Relative Social Status in Context:
Is Perceived or Actual Status More Important for Young Adult Health?

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Background:

It is well established that disparities exist for many health outcomes and along a variety of socioeconomic gradients, but the fundamental question of *why* this health gradient exists is still debated. Two different strands of thought have emerged to explain how socioeconomic disadvantage strains health. The first posits that material deprivation is connected to worse health outcomes through a number of mechanisms, most related to access to resources (Link and Phelan 1996, Braveman et al 2005, Adler et al 1994). The second argues that at every level of socioeconomic status, inequality and relative status are the driving factors behind health disparities, as low status "gets under the skin" both directly through physiological stress and indirectly through health behaviors utilized to relive such stress (Wilkinson 1999, Marmot 2004). After decades of support for the first hypothesis, there is emerging evidence that suggests subjective social status, or perceived relative SES, which reflects a person's perceptions of their relative social standing, is more strongly related to morbidity and mortality than objective measures of SES like education, income and occupation (Adler et al 2000; Singh-Manoux et al 2003; Singh-Manoux et al 2005; Ostrove et al 2000; Demakakos et al 2008).

To what extent perceived status reflects actual relative rankings and actual absolute socioeconomic status is still being explored in the literature. However, to my knowledge no one has examined differences in perceived and actual SES and how under- or over-estimating one's status is important for health. This paper will explore the interplay between absolute and relative socioeconomic status and how they relate to health in young adulthood using the National Longitudinal Study of Adolescent Health (Add Health). This paper will contribute not only to the debate regarding how low SES "gets under the skin" to affect health, but will do so with a nationally representative sample of young adults, a population for whom traditional markers of SES may not be the best way of capturing status, as this period of transitioning to adulthood is marked by fluidity and uncertainty.

Research Questions:

1. What are the associations between the various conceptualizations of SES, including:
    a. actual absolute SES (AAS),
    b. perceived relative SES (PRS), and
    c. actual relative SES (ARS)?
2. How does each of the above means of conceptualizing SES predict differences in objective biomarkers, independently and when mutually adjusted?
3. Who experiences disjuncture between the various ways of conceptualizing SES?
4. Do those who perceive their status to be over/underestimates of their actual absolute and relative status have worse or better health than those who accurately assess their SES?

Data, Methods, and Measures:

This paper uses the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative data set that originally sampled 20,754 students ages 12 - 18 from 132 middle- and high-schools across the country during the 1994-1995. The first wave of data collection includes an in-school survey, a more detailed in-home interview, a parent questionnaire and Census

data based on the respondent's home address. Three additional waves of data were collected in in-home interviews to follow the original cohort as they aged: Wave II (1995 – 1996), Wave III (2001 – 2002), and Wave IV (2008 – 2009). Biomarker collection was part of Wave IV, and nearly every respondent has these objective measures of physical health available to analyze.

Add Health is an ideal data set for this paper for a number of reasons. First, in addition to rich demographic, social, behavioral and economic data on all the respondents, Add Health also includes information about the contexts in which respondents resided at the time of each wave of data collection. Thus, I can assess not only how current relative standing matters for current health, but also how experiences with relative standing in adolescence and during the transition to adulthood relate to health later in the life course. Finally, examining a young adult cohort will reveal more about the process through which socioeconomic status gets under the skin to affect health. Most studies examining perceived relative SES have focused on later adulthood, once disease has manifested. By utilizing biomarker data from a nationally representative sample of young adults, I plan to demonstrate that these disparities in health begin early in the life course, even before typical diseases emerge.

I will first explore the three operationalizations of SES by testing their associations with each other and their independent associations with various covariates like age, sex, race/ethnicity and immigrant status. Then I will use OLS and logistic regression to assess the relationship between the three types of variables and my dependent measures of health. Finally, I will explore disjuncture in conceptualizing SES by studying those whose perceptions of their status are dissimilar from their actual absolute and relative standings. I will explore predictors and health consequences of disjuncture with correlation analysis and multivariate regressions.

Dependent Variables:

C-reactive protein: CRP measures the amount of inflammation in the body, a reflection of physiological dysregulation that often occurs in response to chronic stress. To adjust for skewing, I create a linear variable of the logged value of the original CRP measure (logCRP). In addition, I utilize a clinically relevant categorical measure of inflammation: Low (CRP < 1), Average (CRP between 1- 3), High (CRP between 3- 10) and Very High (CRP >10)

Blood pressure: Add Health reported both systolic and diastolic linear blood pressure, which can also be considered measures of cardiovascular dysregulation. For this paper, I use a linear measure of systolic blood pressure (SBP) and a clinically relevant binary indicator of hypertension to capture both diagnosed and undiagnosed hypertension, including those who had high measured blood pressure (SBP>=130 and/or DBP>=90), self-reported a hypertension diagnosis or were taking hypertension medication at the time of the Wave IV survey.

Independent Variables:

Actual Absolute SES (AAS):

Respondent Income: Respondent's reported their household (HH) income by choosing the appropriate range in which their income in the past year fell. I use the midpoint from the income ranges to estimate the respondents' HH income

Perceived Relative SES (PRS):

Subjective social status: I use the variable at Wave IV that asked respondents to place themselves on a ladder compared to the rest of the US population, with the lowest run (1) being those least well-off and the top rung (10) being those the most well-off.

Actual Relative SES (ARS):

Status compared to neighbors: I divide the respondents' household income by the median income of their current census tract to create the HH to Tract Income Ratio. Higher values indicate higher relative status, while values less than zero represent lower relative status.

Control Variables:

Socio-demographic: I control for other variables that are also related to the biomarkers, including age, sex, race/ethnicity (White, Black, Asian, Native American/Other and Hispanic), family structure (living with both biological parents; two-parents, step; single mother; single father; or other), and immigrant status (native born, second- or first- generation), all at baseline.

Preliminary Findings:

Table 1 presents the correlations between own HH income (AAS), the ladder variable (PRS), and the ratio between HH income and the median income of the respondents census tract (ARS). Perceived relative standing was more correlated with household income than the ratio of household income to tract income. Table 2 shows the independent and mutually adjusted correlations between the three SES variables and hypertension. HH to Tract Income Ratio was not significantly related to either biomarker outcome in either model. In both Models 1 and 2, both the ladder and HH income variables were independently associated with reduced risk of hypertension and elevated inflammation.

Further research/conclusion:

Preliminary evidence suggests that while somewhat correlated, each operationalization of SES is related differently to health outcomes in young adulthood. These initial results suggest that each operationalization is capturing a unique dimension of socioeconomic status. While the ratio of household income to the median census tract income here was not significantly related to hypertension or inflammation, I will continue to explore other measures of actual relative SES. I plan on examining not only respondent's relative status compared to their neighbors, but also how their status attainment compares to that of their schools peers from Wave I. Due to the original school-based sampling approach, I can compare respondents' actual absolute SES at Wave IV to the concurrent absolute SES of their peers from adolescence. I will also compare respondents' income and education to the median income of their racial/ethnic group in the US and in their more proximate geographic areas.

In addition to exploring the first two questions with additional operationalizations of SES, I will also address research questions 3 and 4: who over/under estimates their relative status, and what does this mean for their health? As the preliminary results shows, both perceived status and absolute material resources operate independently of each other to relate to health. Addressing over and underestimation will help to continue to unravel the relative importance of each operationalization of SES.

Table 1: Correlations between SES Variables (N=11,070)

	HH to Tract Income Ratio	Ladder	Wave IV Household Income
HH to Tract Income Ratio	1		
Ladder	0.2159	1	
Wave IV Household Income	0.7136	0.3321	1

Table 2: Odds Ratios of the Associations between SES Variables and Hypertension and Inflammation (N=11,070)[+]

	Hypertension		Inflammation	
	(1)^	(2)^^	(1)^	(2)^^
HH to Tract Income Ratio	1.000	1.103	0.957	1.049
	(0.935 - 1.069)	(0.992 - 1.226)	(0.908 - 1.008)	(0.962 - 1.144)
Ladder	0.930***	0.923***	0.914***	0.917***
	(0.900 - 0.961)	(0.888 - 0.959)	(0.889 - 0.939)	(0.891 - 0.944)
Wave IV Household Income	0.998*	0.998*	0.998***	0.998*
	(0.997 - 1.000)	(0.995 - 1.000)	(0.997 - 0.999)	(0.996 - 1.000)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

+ The hypertension models use logistic regression, while the inflammation models use ordered logistic regression.

^Model 1 shows the separate associations between the independent and dependent variables, adjusted for age, sex, race/ethnicity and immigrant status.

^^Model 2 shows the mutually adjusted associations between the independent and dependent variables, adjusted for age, sex, race/ethnicity and immigrant status.