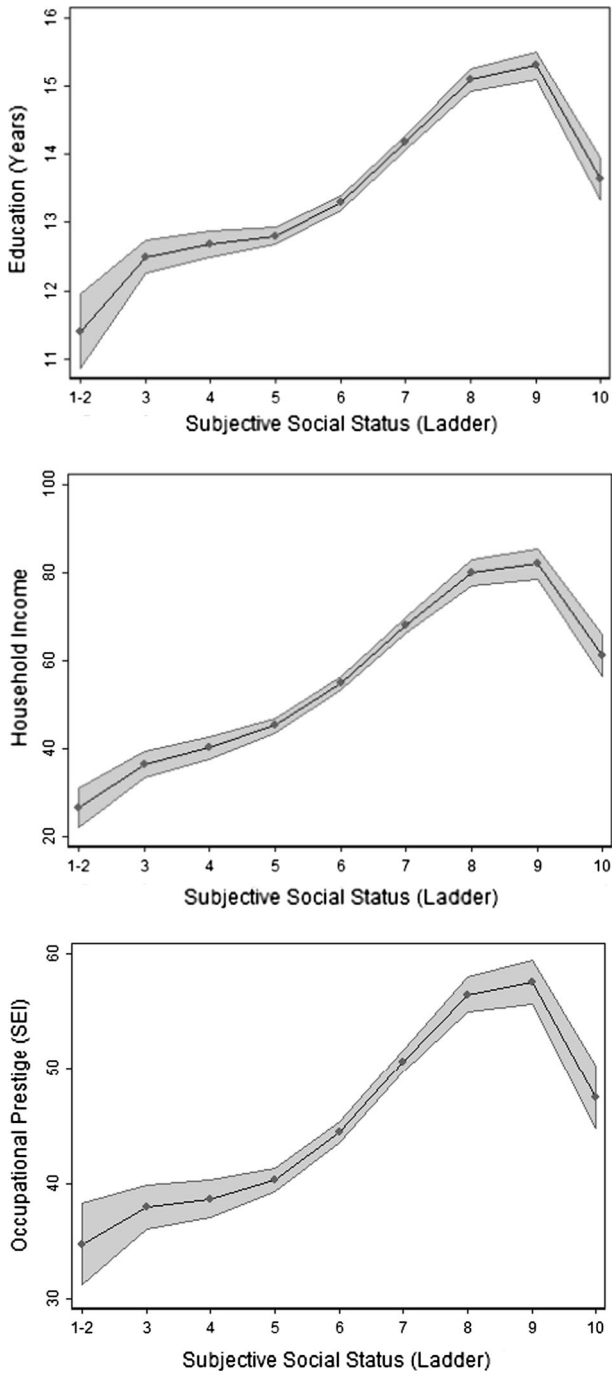


Fig. 1 Marginal associations of SSS and SES (with 95% Bands; 2010–2014 GSS)

largest differences in SES usually are observed from rungs 1–2 to rung 3 and from rung 5 to rung 8; elsewhere SES differences generally are smaller. There is a prominent dip in SES from rung 9 to rung 10.

3.2 Auxiliary Analyses: Substantive Specifications of Traditional SES Measures

The analyses conducted above constrain traditional SES measures to linear forms. To examine robustness to this constraint, additional analyses of education, income and occupation involved binary variables representing key substantive cutoffs. Specifically, for education, receipt of high school diploma and four-year college degree were considered; for income, passing key benchmarks (median and 90th percentile); and for occupation, holding a professional or managerial occupation. Descriptive trends for these binary variables were examined across the entire SSS ladder, as in Table 2. These revealed patterns of change across ladder regions similar to those reported above. Further, statistical

Table 3 Parameter estimates for SSS equations (2010–2014 General Social Survey)

	Education (OLS)	Income (OLS)	Occupation (OLS)	Avg SES (OLS)
Subjective social status (SSS)–society	0.812*** (0.045)	12.716*** (0.696)	5.910*** (0.399)	0.077*** (0.003)
SSS ² (Quadratic SSS term)	0.189*** (0.028)	1.546*** (0.406)	0.890*** (0.237)	0.014*** (0.002)
SSS ³ (Cubic SSS term)	−0.044*** (0.004)	−0.640*** (0.061)	−0.322*** (0.036)	−0.004*** (0.000)
SSS ⁴ (Quartic SSS term)	−0.016*** (0.002)	−0.167*** (0.027)	−0.082*** (0.016)	−0.001*** (0.000)
Age	−0.013*** (0.002)	−0.074* (0.032)	0.118*** (0.020)	0.000 (0.000)
Female	0.104 (0.075)	−7.195*** (1.146)	−1.262 (0.673)	−0.017** (0.006)
Race: black	−0.582*** (0.099)	−19.714*** (1.426)	−8.017*** (0.884)	−0.091*** (0.008)
Race: other non-white	−1.021*** (0.165)	−9.048*** (1.997)	−2.577* (1.239)	−0.059*** (0.010)
Survey year: 2012	0.183 (0.095)	3.239* (1.441)		0.014* (0.007)
Survey year: 2014	0.319*** (0.089)	6.635*** (1.338)	−0.797 (0.680)	0.018** (0.007)
Constant	13.982*** (0.177)	73.016*** (2.617)	44.037*** (1.556)	0.519*** (0.013)
R ² (Adjusted)	0.097	0.133	0.105	0.150
N	6249	5658	4108	6253

SSS ranges from 1 to 10 and is mean-centered in quartic models. Coefficients are unstandardized regression estimates. Standard errors are robust. Occupational SEI was not queried in 2010

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed)

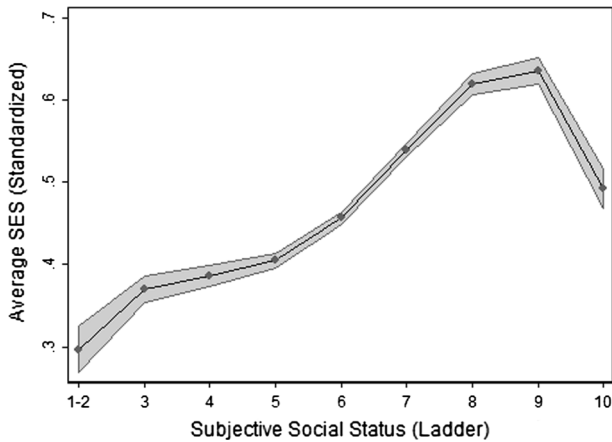


Fig. 2 Marginal association of average standardized SES with SSS (with 95% Band; 2010–2014 GSS)

comparisons of functional forms were carried out. These further analyses also upheld what is reported above: namely, quartic forms linking SES to SSS. Parameter estimates from the regression equations are given in Appendix Table 4.

3.3 Additional Dataset: Wealth Accumulation among Older Americans in the US

While the foregoing analyses have found a quartic form linking SSS to SES, which culminates with a sharp dropoff in education, income and occupation at the very top of the ladder (i.e. moving from rung 9 to rung 10), it remains unclear whether this quartic pattern is distinctive to the particular social ladder question administered by the GSS. This is an important issue to examine, given that subjective social status can be measured in terms of varying social reference groups. Moreover, it remains unclear whether unobserved socioeconomic holdings, measured by wealth accumulation or personal net worth, may offer a potential explanation for counterintuitive patterns at the very top of the ladder. Wealth accumulation may be considerably independent of educational or occupational attainment, such as through inheritance. Moreover, entrepreneurship or other wealth-accumulating activity may not be measured or predicted well by education or occupation.

The 2005 National Survey of Midlife Development in the United States (MIDUS) offers the opportunity to replicate the GSS findings in another dataset while extending them to include measures of personal wealth or net worth. Moreover, MIDUS asks a somewhat different version of a subjective rank or ladder question, one in which the respondent is shown a ladder and then asked to rank themselves on this ladder from 1 to 10 (referring to “standing in the community”) “relative to other people in the community with which you most identify.” Thus, relative to the GSS ladder question, the MIDUS question places less of an explicit emphasis on social power differences, and more of an emphasis on personally relevant social hierarchies. This makes for a useful contrast, as it is common practice to include societal and community ladder questions in the same empirical study for side-by-side comparison (e.g., Ghaed and Gallo 2007; Landefeld et al. 2014; Wolff et al. 2010).

In contrast to the GSS, MIDUS is a study explicitly designed with population aging in mind, as it oversamples older individuals in the US (see Radler and Ryff 2010 for more details). The mean respondent in the 2005 MIDUS is approximately 58 years old at survey;

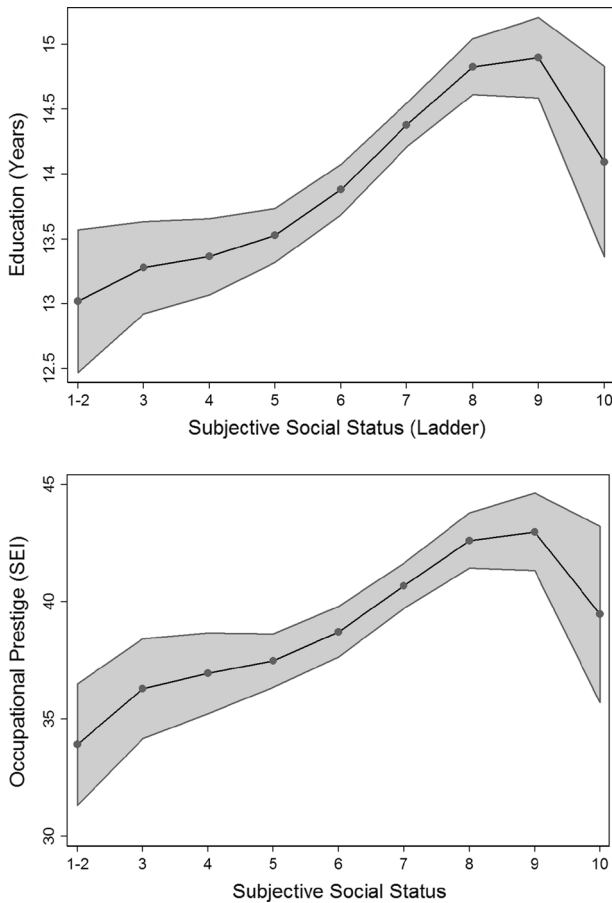
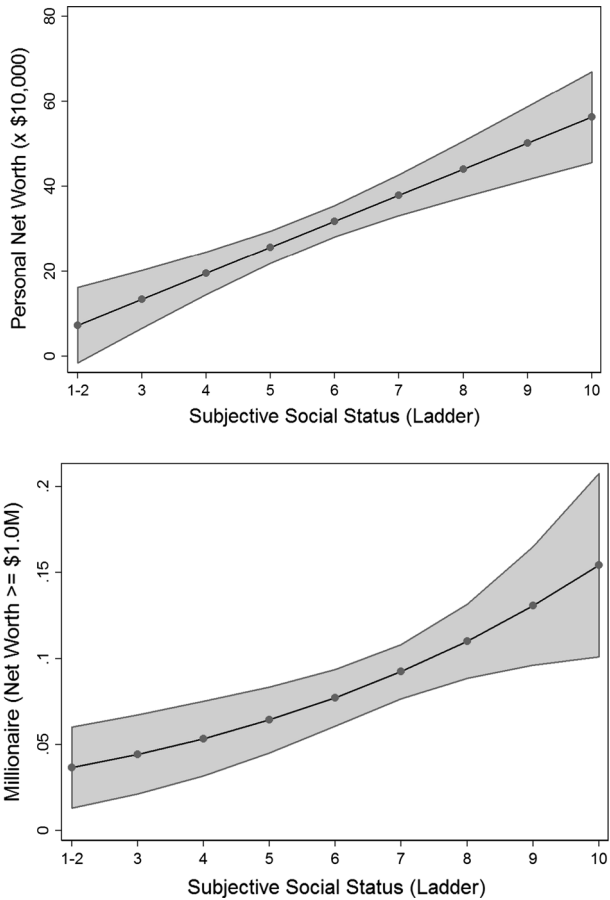


Fig. 3 Marginal associations of education and occupation with SSS (2005 MIDUS)

many respondents do not work for pay full-time. Therefore, I replicate the GSS analyses for education and occupation only. I also conduct a new set of analyses for personal wealth. Wealth is measured in MIDUS by having participants report on different categories of assets (e.g., stocks/bonds, retirement, savings, checking, homes or real estate, vehicles) and on any debts or liabilities (such as loans or mortgages). Debts then were subtracted from assets, and worth was set to zero by survey administrators for those respondents having negative net worth (10.9% of sample). For 21.6% of respondents, wealth was unavailable due to response refusal. Rates of nonresponse did not significantly differ across SSS ranks according to 95% binomial exact confidence intervals.

Figures 3 and 4 showcase the MIDUS results. As shown in Fig. 3, MIDUS yields a quartic relation between SES and SSS for education and for occupational prestige (SEI). Meanwhile, Fig. 4 reveals that personal wealth, in contrast to education, income, or occupation, accumulates *linearly* across ladder ranks, thus offering a potential explanation for status processes occurring at the very top of the ladder. Here personal wealth is depicted in terms of overall net worth ($\times \$10,000$) and millionaire status (personal net worth $\geq \$1.0$ M). For ease of interpretation, marginal adjusted raw personal wealth is depicted instead of log personal wealth.

Fig. 4 Marginal associations of personal net worth with SSS (2005 MIDUS)



Increased wealth across ladder rungs 9 and 10 may help explain the fact that individuals at rung 10 assign themselves higher status despite lower mean levels of education, income and occupational prestige. Corresponding descriptive statistics and model parameters are presented in Appendix Tables 5, 6 and 7. As shown in Appendix Table 7, log personal wealth demonstrates a linear relation with SSS (quadratic, cubic and quartic terms are not significant and do not improve overall model fit).

3.4 Alternative Analyses: Multinomial Logistic Regressions of Subjective Social Status

Alternative regressions were fitted in which SSS is treated as a multinomial outcome with ladder rank odds estimated with respect to the bottom of the ladder (ranks 1–2). Appendix Table 8 reports the corresponding incidence-rate ratio (IRR) estimates. Appendix Figs. 5, 6, 7 and 8 visualize predicted probabilities for specific SSS ranks across levels of socioeconomic status (based on the multinomial estimates in Appendix Table 8).

Overall these figures reveal that the very top of the ladder (Rank 10) is far less dynamic across SES relative to the other portions of the ladder. With this, they reveal that probability of selecting the uppermost SSS ladder rank (Rank 10) increases linearly across

deciles of net worth, which is in keeping with the findings from prior regression analyses regarding the functional form linking SSS and (high) net worth. These figures also reveal that probability trajectories and crossover points are somewhat different across GSS and MIDUS, perhaps attesting to the differing SSS question wording across these datasets and/or to their differing sample compositions.

3.5 Additional Control Variables: Personal, Household, Neighborhood, and Community

Further regression analyses implemented additional control variables. While it certainly is true that SSS is explained by a number of personal, household and community variables, these variables may also confound the relationship between SES and SSS, assuming that certain individual characteristics are unevenly distributed across SES and SSS. To test for any residual confounding, an extended set of covariates is used. In GSS I was able to implement controls for parental education, local population size (logged), number of children at home, and total household size across the 2010, 2012, and 2014 GSS. Not surprisingly these variables predicted SES or SSS individually but did not confound the relationship of SES and SSS. In MIDUS I implemented controls for subjective religiosity, neighborhood quality, noncognitive traits (Big Five personality measures), voluntary associations in the community, frequency of contact with family and friends, parental SES, number of children, and number of household members, again finding that many of these variables predicted SSS or SES individually but did not substantially explain the association of SES and SSS. In sum, across GSS and MIDUS, I found no evidence to suggest that adjusting for additional relevant variables changed the general conclusions of the analyses, regarding how SES and SSS are functionally interrelated.

4 Discussion

Subjective social status holds great promise for the efficient yet comprehensive measurement of social class. This study analyzes for the first time the complex patterns linking objective or traditional SES measures with subjective social status (SSS) rankings. While prior work has documented nonlinear associations between SSS and mental or physical health, or between SSS and certain population-level measures of SES, no research to date had rigorously analyzed the mathematical forms explaining how SES and SSS relate at the individual level. This is a vital oversight, given our limited knowledge on how individuals cognitively assign themselves subjective social rankings, and given the strong links between these subjective rankings and health and mortality. Because SES is among the strongest known correlates of SSS, paying closer attention to how SES and SSS relate allows a much firmer grasp on key outstanding questions in the SSS literature such as “What conceptually separates one ladder rung from the next?” and “Is it harder to move between some ladder rungs than others?” Knowing the answers to these lingering questions will throw light on what the ladders and subjective rank orders ultimately mean to individuals in American society.

Drawing on several years of national US data, this study found remarkably robust but also quite complex patterns linking SES and SSS. Across all basic objective measures of SES examined in this study (education, household income, and occupational prestige), a quartic form best explains how SSS and SES relate. In this form, there are two phases of marked movement, two phases of lesser movement or plateauing, and one downturn at the very top of the ladder. The upward phases are found in the bottom third of the ladder and

from the middle to the near-top, whereas plateaus are located between the bottom third and the middle and within the near-top. This quartic form also was observed for an average standardized measure of SES that took into account education, income, and occupation simultaneously. Thus, regardless of whether one assumes SSS movement is linked to particular SES facets or a composite across these facets, the quartic pattern is observed.

The quartic forms that held across all major facets of traditional objective SES were preferred over linear, quadratic or cubic forms, in part because of the sharp downturn in SES at the very top of the SSS social ladder measure. Auxiliary data on wealth accumulation among older Americans, provided by the 2005 MIDUS, shed additional light on socioeconomic processes at the very top of social ladders or rank orders. According to the descriptive and regression findings for MIDUS, a linear form is most useful for describing the relationship between SSS and personal wealth. This offers a potential explanation for why individuals may assign themselves a top ladder rank even when they rank substantially lower than their peers in terms of education, income, or occupation. Since MIDUS samples more on older individuals and is a longitudinal survey, it will be useful to replicate the wealth results using a representative national cross-section. However, additional analyses using response and attrition weights suggested that the linear form is robust to age or SES differences in longitudinal survey participation.

The present study importantly suggests a need to respecify conceptual models linking SES, SSS and health. A host of studies examining the net effects of SSS on mental or physical health after controlling for SES would be well-served by more carefully examining specifications of SES that most optimally fit relationships between SSS and SES and between SES and health, as these are likely to take nonlinear or polynomial forms. Similar to how well-being or health returns to objective SES measures such as education or income often are found to be nonlinear or to exhibit diminishing returns (e.g., Everett et al. 2013; Kahneman and Deaton 2010), so too may status returns to SES be conditional on ladder region or relative social status. Thus, taking into account complex nonlinearity on both sides of the relationship would lead to more accurate and suitable statistical adjustment procedures for estimating net associations between SSS and health outcomes in future research.

A number of other research directions are evident as well. The literature on subjective social status increasingly is paying attention to distinctions among different versions of a ladder or rank question, such as the scope of the reference group mentioned in the question (e.g., Ghaed and Gallo 2007; Landefeld et al. 2014; Wolff et al. 2010). Versions of the SSS question that do not mention SES correlate highly with those that do (Ghaed and Gallo 2007; Goldman et al. 2006).

However, variation in reference groups across SSS questions, or in whether questions explicitly mention education, income or occupation as a basis of ranking oneself within a group such as American society, may bear on the observed correlations and functional forms linking SES to SSS. Hecht's (2016) work reveals the quite unique reference groups high earners use to understand the worth and positionality of their own earnings, and as such social comparisons among elites remain beyond the scope of the GSS and MIDUS data but yet could offer new insights into potential functions relating SES to SSS when SES is extremely high (e.g., hundreds of millions of dollars in net worth). Gaining a more comprehensive knowledge base of the interrelations among SSS and SES will ultimately throw more light on how individuals think of ladders or ranking systems more generally with respect to their various objective resource holdings. Prior work also has revealed that subjective social status outcomes and assignment processes work differently across population or cultural groups defined by gender or race, nationality, geography, or ethnicity (e.g., Adler et al. 2008; Andersson 2015; Demakakos et al. 2008; Franzini and Fernandez-Esquer 2006; Präg et al. 2016). Therefore, relationships linking SES and SSS may also differ across these population groups.

Appendix

See Tables 4, 5, 6, 7, and 8 and Figs. 5, 6, 7 and 8.

Table 4 Alternative SES outcomes (logistic regressions; 2010–2014 General Social Survey)

	Education		HH income		Professional/managerial occupation
	<HS	College+	≤\$45 k	≥\$140 k	
Subjective social status (SSS)–Society	−0.438***	0.584***	−0.448***	0.659***	0.411***
SSS ² (Quadratic SSS term)	−0.083**	0.108***	0.002	0.108**	0.069***
SSS ³ (Cubic SSS term)	0.022***	−0.032***	0.017***	−0.030***	−0.023***
SSS ⁴ (Quartic SSS term)	0.008***	−0.009***	0.004*	−0.010***	−0.006***
Age	0.015***	0.001	0.006***	−0.005*	0.006***
Female	−0.042	−0.002	0.302***	−0.359***	0.006
Race: black	0.486***	−0.642***	0.931***	−1.133***	−0.676***
Race: other	1.053***	−0.113	0.463***	−0.225	−0.151
Survey year: 2012	−0.079	0.041	0.297***	0.203	0.212**
Survey year: 2014	−0.211*	0.081	0.084	0.387***	0.167*
Constant	−2.666***	−1.032***	−1.097***	−1.772***	−1.085***
Pseudo R ²	0.059	0.070	0.076	0.095	0.044
N	6255	6255	5658	6255	5914

SSS ranges from 1 to 10 and is mean-centered. Coefficients are unstandardized logistic estimates. Standard errors are robust

*** $p < .001$; ** $p < .01$; * $p < .05$

Table 5 Descriptive statistics (2005 MIDUS; National Survey of Midlife Development in the United States)

	M	SD	Min	Max
<i>SSS Measure: community</i>				
Subjective social status	6.505	1.857	1	10
<i>Objective SES measures</i>				
Education	14.098	2.644	4	20
Occupational prestige (SEI ^a)	39.661	14.414	7.13	80.53
Personal net worth (×\$10,000)	33.927	78.255	0	1000
Millionaire (net worth ≥\$1.0 M)	0.086	0.281	0	1
<i>Demographic variables</i>				
Age	57.692	12.687	30	84
Female	0.547	0.498	0	1
Race: black	0.050	0.218	0	1
Race: other non-white	0.034	0.182	0	1

Ns = 1726 to 1805, except for net worth and millionaire status (N = 1415)

^a SEI socioeconomic index

Table 6 Mean levels of traditional SES measures, by subjective social status (2005 MIDUS)

Subjective social status (Community) (% of respondents at given rank)	1–2 (3.22%)	3 (4.18%)	4 (5.88%)	5 (12.61%)	6 (19.28%)	7 (22.72%)	8 (21.37%)	9 (6.78%)	10 (3.96%)
Education	12.904	13.486	13.394	13.294	13.828	14.612	14.501	15.371	13.714
Occupational prestige (SEI)	32.976	36.617	36.562	35.839	39.181	41.221	41.885	45.142	38.265
Personal net worth ($\times \$10,000$)	12.158	15.655	18.276	23.829	25.574	34.287	48.329	53.853	58.845
Millionaire (net worth $\geq \$1.0$ M)	0.043	0.068	0.024	0.076	0.059	0.090	0.103	0.156	0.185

Means are calculated within given ladder ranks

Table 7 Parameter estimates for SSS equations (2005 MIDUS)

	Education (OLS)	Occupation (OLS)	Log net worth (OLS)	Millionaire (Logit)
Subjective social status- community (SSS)	0.506*** (0.072)	1.999*** (0.388)	0.198*** (0.023)	0.199** (0.065)
SSS ² (Quadratic SSS term)	0.039 (0.042)	0.253 (0.238)		
SSS ³ (Cubic SSS term)	-0.032*** (0.009)	-0.128** (0.048)		
SSS ⁴ (Quartic SSS term)	-0.006* (0.003)	-0.033* (0.016)		
Age	-0.024*** (0.005)	-0.066* (0.028)	0.016*** (0.004)	0.023** (0.007)
Female	-0.455*** (0.127)	-4.455*** (0.702)	-0.393*** (0.084)	-0.375 (0.199)
Race: black ^a	-0.370 (0.312)	-5.028** (1.625)	-1.449*** (0.164)	2.354* (1.017)
Race: other	-0.068 (0.346)	-1.384 (1.984)	-0.363 (0.231)	
Constant	15.078*** (0.256)	41.082*** (1.469)	0.392 (0.190)	-7.052 (1.135)
R ² (Adjusted) ^b	0.064	0.061	0.130	0.052
N	1694	1669	1347	1347

SSS ranges from 1 to 10 and is mean-centered in quartic models. Coefficients are unstandardized regression estimates. Standard errors are robust. *** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed)

^a In millionaire logit, this instead is an indicator for white racial status (vs. any non-white race)

^b In millionaire logit, this instead is Pseudo R²

Table 8 Incidence-rate ratios (IRRs) from multinomial logistic regressions of subjective social status (SSS) on Socioeconomic Status (SES)

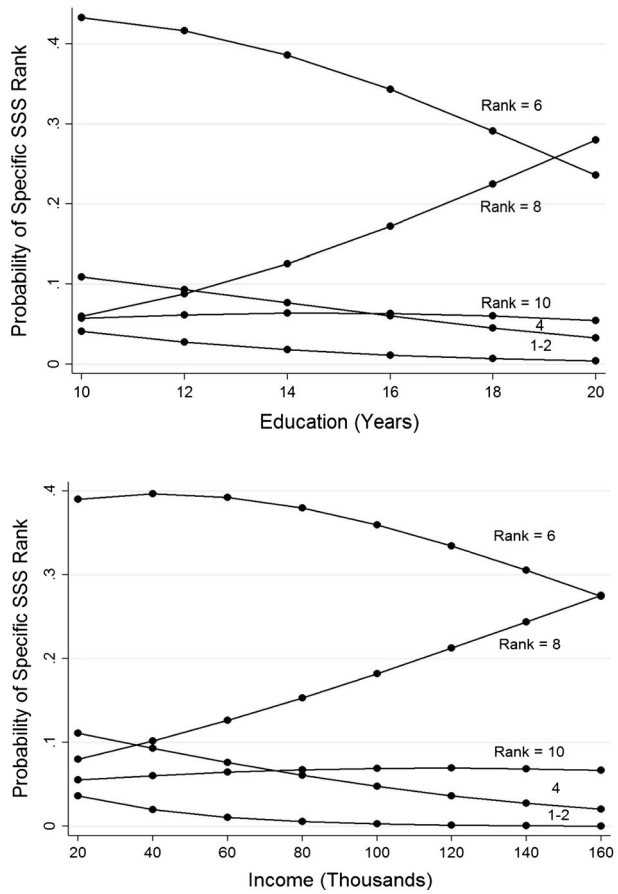
SSS rank	2010–2014 GSS				2005 MIDUS		
	Education (SSS Reference = Ranks 1 and 2)	Income	Occupation	Avg SES ^a	Education	Occupation	Net worth ^b
3	1.104***	1.017***	1.000	6.130**	1.117	1.024*	1.107
4	1.124***	1.022***	1.013**	18.215***	1.100	1.023**	1.074
5	1.161***	1.026***	1.016***	31.688***	1.077	1.018*	1.129*
6	1.196***	1.032***	1.020***	62.843***	1.202***	1.037***	1.209***
7	1.391***	1.040***	1.042***	551.571***	1.338***	1.044***	1.300***
8	1.487***	1.044***	1.048***	1520.194***	1.316***	1.048***	1.328***
9	1.549***	1.046***	1.044***	1980.163***	1.497***	1.064***	1.448***
10	1.264***	1.036***	1.031***	169.032***	1.213**	1.032**	1.335***

Regressions adjust for age, sex, race, and survey year (GSS). *** $p < .01$; ** $p < .05$; * $p < .10$

^a Average of normalized education, income, and occupation (Range = 0–1)

^b Decile of net worth

Fig. 5 Predicted probabilities of specific SSS ranks across levels of education and income: 2010–2014 General Social Survey



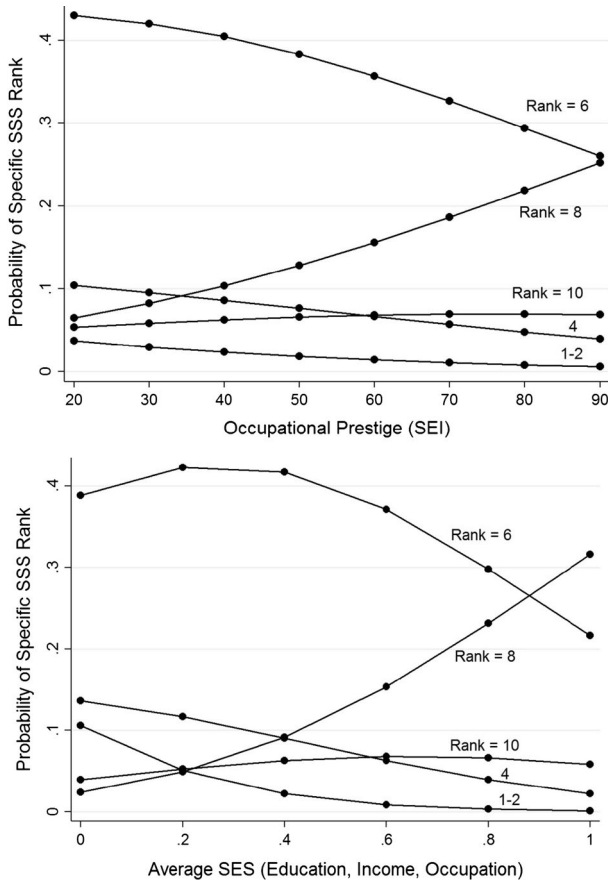


Fig. 6 Predicted probabilities of specific SSS ranks across levels of occupational prestige and average SES: 2010–2014 General Social Survey

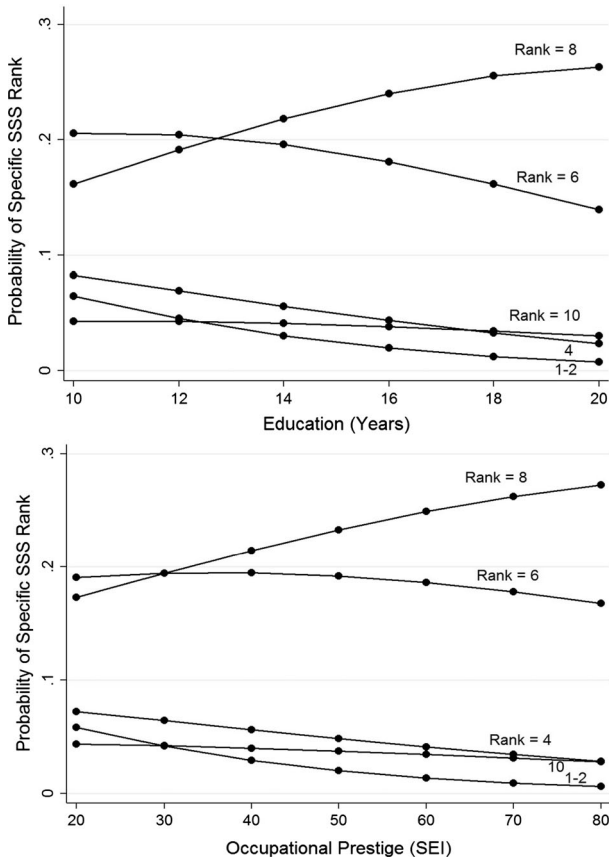
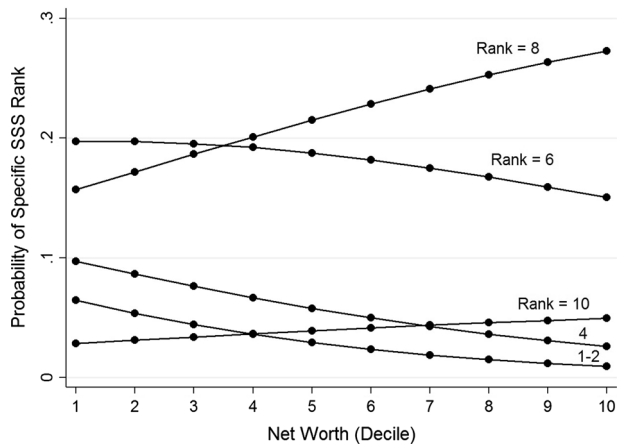


Fig. 7 Predicted probabilities of specific SSS ranks across levels of education and occupational prestige: 2005 MIDUS

Fig. 8 Predicted probabilities of specific SSS ranks across deciles of net worth: 2005 MIDUS



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