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Relations Between Socioeconomic Status, Subjective Social Status, and Health in Shanghai, China*

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Objectives. Although research has established a strong link between socioeconomic status (SES) and health in Western settings, comparable work in China lags behind. Similarly, studies showing a unique relationship for subjective social status (SSS) and health above and beyond SES have yet to be tested in China. The present study addresses these gaps. *Methods.* Regression analyses investigated the relationship between SES, SSS, and mental and physical health net of several covariates for 2,282 caregivers in Shanghai, China. Indirect relationships for SES through SSS were also tested. *Results.* Results indicate that SES is linked to mental and physical health outcomes, but in complicated ways. SSS, on the other hand, is consistently and robustly linked to health outcomes above and beyond income, education, occupational prestige, and *Hukou* status. Further significant indirect effects were found through SSS for income, education, and *Hukou* status. *Conclusion.* In China's context of rapid economic growth, relationships to SES and health appear complicated. However, subjective perceptions of status are consistently linked to health outcomes.

The People's Republic of China (henceforth called China) has undergone dramatic social and economic changes since shifting in 1978 from a centrally planned economy to a market-based economy. These changes are characterized by rapid development, national prosperity, and, on average, greatly increased socioeconomic status (SES) for many people (Naughton, 2007). Yet these improvements have also been accompanied by drastic rises in social inequality, rapid urbanization, and demographic shifts. Emergent research in the context of China has shown that lower SES is associated with lower mental and physical well-being (Zhao, 2012), yet the underlying mechanisms linking SES and health remain largely unexamined. This warrants further research given that: (1) it has been well documented that differences in mental, physical, and educational outcomes are not fully accounted for by SES (Adler et al., 2000; Wilkinson and Picket, 2009); and (2) as such, it is difficult to know how best to target programs and policies to address rapid growth without a clear understanding of the underlying processes by which SES impacts mental and physical health.

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To address this gap, a promising line of research explores individuals' subjective perceptions of their socioeconomic position: subjective social status (SSS), defined as the subjective assessments a person makes about his or her place in society relative to a particular group (e.g., nation or community), has been shown to predict mental and physical health outcomes above and beyond the contributions of objective measures of SES (e.g., income, material resources) (Adler et al., 2000; see Nobles, Weintraub, and Adler, 2013 for a review). To date, very little work has been done to investigate such associations in the context of China. This article aims to address these gaps in the literature by addressing the following specific aims: (1) examine the associations between objective SES, SSS, and key mental and physical health outcomes in China; and (2) investigate whether SSS indirectly links SES and mental and physical health outcomes. We do so using data from caregivers of primary-school-aged children in Shanghai, China. Given that nearly 40 percent of Shanghai's population are low-SES migrants from rural areas (Eades, 2014) and unregistered migrants in urban areas make up nearly one-sixth—and growing—of China's population, our research in Shanghai provides an illuminating case for understanding how SES and SSS may shape individual well-being in the context of rapid urbanization, social inequality, and migration.

Rapid Development of Growth and Inequality in China

Over the past three decades, China has transitioned from a primarily agrarian society with a planned economy to one that is increasingly urban and market driven (Naughton, 2007). Since the adoption of this "Open Door" policy China has experienced radical social and economic changes, with GDP growth averaging 10 percent a year (World Bank, 2014). While China was not immune to the global downturn during the Great Recession, it boasted an increase in GDP of 7.7 percent in 2013. In the past 35 years, state and private business have flourished and more than 500 million people have been lifted out of poverty. However, despite these gains, China is a vastly unequal middle-income country with nearly 100 million still below the national poverty line of RMB 2,300 per year as of the end of 2012 (World Bank, 2014). Indeed, recent estimates of international Gini coefficients, a popular index of country-level income inequality, showed China's Gini ranging from 0.53 to 0.55, a much higher estimate than, for example, the United States' 0.45 (Xie and Zhou, 2014).

These trends grow more complicated when considering the consequences they have had on the two-tiered social hierarchical system known as *Hukou*. Established in 1955, the *Hukou* system assigns all citizens into either an agricultural (noncity) or nonagricultural (city) status at birth on the basis of the mother's registration status (Chan and Zhang, 1999; Naughton, 2007). Given that migration between rural and urban areas was originally prohibited under this system, agricultural households were traditionally confined to the rural countryside and were entitled to far fewer social benefits (including medical insurance, housing subsidies, pensions, and educational opportunities for children) than those born in urban areas. In 1984, attempts to adapt to the market economy led to policy changes allowing rural peasants to move into the city, though access to government services did not change. From this emerged a new distinction of workers known as migrant peasant workers, who are still registered as rural farmers but are working in nonagricultural labor. While the Chinese government has recently considered household registration system reform, *Hukou* status still serves as a primary mechanism for determining life chances and resource allocation in China. Indeed, research shows that despite peasants' access to urban contexts, they continue to face social exclusion, discrimination, and diminished opportunity (Han, Huang, and Han, 2011).

SES and Health in China

The unprecedented growth China has experienced since the adoption of the Open Door Policy has ushered in both tremendous prosperity and high levels of social inequality. Research from Western countries on SES (conventionally defined as a composite of income, occupational prestige, and education) suggests these changes may have important implications for the well-being of Chinese. *Hukou* status should also be considered a marker of SES in China because it dictates the social benefits a person receives, with noncity status garnering a lower social position in society (Han, Huang, and Han, 2011). In Western settings, the positive relationship between SES and mental and physical health has been well documented across several contexts and among several samples (e.g., Adler et al., 1994; Hackman, Farah, and Meaney, 2010; Marmot et al., 1991). Studies have shown that low-SES individuals tend to be exposed to multiple individual, family, and school risk factors (Evans and Kim, 2010), live in lower resourced neighborhood contexts (Santiago, Wadsworth, and Stump, 2011; Seidman et al., 1998), and have higher exposure to stress (Blair et al., 2011; McEwen, 1998; Sapolsky, 2004), all of which in turn contribute to worse health outcomes. Further, growing evidence shows that the degree of inequality due to differences in SES is additionally negative for health outcomes regardless of how much overall wealth is present (Adler and Conner Snibbe, 2003; Marmot and Brunner, 2005; Wilkinson and Pickett, 2009).

Far less attention has been given to understanding the SES-health relationship in China. What studies do exist suggest it may operate differently than what is established in Western research. For example, a study with elderly people in rural and urban China found bank savings and household amenities to significantly predict self-reported physical health; yet income, education, and a proxy for occupational prestige were all unrelated to health (Zimmer and Kwong, 2004). Contrasting literature from Western countries, this study found that individuals with *higher* income reported more chronic health conditions such as cardiovascular disease. A different study, however, found that the association between SES and metabolic syndrome for cardiovascular disease was significant only for women in a cross-sectional sample of over 10,000 participants (Zhan et al., 2012). Similar mixed findings have been recorded for hypertension as well (Lei, Yin, and Zhou, 2012). In a nationally representative data set, low household income and low levels of schooling linked to higher risk of chronic obstructive pulmonary disease for urban Chinese, but only education was significant for rural populations (Yin et al., 2011). Conversely, Hu and Huang (2016) found that medical utilization among the elderly, especially the rural poor, was strongly influenced by income such that expenditures on medical treatment hindered low-income elderly from receiving necessary levels of treatment.

Evidence for the association between SES and mental health in China reflects a similar pattern. For instance, a longitudinal study found SES, as measured by education and income, to be associated with cognitive function among an elderly population; however, the advantage provided by higher SES weakened significantly as respondents aged (Yang et al., 2016). A recent study linked such somatic symptoms with depression in a hospital-based cross-sectional design, but this study did not include SES factors (Zhu et al., 2012). Scholarship addressing the role of *Hukou* status has provided additional insight into SES dynamics in China's health. For instance, noncity *Hukou* status was associated with higher reports of depressive symptoms for elderly Chinese relative to their city-*Hukou* counterparts, a finding the authors linked to familial supports suffering from increased rural-to-city migration (Zurlo, Hu, and Huang, 2014). A study investigating the social correlates of mental health in China found a higher prevalence of depressive symptoms for internal migrant workers, but neglected to include SES variables in the model (Yen and Syme,

1999). A recent study did include SES in its investigation of major depressive disorder for migrant factory workers in Shenzen, but only found an association with lower education and found no association for levels of income (Zhong et al., 2015). Taken together, there exists relatively little work examining the specific role of socioeconomic factors on health in China; what does exist has provided mixed results that merit further investigation.

Subjective Social Status

Subjective assessments of status have also been shown to be important for health outcomes. Defined as the subjective assessments individuals make about their SES relative to others, SSS has been shown to independently capture the influence of social status beyond issues of available material resources, or *objective* SES. Specifically, Adler and her colleagues (2000) found positive relations between SSS and many physical health outcomes in the United States, including self-rated health, optimal heart rate, and fat distribution among participants considered to be in good health, even after including education, income, and job status in the model. In a nationally representative U.S. sample of adolescents, reports of SSS were positively related to self-reports of health, adjusting for objective SES in both cross-sectional and longitudinal designs (Goodman et al., 2007). Research also suggests that SSS may serve as a proxy for the effects of status-related physiological stress. For example, SSS has been found to be associated with metabolic stress reactivity (Manuck et al., 2010), hyperactivity of the hypothalamic-pituitary-adrenal axis gland, and higher levels of cortisol reactivity (Goodman et al., 2005; Pham-Kanter, 2009). SSS was even associated with susceptibility to the common cold in a randomized control trial (Cohen et al., 2008).

In terms of mental health, SSS was found to be a significant predictor of depression in the United States, net of objective measures of income, education, and employment (Singh-Manoux, Adler, and Marmot, 2003). In addition, McLaughlin et al. (2012) conducted a study relating SES and SSS to mood, anxiety, and behavioral and substance abuse disorders in adolescent youth and found SSS to be the strongest, most reliable predictor of the presence of these disorders. Finally, the presence of both affective mood disorder and anxiety was predicted by SSS in a large sample of Asian immigrants in the United States. This association was moderated by time of immigration such that immigrants who arrived after the age of 25 exhibited stronger associations between SSS and mood dysfunction (Leu et al., 2008).

To our knowledge, only a few studies have directly investigated SSS in the context of China or Chinese society. In one study, researchers found SSS to be significantly and positively associated with physical activity difficulties and ease of daily living using a sample of Taiwanese elderly (Hu et al., 2005). The second, more recent study had a representative sample of the population in China, but it primarily emphasized perceptions of inequality more broadly (Han, 2014). Further, the author trichotomized SSS, which is methodologically inconsistent with previous literature. Recently, two studies have looked directly at the trends and factors related to SSS as the outcome of interest. The first of these studies found that, relative to the nation's average, rural Chinese's SSS reflects an overestimation of their objective SES while urban Chinese's reflect the opposite (Chen and Fan, 2015). The second study leveraged longitudinal data to show that, while rising, Chinese tend to place themselves lower on a subjective ladder than do their Western counterparts (Chen and Williams, 2016).

The Current Study

The current article builds upon the emerging research described above to investigate the complex role of SES, *Hukou* status, and SSS in predicting health outcomes in a

large sample of caregivers in Shanghai, China. To do so, we ask two interrelated research questions. First, do SES (education, income, occupational prestige, and *Hukou* status) and SSS uniquely predict physical and mental health, while adjusting for each other? While it is well known that higher levels of SES are associated with better health outcomes in Western settings, how this relationship looks in the context of China's market economy is less clear. Further, the rise in social inequality is likely to make subjective social comparisons more salient—and subjective assessments of social status increasingly relevant—above and beyond indicators of material resources captured by objective SES. Second, is SSS a potential mechanism linking SES to mental and physical health outcomes? Research supports this pathway, as negatively comparing oneself to those better off is known to increase levels of stress known to be deleterious for health outcomes (McEwen, 1998; Sapolsky, 2004). It is plausible, then, that the associations between SES/*Hukou* status and health may in part travel through SSS. To our knowledge, no study has specifically tested this model.

Method

Participants and Procedure

Data come from the 2014 Child Well-Being Survey collected by the New York University-Eastern China Normal University (NYU-ECNU) Institute for Social Development at NYU Shanghai. Participants were caregivers of first-grade children in public schools in Shanghai, China. Descriptive information is presented in Table 1. NYU IRB approved all sampling and data collection procedures before the start of the study. In spring 2014, from March 1 to May 1, we sampled seven out of a total of 17 districts in Shanghai, China. The principal motivation for selecting the chosen seven districts was to ensure equal representation from diverse family socioeconomic backgrounds as well as from migrant families (i.e., *Hukou* registration is rural vs. urban). We then sampled one to five schools from each of the seven districts with a total of 17 schools and 73 classrooms. Questionnaires were disseminated to school administrators, first-grade classroom teachers, and parents of children in the selected first-grade classrooms, resulting in a convenience sample of 2,282 adults with an average age of 35.47 (SD = 5.25).

Measures

Objective SES. Objective SES is typically conceptualized as consisting of income, education, and occupational prestige. For income, we used self-reported total annual personal earnings and then followed up with category options if the respondent did not give specific amounts. For education, we asked the respondents to report the highest educational level they achieved, ranging from "no formal education" (1), to "graduate degree" (8). For occupational prestige, we included a dichotomous variable that represented jobs considered to be relatively prestigious, such as professionals and managers. We used a dichotomous variable for *Hukou* registration (noncity = 1, city = 0).

Subjective Social Status. Caregivers' SSS was assessed using a regionally modified version of the nationally referenced MacArthur Scale of SSS (Adler et al., 2000). Respondents were first shown a picture of a 10-step ladder and asked to think of it as representing where

TABLE 1

Sample Characteristics Before and After Imputation

	Variable	Before Imputation			Number Missing	After Imputation
		Mean (*SD*) or %	Minimum	Maximum		Mean (*SD*) or %
Main Variables						
	Depression	9.50 (7.22)	0	44	0	9.50 (7.22)
	General health	3.06 (0.92)	1	5	121	3.05 (0.91)
	Physical symptoms	6.23 (4.28)	0	13	0	6.23 (4.28)
	Education	5.41 (1.66)	1	8	54	5.41 (1.66)
	Personal income	6.78 (2.91)	1	12	539	6.73 (2.91)
	Hukou status	34.04%	0	1	73	34.02%
	High-status job	43.16%	0	1	461	42.52%
	Subjective social status	5.29 (1.66)	1	10	277	5.29 (1.66)
Covariates						
	Caregiver age	35.47 (5.25)	20	72	351	35.73 (5.67)
	Non-Han ethnicity	2.29%	0	1	52	2.29%
	Type of caregiver					
	Mother	64.72%	0	1	68	64.27%
	Father	32.84%	0	1	68	32.98%
	Other	2.44%	0	1	68	
	Unmarried	10.39%	0	1	0	10.39%
	Spouse's education	5.31 (1.74)	1	8	72	5.30 (1.74)
	Spouse high-status job	47.43%	0	1	511	44.45%
	Receives welfare	47.06%	0	1	0	0.47%
	Neighborhood safety	1.85 (0.49)	1	3	450	1.85 (0.54)

NOTE: Total sample size after imputation = 2,282. Postestimate sample characteristics computed from 50 imputed data sets, using Rubin's rules to adjust for uncertainty from imputed values (Royston, 2005; Rubin, 2004).

people stand in China and were told: "the top of the ladder (10th rung) are the people who are the best off: those who have the most money, the most education, and the most respected jobs. At the bottom (1st rung) are the people who are the worst off: who have the least money, least education, and least respected job or no job." Respondents were instructed to place themselves on the rung that they felt most represented their relative standing.

Mental Health. We indexed caregivers' mental health using a 20-item measure of depression, the Center for Epidemiological Studies-Depression (CESD) scale (Radloff, 1977), that has been previously translated and validated for use in the Chinese context (e.g., Cheung and Bagley, 1998). Respondents were asked how often they felt or behaved a certain way within the past week (0 = never, 1 = one to two days, 3 = three to four days, 4 = five to seven days). Sample items include: "I felt depressed," "I felt hopeful about the future" (reverse coded), and "I had crying spells." Responses were summed; the average sum of the score was 9.50 ($SD = 7.22$; $\alpha = 0.86$) ranging from 0 to 44. Approximately 18 percent of the respondents had a score equal to or larger than 16, a cut-off point considered to be at risk for clinical depression (Radloff, 1977).

Physical Health. Caregivers' physical health was assessed in two ways. First, we used the single-item general self-rated health (GSRH) question to assess the respondent's general health, ranging from (1) poor to (5) excellent. This measure has been robustly shown to be a strong indicator of physical well-being (Desalvo et al., 2006). Next, 13 items asked if the respondent experienced any of a series of physical symptoms, such as headaches, faintness, or dizziness, during the past three months. The average number of physical symptoms that a caregiver experienced during the past three months was about 3. Responses were dichotomized and summed into a count score to proxy for the overall physical health of the respondent. The higher the score, the more negative physical symptoms were experienced by the respondent. Respondents who indicated on the GSRH that they had either fair or poor health had significantly more physical symptoms than those who indicated their health was good or better (3.8 vs. 2.4, $p < 0.001$).

Covariates. Several covariates were included in the model to better address selection bias and improve the precision of our model. Demographic covariates were age, ethnicity (non-Han = 1 vs. Han = 0), marital status (unmarried = 1, married = 0), and type of caregiver (mother = 64.8 percent, father = 32.8 percent, and other = 2.4 percent). Spouse's highest level of education and job status were also included, as was neighborhood safety, and a dichotomized variable for receipt of government welfare, including receiving health insurance and low-income cash assistance (receive welfare = 1 vs. not receiving = 0). For neighborhood safety, we asked the respondent if he or she felt safe to let his or her children play outside of the home, with responses ranging from (1) very safe to (3) not at all safe.

Analytic Strategy

Missing Data. Several variables of interest had at least some missingness in our data, ranging from 3.2 percent (e.g., *Hukou* status) to 23.6 percent (e.g., personal income), though descriptive analyses revealed no clear systematic patterns. As such, multiple imputation by chained equations (MICE) was employed to ensure the maximum information

possible could be utilized for our analyses while accounting for possible nonrandomness in missing. MICE, also known as sequential regression multiple imputation or fully conditional specification, is most appropriate for data such as ours where many variables have missing data but the reason for missingness does not depend on unobserved variables (Azur et al., 2011; Lee and Carlin, 2010). A total of 50 data sets were generated from all of the variables in the model. Aggregated descriptive information is found in last column of Table 1.

Statistical Analyses. Given the nature of our sampling procedure, intraclass correlations for the dependent variables were calculated (all under 0.01), demonstrating that there was no school- or district-level variance to merit multilevel modeling. However, in order to correct for the fact that observations were not independent given the clustering in the design, all regressions were performed with robust standard errors using Huber-White sandwich estimators (Szpiro, Rice, and Lumley, 2010). For depression, the variable was very positively skewed given that a large number of respondents reported no depressive symptoms. To retain variation for those who did report multiple symptoms, we used a Poisson regression. This allows for the use incident rate ratios (IRRs) to interpret the probability of increasing the number of symptoms a person reports for only those who do report any depression. IRRs are created by exponentiating the regression coefficients, allowing interpretation similar to odds ratios (Hoffmann et al., 2008). For general health, which was normally distributed (within the range of 1 = poor to 5 = excellent), generalized least square (GLS) regression was used and interpreted by standardized coefficients. Our final dependent variable, reports of physical symptoms in the past week, was also a Poisson regression owing to a positively skewed distribution of respondents reporting no symptoms at all.

To test our first research question, each model regressed SSS, measures of SES (reported income, level of education, having a prestigious occupation), and *Hukou* registration status on each of our three dependent variables (depression, general health, and physical symptoms reported within the past week) net of all covariates. To address our second research question, we conducted Sobel-Goodman tests for indirect effects. Specifically, we first used seemingly unrelated regressions (SURs) to calculate each direct path between our SES and health variables as well as each direct path between SES and the mediator of SSS, all with the full array of covariates in the model. Given the correlational nature of the data, SUR was appropriate for simultaneously taking into account the error correlations across all equations in all of our imputed data sets to ensure the full variance is used for creating each direct path needed to calculate indirect paths (Binkley and Nelson, 1988; Zellner, 1962). We then calculated the standardized indirect regression coefficients by multiplying the standardized coefficient of SES to health with the standardized coefficient for the direct path between SES and SSS. We did this procedure for each of our SES to health relationships within each of our 50 imputed data sets and then combined them using Rubin's rules, thus bootstrapping the results (Royston, 2005; Rubin, 2004).

Results

Research Question 1: SES and SSS on Health

Poisson regressions detected that two of our SES indicators (income and *Hukou* status) were significantly and positively associated with depression as expected, with the other two indicators (caregiver's education and occupational prestige) not being significant (see Table 2, Column 1). Specifically, our results showed that higher reports of income were

TABLE 2

Regression Estimates of SES and SSS on Health Outcomes

			General Health		Physical Symptoms	
	Depression IRR	(Standard Error)	β	(Standard Error)	IRR	(Standard Error)
Covariates						
Caregiver age	0.99	(0.002)**	−0.12	(0.005)**	1.00	(0.003)
Non-Han ethnicity	0.97	(0.048)	−0.05	(0.128)*	1.02	(0.060)
Type of caregiver						
Father	1.07	(0.019)**	0.07	(0.045)**	0.89	(0.020)**
Other	1.03	(0.081)	0.02	(0.168)	1.22	(0.092)**
Unmarried	0.96	(0.024)+	−0.05	(0.068)*	1.18	(0.034)
Spouse's education	1.00	(0.008)	0.01	(0.021)	0.98	(0.009)**
Spouse high-status job	0.99	(0.024)	0.01	(0.048)	1.04	(0.026)*
Refused to report income	1.02	(0.021)	0.05	(0.055)*	0.98	(0.025)+
Receives welfare	1.09	(0.016)**	0.00	(0.039)	0.98	(0.017)
Neighborhood safety	0.90	(0.020)**	0.07	(0.044)**	0.92	(0.021)**
Socioeconomic Status						
Education	0.99	(0.009)	−0.07	(0.022)+	1.00	(0.010)
Income	0.97	(0.004)**	−0.01	(0.009)	1.03	(0.005)**
High-status job	0.99	(0.023)	0.02	(0.049)	0.92	(0.026)**
Noncity *Hukou* status	1.07	(0.023)**	0.10	(0.055)**	0.97	(0.025)
Subjective Social Status	0.95	(0.006)**	0.15	(0.013)**	0.96	(0.007)**

+ < 0.10; *p < 0.05; **p < 0.001.

TABLE 3

Standardized Indirect Effects of SES Through SSS on Health

	Depression β (Standard Error)	General Health β (Standard Error)	Physical Symptoms β (Standard Error)
Income	−0.034 (0.008)	0.040 (0.008)	−0.022 (0.007)
Education	−0.036 (0.008)	0.042 (0.008)	−0.023 (0.008)
Hukou status	0.026 (0.006)	−0.031 (0.006)	0.017 (0.008)

NOTE: All relationships significant at the $p < 0.01$ level.

significantly associated with lower reports of depression (*Exp(B)* = 0.970, $p < 0.001$). Looking at the IRRs, our data show that for every unit increase into a higher income bracket, the percent change in incident rate for depression reduced by 3 percent, net of all covariates. Similarly, *Hukou* status was significantly associated with depression (*Exp(B)* = 1.07, $p < 0.001$) such that migrant workers in the city were approximately 7 percent more likely to report more depression symptoms than their urban counterparts.

GLS regressions found significant associations between SES and physical health, but the patterns were mixed (see Table 2, Column 2). *Hukou* status was the only indicator of SES that was significantly related to self-reported general health, but the relationship was positive ($\beta = 0.10$, $p < 0.001$). Migrant workers, on average, reported approximately 1/10th of a standard deviation better overall health than their urban counterparts. In terms of reports of experiencing physical symptoms in the past three months, Poisson regressions for reports of physical symptoms showed similarly complex patterns (see Table 2, Column 3). Consistent with expectations, caregivers with a high-status job were approximately 8 percent less likely to report an additional physical symptom (*Exp(B)* = 0.92, $p < 0.001$). In contrast, personal income was positively related to reports of physical symptoms such that for every unit increase into a higher income bracket, the likelihood of reporting another symptom increased by 3 percent (*Exp(B)* = 1.03, $p < 0.001$). Level of education was not significantly associated with either physical health outcome.

As shown in Table 2, SSS was significantly associated with all three outcomes in the expected direction, net of SES, *Hukou* status, and covariates. For depression, Poisson regression results indicated that, on average, for every additional rung on the SSS ladder, the percent change in the incident rate for depression reduced by 5 percent (*Exp(B)* = 0.950, $p < 0.001$). SSS was significantly and positively associated with better reports of general health ($\beta = 0.15$, $p < 0.001$) and fewer experiences of physical symptoms in the past week (*Exp(B)* = 0.96, $p < 0.001$). Specifically, for every rung increase in SSS, reports of general health improve by approximately 0.15 standard deviations. Similarly, interpreting the IRRs produced by the Poisson regression for reported physical symptoms, every additional rung on the SSS ladder is associated with a 4 percent reduction in the incidence rate of reporting an additional symptom.

Research Question 2: Indirect Effects of SES Through SSS on Health

The complexity of the results motivated us to investigate possible indirect paths for SES. As shown in Table 3, significant indirect effects for SES were detected through SSS to depression in the anticipated direction for each objective SES variable. Specifically, higher reports of income and education were significantly associated with perceptions of higher

SSS, which in turn were associated with significantly lower reports of depression, yielding significant indirect effects of ($\beta = -0.034$, $p < 0.01$) for income and ($\beta = -0.036$, $p < 0.01$) for education. Nonurban *Hukou* status was associated with significantly lower perceptions of SSS, which in turn predicted higher levels of depression ($\beta = 0.026$, $p < 0.01$). The absence of a direct effect for education suggests that its relationship with depression is fully mediated by SSS. That is, since education was not directly associated with depression in our sample on average, this indirect finding suggests that higher levels of education are only associated with lower levels of depression via its relationship of SSS.

For physical health, the same pattern was detected. Significant indirect effects through SSS were present on general health for personal annual income ($\beta = 0.040$, $p < 0.01$), level of education ($\beta = 0.042$, $p < 0.01$), and *Hukou* status ($\beta = -0.031$, $p < 0.01$), suggesting that higher SES is associated with higher general health in part through SSS. Similarly, higher reports of personal income ($\beta = -0.022$, $p < 0.01$), level of education ($\beta = -0.023$, $p < 0.01$), and *Hukou* status ($\beta = 0.017$, $p < 0.01$) were significantly associated with lower reports of recently having physical symptoms through SSS. The absence of a direct effect for income and education for reports of general health, and education or *Hukou* status for reports of physical symptoms, provide evidence that the role of objective measures of status may be fully mediated by SSS.

Discussion

The current study investigates how social status links to health in the rapidly changing economic landscape of China. We tested two primary research questions: (1) How do SSS and SES (income, education, occupational prestige, and *Hukou* status) relate to mental and physical health, net of each other and several covariates? and (2) Is there evidence that the association between SES and health can be at least in part explained via their relationship with SSS? For SES, we found that each measure (caregiver education, job status, personal income, and *Hukou* status) was associated with health outcomes (depression, general health, and reports of physical symptoms), albeit in complex ways that were occasionally in contrast with previous research conducted in Western contexts. Specifically, on average, higher income was associated with lower depression and better self-rated health, but also more reports of physical health symptoms. Having a high-status job was only associated with lower reports of physical symptoms. *Hukou* registration was associated with higher depression, but also higher self-reported health. Education was not predictive in our model.

While our results are not in line with the dominant Western literature on SES and health, they are not entirely inconsistent with previous findings in China. For example, higher income in particular has been shown to associate with worse health outcomes for chronic diseases such as cardiovascular disease (Zimmer and Kwong, 2004) and hypertension (Lei, Yin, and Zhao, 2012). However, interpretations of such seemingly anomalous findings have varied. On one hand, researchers have called for more sensitive measures of SES for the context of China, reasoning that the conventional indices of income, education, and occupational prestige are only accurate for Western contexts (Oakes and Rossi, 2003). On the other hand, it is also possible that these different patterns of findings for these measures capture the unique features of SES experienced in contemporary China. While beyond the scope of the current study, it is possible that the rapid economic growth and urbanization over the past 30 years in China may reshape how income, education, and other such social rankings influence health. As one example, studies have shown that around the world,

increases in household income are associated with a change in diet: from cereals and tubers to meats, fats, and sugars. These dietary changes have in turn been linked to the rising global incidence of obesity, heart disease, and diabetes, to name only a few (Keats and Wiggns, 2014; Monteiro et al., 2004).

Contrasting with the above, we found that SSS had a positive and robust relationship with all health outcomes, each in the anticipated direction. It is possible that subjectively feeling relatively better or worse than one's comparable peers can exert particular influence on health outcomes that may layer on top of the consequences of resource and material deprivation. It is further meaningful that SSS demonstrated this clear and consistent positive relationship with better health outcomes despite SES showing mixed results. Not only does this finding support that subjective perceptions of social comparisons uniquely contribute to health outcomes, it suggests that SSS may provide a clearer link to health in the context of China than do conventional indices of objective status. Further, we found a significant indirect effect for all of the tested measures of SES (income, education, and *Hukou* status) through SSS on each of our health outcomes (depression, general health, and reports of physical symptoms). For all measures of SES, higher status related to better health outcomes via how those experiences of status were subjectively perceived; that is, all measures of SES were positively associated with SSS, which in turn were positively associated with better health. This held true even for the measures of SES that showed negative or insignificant direct associations. This provides evidence that, regardless of the direct relationship of SES, if individuals' subjective assessment of their relative socioeconomic position is positive, they are more likely to have better ratings of health.

This is not to say that SSS is more important than SES. Instead, we argue that one of the ways SES matters for health is via the subjective feelings an individual has about his or her respective standing. Such differences in how individuals feel about their relative status is still inextricably linked to the actual resources they have. However, that SSS is reliably predictive of mental and physical health has two important implications for policy. First, it represents a simple, yet robust, measure of how differences in status relate to health, possibly as a proxy for SES-related stress. This may be particularly useful in contexts like China where it is difficult to collect complex data on objective economic variables. Second, it provides initial, suggestive evidence that individuals' perceptions of (and feelings about) their place in society operates independently from actual resources—and these perceptions have distinct implications for their health. Additionally, our findings present plausible first evidence that social comparisons of relative status may at least partially mediate how indices of SES are linked with health outcomes in the context of China. Taken together, this suggests that policies should focus on limiting the extent to which experiences of poverty or migration are marginalized; such societal norms of marginalization are likely to fuel individuals' negative perceptions of social status (Walker and Bantebya-Kyomuhendo, 2014).

Limitations and Future Directions

While these findings deepen our understanding of SES and SSS in the context of China, several limitations require attention. First, our data are cross-sectional and prohibit us from investigating potential causal relationships between our variables. This is especially important to consider when interpreting the indirect effects presented in our study. However, while we cannot rule out the possibility of bidirectionality in the relationships between our variables, there is a logical temporal sequence to assuming that experiences of status predicate subjective interpretations of them. Future research needs to emphasize causal

relationships in its methodology as well as the possibility of iterative, transactional relationships. Also, the concept of SES is increasingly understood to mean vastly different things as a function of measurement and context. This may be especially true in the unique context of the two-tiered stratifying system of *Hukou* registration. Future work needs to continue to strengthen the literature on SES in contexts such as China, both in developing more sensitive measures as well as parsing out meaningfully unique cultural and social interpretations of existing measures.

As China continues to face rapid social and economic changes, much research will be needed to understand the implications of these changes on mental and physical health. The present study contributes to this cause by investigating the role of SSS in the relationship between SES and health in a major metropolitan region of China. While our mixed findings regarding SES provide additional evidence that more work is needed to understand the role of objective factors of status in the context of China, we present promising evidence that SSS plays a clear role. Future and continued research on SSS can improve our understanding of how subjective perceptions of relative status might link to increased stress and serve as mechanisms for SES-related health disparities. Taken together, these findings support the relevance of subjective social comparisons in complement to matters of resources and access in the rapidly evolving context of China. While policy and practice should continue to prioritize increasing access and resources to those who are in most need, there is increasing evidence to suggest that psychological processes related to social inequality are also important.

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