

The association between perceived income inequality and subjective well-being:

Evidence from a social survey in Japan

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## **Abstract**

Previous studies have shown that income inequality in society is negatively associated with individuals' subjective well-being (SWB), such as their perceived happiness and self-rated health (SRH). However, it is not realistic to assume that individuals have precise information about actual income distribution measured by the Gini coefficient or other statistical measures. In the current study, we examined how perceived income inequality, rather than actual inequality, was associated with SWB, using cross-sectional data collected from a nationwide, Internet survey conducted in Japan ( $N = 10,432$ ). We also examined how this association was confounded by individuals' objective and subjective income status, considering the possibility that individuals with lower income status are more inclined to both perceive income inequality and feel unhappy/unhealthy. In our analysis, we focused on the perception of a widening income inequality (as perceived income inequality), perceived happiness and SRH (as SWB), and household income and living standards compared with one year ago and compared with others (as income status). We also controlled for personality traits. We obtained three key findings: (1) perceived income inequality was negatively associated with SWB; (2) both perceived income inequality and SWB were associated with income status; and (3) the association between perceived income inequality and SWB was attenuated after controlling for income status, but not fully for perceived happiness. These findings suggest that perceived income inequality, which links actual income inequality to SWB, should be further studied.

## **Keywords**

income status; perceived income inequality; personality traits; self-rated health; subjective well-being

## 1 Introduction

Previous studies have shown that income inequality in a society may negatively affect an individual's subjective well-being (SWB), such as their perceived happiness, life satisfaction, and self-rated health (SRH). Given that income inequality is perceived as being unpleasant and unfavorable, it is likely that it has a separate impact from that of socioeconomic status on individuals' SWB. However, it is not realistic to assume that individuals have precise information about the actual income distribution of their country. In the current study, we examined how *perceived* income inequality, rather than the actual inequality, was associated with SWB, using cross-sectional data collected from a nationwide Internet survey conducted in Japan ( $N = 10,432$ ). We also examined how this association was confounded by individuals' objective and subjective income status.

### 1.1 Background

Previous studies in social epidemiology have addressed how income inequality is associated with SRH and other health outcomes (Subramanian and Kawachi 2004; Wilkinson and Pickett 2006). A large proportion of these studies have offered support for an association between wide income inequality and poor health or SRH; however, they have offered no degree of uniformity across place, time, or survey design. Kondo et al.'s (2009, 2012) meta-analyses found that income inequality tends to have a closer association with health when income inequality exceeds a certain threshold level; furthermore, income inequality tends to be associated with health with a time lag. Their findings point to the importance of the subjective assessment of income inequality, which links actual income inequality to SRH.

Meanwhile, various economic and sociological studies have focused on the association between income inequality and perceived happiness or life satisfaction, another aspect of SWB. Notably, Alesina et al. (2004) found that inequality measures do not much affect individual happiness in the United States, while happiness decreases with increasing inequality—particularly for the poor and left-wing people—in Europe. Their study

implies that the association between income inequality and happiness differs depending on individuals' characteristics and socio-cultural context. Following Alesina et al. (2004), Ebert and Welsch's (2009) cross-country study estimated prevailing inequality aversion among European citizens using microdata on life satisfaction. In Asia, Oshio and Kobayashi (2011) found a negative association between area-level income inequality and happiness in Japan.

These studies used statistical measures, the Gini coefficient in particular, to gauge income inequality. Although it is quite reasonable to use these inequality measures in empirical studies, individuals likely do not have precise information about actual income distribution or its changes. Their perceptions of income inequality depend on their experiences in daily life and information obtained from media, communications with others, or other informal sources. Moreover, the subjective assessment of income inequality may differ across individuals with different socioeconomic statuses and personality traits, even if they actually face the same income inequality.

## 1.2 Research questions

We examined the association between perceived income inequality and SWB—an issue that has received little attention in research—using the data collected from a social survey in Japan. We focused on the respondents' perception of a widening income inequality at the national level in the past five years, considering that individuals would likely need a reference point of past income inequality status in their country to assess the current status. As for SWB, we focused on perceived happiness and SRH, both of which have been widely used as measures of SWB in previous studies; however, few studies have compared their associations with income inequality using a common framework.

Furthermore, we focused on an individual's income status as a potential confounder of the association between perceived income inequality and SWB. Any observed correlation between perceived income inequality and SWB might be exaggerated by their associations with common factors, notably an individual's

income status. It might be possible that individuals with lower income status are more inclined to both perceive income inequality and feel unhappy/unhealthy, making these two subjective measures negatively correlated with each other.

It is widely known and rather understandable that higher income enhances SWB. In addition, Easterlin's (1995, 2005) relative income hypothesis argues that individuals evaluate their current income relative to their past income (habituation) as well as others' income (social comparison) when assessing their well-being. A number of empirical analyses have examined whether this hypothesis holds (Clark et al. 2008). These studies have found that income changes from the past affect individuals' current happiness even after controlling for current income (Burchardt 2005; Clark 1999; Grund and Sliwka 2007); they also have found that comparisons with the mean income of the studied group also matter for people's happiness (Blanchflower and Oswald 2004; Clark and Oswald 1996; Ferrer-i-Carbonell 2005, Oshio et al. 2011).

However, the association of income status, either absolute or relative, with perceived income inequality has yet to be addressed. We can reasonably predict that lower level of income, a reduction in income from the past, and lower income compared with others would make individuals more cautious about income inequality or its increase. Furthermore, individuals with lower income status might be more likely to suspect that income inequality or its increase in a society will expose them to increased poverty risk, even if their income status is not directly determined by overall economic conditions.

Hence, it is of great interest to investigate how income status confounds the association between perceived income inequality and SWB. The correlation between perceived income inequality and SWB, if observed, might be exaggerated by the associations of these two variables with individuals' income status. If that is the case, we should be more cautious in interpreting the association between actual income inequality and SWB. This association might also depend on the overall economic conditions that affect individual income status; for example, negative economic growth might make individuals more cautious about and frustrated by income inequality, even if income inequality remains unchanged from previous years.

In addition, we controlled for personality traits in addition to basic individual attributes (gender, age, and education level), because perceived income inequality, comparisons with one's own past and others' income statuses, and SWB were all subjective variables. We evaluated personality traits using the Big Five Inventory (BFI), which comprises five personality dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness (Benet-Martínez and John 1998). Studies have found that personality traits, especially neuroticism and extraversion, are a key predictor of perceived happiness (Butkovic et al. 2012; Grant et al. 2009; Steel and Ones 2002), SRH (Goodwin and Engstrom 2002; Löckenhoff et al. 2011) and other aspects of SWB. Controlling for personality traits was expected to help examine the confounding effects of an individual's income status with more precision.

### 1.3 Hypotheses

To address these research questions, we tested three hypotheses. First, we hypothesized that perceived income inequality is negatively associated with SWB (H1), a reasonable prediction given that preceding studies have generally provided evidence of a negative association between actual income inequality and SWB. Second, we hypothesized that both perceived income inequality and SWB are associated with an individual's income status (H2); while the association between income status and SWB is widely known, the association between income status and income inequality has not been well researched. If H2 were supported, it would suggest that the correlation between perceived income inequality and SWB, if observed when testing H1, is at least partly exaggerated by the two variables' associations with income status. Hence, we tested the third hypothesis (H3) that the association between perceived income inequality and SWB is attenuated by controlling for income status.

## 2 Methods

### 2.1 Study sample

Data were collected using a nationwide Internet survey in Japan. The survey was designed and administered between February 16 and 22, 2011, for a research project that investigated the socioeconomic determinants of SWB. This survey was sponsored by the Japan Society for the Promotion of Science. The survey provided information about individuals' perceptions of income inequality, SWB, personality traits, and their demographic and socioeconomic statuses.

In order to ensure that the sample was representative of the actual population of Japan, we constructed targeted proportions of 15 population groups, which corresponded to a matrix of five age groups (20s, 30s, 40s, 50s, and 60s or above) and three household income classes (3 million yen or less, 3–6 million yen, and 6 million yen or more). We constructed these population groups based on two official statistical publications: the *Population Census of 2005* and the *Comprehensive Survey of Living Conditions of the People on Health and Welfare of 2009*. Using these targeted sample proportions, we sent questionnaires via the Internet to 16,930 randomly selected people who were registered on the members' list of a private Internet survey institute. We obtained 11,556 responses in total (response rate: 68.3%).

We must note that the data collected from this Internet survey had three important biases. First, the gender proportion was somewhat skewed toward men, who comprised 55.4% of the respondents. Second, the respondents were more educated than the actual population; the percentage of those who had graduated from college or had some higher education was approximately 50.2%, well above the 23.8% of the actual population aged 20–69 years (according to the *Employment Status Survey of 2007*). Third, 35.4% of the respondents lived in the Tokyo Metropolitan Area, which is higher than the 26.8% of the population of Japan who actually live there (according to the *Comprehensive Survey of Living Conditions of the People on Health and Welfare of 2007*). Because of these biases, we must be cautious when interpreting the estimated results; however, of note is that the distributions of age and household income did not differ significantly from the actual distributions.

## 2.2 Measures

### 2.2.1 Perceived income inequality

We considered the respondents' perception of widening income inequality. The survey asked the respondents to answer the question, "Do you think the disparity between the rich and the poor has grown in the past five years in Japan?" on a 5-point scale (1 = *no*; 2 = *if pressed to say, I would say no*; 3 = *I cannot say either way*; 4 = *if pressed to say, I would say yes*; 5 = *yes*). We focused on the respondents' assessments of nation-level rather than community-level inequality, which allowed us to better understand individual-level variations in perceived income inequality. We constructed a binary variable of the perception of widening income inequality by allocating "1" to those who answered *yes* and "0" to all others.

### 2.2.2 Subjective well-being (SWB)

We focused on two measures of SWB: perceived happiness and SRH. Regarding perceived happiness, the question required respondents to rate their overall level of happiness on an eleven-point scale from 1 (*very unhappy*) to 10 (*very happy*). The survey also asked a question about overall health, "How do you describe the current state of your health?" Respondents choose an option from a five-point scale (1 = *unhealthy*; 2 = *if pressed to say, I would say unhealthy*; 3 = *normal*; 4 = *if pressed to say, I would say healthy*; 5 = *healthy*). In the regression analysis, we constructed binary variables of poor SRH and perceived unhappiness, as discussed in 2.3.

### 2.2.3 Income status

We considered three aspects of income status: household income (adjusted to household size), living standards compared with one year ago, and living standards compared with others. Regarding household income, the respondents selected their household income levels from among 14 income bands. We calculated the median for each band and divided it by the root of the number of household members to adjust for

household size. Then, we organized this information into tertiles (low, middle, and high).

We considered two measures of subjectively assessed relative income. The respondents selected from among *better*, *same*, and *worse* in response to the question, “How do you think your current home life compares with how it was one year ago?” The survey also asked the respondent, “How do you think your home life compares with that found in an average home?” on a five-point scale (1 = *far above average*, 2 = *above average*, 3 = *average*, 4 = *below average*, 5 = *far below average*). We condensed the answers into three categories: higher (*much better* or *above average*), average (*average*), and lower (*below average* or *far below average*). Although these income status measures were subjective, it is reasonable to assume that individuals employed more objective and precise information when assessing them than they did for nationwide income inequality.

#### 2.2.4 Personality and covariates

We constructed five binary variables for each of the five personality traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness. The survey asked respondents to rate their agreement with each of the 44 BFI items on a six-point scale (1 = *definitely not*; 2 = *I do not think so*; 3 = *if pressed to say, I would say no*; 4 = *if pressed to say; I would say yes*; 5 = *yes, I think so*; and 6 = *definitely*). We then summed up the indices for each trait and used them as continuous variables. As for covariates, we considered gender, age (20s, 30s, 40s, 50s, and 60s or above) and educational level (graduated from high school or below, junior college or vocational school, and college or above).

#### 2.3 Statistical analysis

We started by analyzing the descriptive statistics to overview the association between perceived income inequality and SWB. We divided respondents into two groups—those who perceived a widening income inequality and others—and examined how mean values of SWB differed between these two groups. We also

performed the nonparametric test for trends across ordered groups developed by Cuzick (1985) to investigate how perceived income inequality and SWB differed across ordered groups of income status.

We then performed a regression analysis, examining the associations between perceived income equality, SWB, and income status by controlling for personality traits as well as other individual attributes to clarify the confounding effects of income status. More specifically, we first estimated four-step hierarchical logit models to explain the perception of widening income inequality by income status measures. In Model 1, we used household income only as an income status measure and controlled for gender, age, and education level. In Model 2, we added personality traits and examined their confounding effect. In Models 3 and 4, we cumulatively added living standards compared with one year ago and those compared with others, respectively.

Second, we estimated logit models to explain each SWB measure by perceived income inequality and income status. To this end, we constructed two binary variables: perceived unhappiness and poor SRH. Perceived unhappiness was defined by having a score between 1 and 5, which shared 21.5% of the sample. The binary variable of poor SRH was constructed by allocating the lowest two categories of SRH (1 = *unhealthy* and 2 = *if pressed to say, I would say unhealthy*), which shared 21.5% of the sample. We then estimated five-step hierarchical logit models, Models 5–9 for perceived unhappiness and Models 10–14 for poor SRH. Regarding perceived unhappiness, we started with Model 5, in which we used the perception of widening income inequality only, controlling for gender, age, and education level. In Model 6, we added personality traits and examined their confounding effect. In Models 7–9, we cumulatively added household income, living standards compared with one year ago, and living standards compared with others. We estimated similar hierarchical logit models, Models 10–14, for poor SRH.

We did not employ ordered logit models using data from the original 5-point- (SRH) or 11-point-scale (perceived happiness) variables. Valid ordered logit (or probit) models assume that the coefficients describing the relationship between, for example, the lowest versus all higher categories of the response variable are the

same as those that describe the relationship between the next lowest category and all higher categories. The results of approximate likelihood-ratio tests (not reported) confirmed that this proportional odds assumption was violated in all cases when estimating the ordered logit models. We found that ordered logit models obtained results similar to those of the above hierarchical logit models.

### **3 Results**

#### 3.1 Descriptive analysis

Table 1 summarizes the respondent characteristics. Table 2 describes how respondents assessed the current situation of income inequality in Japan: 34.5% of respondents perceived that income inequality had risen in the past five years (answered “yes”), and 39.8% accepted this view to some extent. We divided respondents into two groups: those who perceived a widening income inequality (answered “yes”) and others. Table 3 shows how SWB differed between these two groups, without controlling for individual attributes. As clearly seen in this table, levels of both SWB measures were lower for those who perceived a widening income inequality ( $p < .001$ ).

Table 4 shows how perceived income inequality and SWB differed across ordered groups of income status, again without controlling for individual attributes. The top section indicates that as household income decreased, perceived income inequality increased and both aspects of SWB decreased. The middle and bottom sections show the same patterns for living standards compared with one year ago and living standards compared with others, respectively. The trends across the ordered groups were all significant ( $p < .001$ ). A closer look at the table, however, reveals that the differences in perceived income inequality and SWB measures between low- and middle-income statuses were larger than between middle- and high-income statuses.

#### 3.2 Regression analysis

Table 5 summarizes the estimation results of the hierarchical logit regression models to explain the perception of widening income inequality by income status measures. We used perception of widening income inequality as a binary variable, which was constructed by allocating a value of “1” to those who answered “yes” to the question about widening income inequality (see Table 2), and a “0” for all others. The odds ratios (OR), along with 95% confidence intervals (CI) were used to evaluate the associations between perceiving a widening income inequality and each income status, with the average income status used as a reference. The ORs for each personality trait indicate to what extent the odds for perceiving a widening income inequality increased in response to a one-standard-deviation increase from the mean of each variable.

Before controlling for personality traits, Model 1 showed a negative association between perceived income inequality and household income; the ORs were significantly higher than one for the respondents with low income (OR = 1.25, 95% CI = 1.13–1.41), while significantly lower than one for those with a high income (OR = 0.79, 95% CI = 0.71–0.90). This association remained almost intact after controlling for personality traits in Model 2. We also found that the perception of a widening inequality was positively associated with neuroticism, openness, and agreeableness.

Model 3 revealed that the respondents who faced a reduction in living standards from one year ago were much more inclined to perceive a widening income inequality than others, while the ORs of household income remained significant. When including all three measures of income status in Model 4, we found that respondents who assessed their living standards as lower than others were more likely to perceive a widening income inequality than others. Meanwhile, the association between household income and perceived widening income inequality became non-significant. This result probably reflected a correlation between actual household income and living standards compared with others. The ORs of personality traits were almost unchanged across Models 2, 3, and 4. Taken together, the findings in Table 5 confirm that perceived income inequality was negatively associated with income status, both objective and subjective, even after controlling for personality traits.

Tables 6 and 7 summarize the results of hierarchical logit regression models that compared the associations between perceived income inequality and each of the two SWB measures both before and after controlling for personality traits and income status measures. The dependent variables were perceived unhappiness (Table 6) and poor SRH (Table 7), used as binary variables. In Table 6, we observed from the results of Models 5 and 6 that the OR of perceived widening income inequality remained highly significant (OR = 2.12, 95% CI = 1.89–2.37), even after controlling for personality traits. Hence, we can argue that their observed correlations in Table 3 were not attributable to personality traits. Regarding personality traits, extraversion, agreeableness, conscientiousness were negatively associated with perceived unhappiness, while neuroticism was positively associated with it.

After adding the income status measures in Models 7–9, we found that the ORs of perceived widening income inequality gradually declined but remained significant (OR = 1.50, 95% CI = 1.33–1.69). Similar to the results in Table 5, respondents with lower income status tended to feel unhappy. When including all three measures of income status in Model 9, the ORs of household income became non-significant, a similar pattern observed in Table 5. The associations between each personality trait with perceived happiness remained almost the same across all models in Table 6.

Table 7 presents the results for poor SRH, which shows patterns similar to those for perceived unhappiness in Table 6. First, we found that even after controlling for personality traits in Model 11, the perception of widening income inequality remained significant (OR = 1.30, 95% CI = 1.17–1.45), although the association was somewhat lower than that for perceived unhappiness. Second, including the income status variables cumulatively reduced the association (OR = 1.11, 95% CI = 0.99–1.24) in Model 14, which was non-significant at the 5% level but significant at the 10% level ( $p = .078$ ). As for income status, low household income, worsened living standards from a year ago, and lower living standards than others were positively associated with poor SRH. Regarding personality traits, we found that poor SRH was positively associated with neuroticism and openness, and negatively associated with extraversion, and that these associations were

almost the same across the models, as was true for perceived unhappiness.

#### **4. Discussion and conclusions**

In this study, we tested three hypotheses—H1: perceived income inequality is negatively associated with SWB; H2: both perceived income inequality and SWB are associated with income status; and H3: the association between perceived income inequality and SWB is attenuated by controlling for income status—using data collected from a nationwide Internet survey in Japan. The results supported all three hypotheses.

First, as seen in Table 1, both SRH and perceived happiness significantly differed between those who perceived widening income inequality and those who did not. This result was confirmed by the logit regression models in Tables 6 and 7. That H1 was supported suggests that the subjective assessment of income inequality affects individuals' SWB, separately from objective income inequality. This result is analogous to findings in previous studies that individuals' perceptions of a neighborhood affect their health, separately from objective neighborhood conditions (Bowling and Stafford 2007; Fagg et al. 2008; Weden et al. 2008). It is also noteworthy that the association between perceived income inequality and SWB, both of which were subjectively measured, remained significant even after controlling for personality traits. This finding is similar to the results in previous studies that individuals' perceptions of a neighborhood affect their SWB, even after controlling for personality traits (Oshio and Urakawa 2012).

Second, Tables 4–7 supported H2, indicating that perceived income inequality and SWB were associated with income status. Table 4 showed that as income status—measured by household income, living standards compared with one year ago, and compared with others—decreased, perceived income inequality increased and SWB declined. The associations between income status with perceived income inequality and two SWB measures were confirmed by regression analysis, as shown in Tables 5–7. These results are consistent with the view that individuals with lower or declining income status are more likely to perceive a widening income

inequality, even if the inequality does not actually widen. A plausible interpretation of this result is that individuals with lower income status tend to think that income inequality or its increase in society exposes them to greater poverty risks and deprivation, even if their income status is not directly related to overall economic conditions.

These findings suggest that income inequality is more likely to become a social concern when the economy is contracting than when it is expanding, because a contracting economy lowers household income and living standards in general. Table 2 showed that nearly three fourths of respondents had the perception of a widening income inequality, in line with a widespread view in Japan that the country is now an uneven society (Tachinabaki 2005). In reality, however, the Gini coefficients for household-size-adjusted, disposable (i.e., after taxes and transfers) income have exhibited a see-saw pattern within a relatively narrow range in recent years (0.337 in 1998, 0.323 in 2001, 0.322 in 2004, and 0.327 in 2007) according to government statistics (Ministry of Health, Labour and Welfare 2010). This discrepancy between actual income inequality and people's perception of inequality seems to be at least partly attributable to the country's economic downturn in recent years; nominal gross domestic product (GDP) per capita dropped 9.3% over five years to 2010 (one year before the survey year).

It might be also possible that the association between income status and SWB depends on social context. Individuals with lower income status might feel more frustrated with income inequality than others, when they are living in a society that has less mobility; this is because income inequality implies that they will have limited chances to move up from their current status. Alesina et al. (2004) found that income inequality has a stronger association with perceived happiness among low-income Europeans, but not among low-income Americans. They argued that these findings were consistent with the perception that Americans live in a mobile society while Europeans live in less mobile societies. The results in the current study were supportive of the view that Japan is not a mobile society, which is another interesting issue to be addressed in future research.

The third notable finding was that the association between perceived income inequality and SWB was attenuated after we controlled for income status. This was supportive of H3 and consistent with our result that perceived income inequality and SWB were both associated with income status. Individuals with lower income status were more inclined to be sensitive to income inequality, and at the same time, to feel unhappy and unhealthy. Hence, we can conclude that the observed association between perceived income inequality and SWB tends to be overstated.

However, it should be noted that the association between perceived income inequality and perceived unhappiness remained highly significant even after controlling for income status. Furthermore, while the association between perceived income inequality and SRH after controlling for income status was not significant at the 5% level, it was significant at the 10% level. Considering that we also controlled for personality traits as well as other covariates, we can reasonably argue that there was significant association between perceived income inequality and SWB, thus confirming H1.

We recognize that this study has several limitations. First, our analysis draws on a cross-sectional dataset, which makes identifying causality between the measures nearly impossible. Second, the data had a number of biases inherent to an Internet survey, as noted in 2.1. Third, individuals might be more cautious about regional income inequality than nationwide inequality, even though the survey explicitly asked about their assessment of the latter. Fourth, the reference groups for comparing income should be more clearly identified to assess the effect of relative income on SWB. However, in general, our findings suggest that perceived income inequality should be further studied, because it can link actual income inequality to SWB and possibly explain the non-uniform relationships observed in previous studies.

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**Table 1. Respondent characteristics (N = 10,432)**

	<i>Proportion of sample (%)</i>			<i>Level</i>		
Gender	Male	42.6	Household income (million yen)	<i>M</i>	3.86	
	Female	57.4		<i>SD</i>	2.82	
Age	20s	17.7	Perceived happiness (categorical, range: 1–11)	<i>M</i>	7.10	
	30s	22.0		<i>SD</i>	2.10	
	40s	19.0	Extraversion (range: 1–6)	<i>M</i>	3.25	
	50s	22.5		<i>SD</i>	0.70	
Education level	60s or above	18.8	Agreeableness (range: 1–6)	<i>M</i>	4.05	
	High school	28.3		<i>SD</i>	0.56	
	Junior college	21.4		<i>M</i>	3.83	
Household income	College	50.4	Conscientiousness (range: 1–6)	<i>SD</i>	0.65	
	Low	28.3		Neuroticism (range: 1–6)	<i>M</i>	3.52
	Middle	33.6			<i>SD</i>	0.63
Living standards compared with one year ago	High	38.1	Openness (range: 1–6)	<i>M</i>	3.56	
	Worse	24.8		<i>SD</i>	0.69	
	Same	68.9				
Living standards compared with others	Better	6.3				
	Lower	39.1				
	Same	40.7				
	Higher	20.3				

**Table 2. Distribution of perceived widening income inequality**

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*Do you think the disparity between the rich and the poor has grown in the past five years in Japan?*

“Yes.”	34.5%
“If pressed to say, I would say yes.”	39.8%
“I cannot say either way.”	17.2%
“If pressed to say, I would say no.”	6.9%
“No.”	1.6%

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**Table 3. Comparison of subjective well-being between respondents who perceived a widening income inequality and those who did not**

		Perceived happiness (1 = <i>unhappy</i> to 11 = <i>happy</i> )			Self-rated health (SRH) (1 = <i>unhealthy</i> to 5 = <i>healthy</i> )		
		Mean	Difference	<i>p</i> -value	Mean	Difference	<i>p</i> -value
“Yes” (perceived)	(34.5%)	6.64			3.30		
Other answers <sup>a</sup>	(65.5%)	7.25	-0.61	< .001	3.49	-0.19	< .001
All		7.10			3.44		

Note: <sup>a</sup> Answers to the questions except for “Yes,” quoted in Table 2.

**Table 4. Comparison of perceived income inequality and subjective well-being by income status<sup>a</sup>**

	Household income			<i>p</i> for trend
	Low	Middle	High	
Perception of widening income inequality <sup>b</sup>	0.273	0.245	0.225	< .001
Perceived happiness <sup>c</sup>	6.57	7.14	7.54	< .001
Self-rated health <sup>d</sup>	3.30	3.48	3.54	< .001
<i>n</i>	3,359	3,351	3,563	
	Living standards compared with one year ago			<i>p</i> for trend
	Worse	Same	Better	
Perception of widening income inequality <sup>b</sup>	0.388	0.200	0.204	< .001
Perceived happiness <sup>c</sup>	5.97	7.41	8.08	< .001
Self-rated health <sup>d</sup>	3.09	3.54	3.76	< .001
<i>n</i>	2,585	7,185	662	
	Living standards compared with others			<i>p</i> for trend
	Lower	Average	Higher	
Perception of widening income inequality <sup>b</sup>	0.335	0.191	0.188	< .001
Perceived happiness <sup>c</sup>	6.07	7.51	8.25	< .001
Self-rated health <sup>d</sup>	3.16	3.58	3.72	< .001
<i>n</i>	4,074	4,242	2,116	

Notes: <sup>a</sup> Compared the means of each variable by income status and calculated *p* for trend.

<sup>b</sup> “Yes” =1; other answers = 0 (see Table 2).

<sup>c</sup> 1 = *unhappy* to 11 = *happy*.

<sup>d</sup> 1 = *unhealthy* to 5 = *healthy*.

**Table 5. Results of the hierarchical logit regression analysis for perceived income inequality and income status<sup>a</sup>**

Dependent variable = perception of widening income inequality		Model 1		Model 2		Model 3		Model 4	
		OR	95% CI						
<i>Income status</i>									
Household income	Low	1.25	(1.13–1.41)	1.24	(1.11–1.38)	1.16	(1.04–1.30)	1.05	(0.94–1.18)
	Middle	1		1		1		1	
	High	0.79	(0.71–0.90)	0.79	(0.71–0.89)	0.86	(0.76–0.96)	0.96	(0.85–1.08)
Living standards compared with one year ago	Worse					2.35	(2.12–2.60)	2.02	(1.82–2.25)
	Same					1		1	
	Better					1.13	(0.92–1.38)	1.14	(0.93–1.40)
Living standards compared with others	Lower							1.73	(1.55–1.93)
	Average							1	
	Higher							0.98	(0.85–1.12)
<i>Personality traits<sup>b</sup></i>									
Extraversion				0.98	(0.93–1.04)	0.98	(0.93–1.04)	1.01	(0.95–1.06)
Agreeableness				1.14	(1.08–1.21)	1.13	(1.07–1.20)	1.14	(1.07–1.20)
Conscientiousness				1.00	(0.94–1.07)	1.00	(0.95–1.08)	1.03	(0.96–1.10)
Neuroticism				1.24	(1.17–1.32)	1.24	(1.12–1.26)	1.18	(1.11–1.25)
Openness				1.20	(1.14–1.27)	1.20	(1.13–1.27)	1.19	(1.13–1.26)

Notes: <sup>a</sup> Gender, age, and education level were controlled for in all models.

<sup>b</sup> Odds ratios (ORs) for personality traits indicate how much the odds for poor self-rated health increased in response to a one-standard-deviation increase from the mean for each variable.

**Table 6. Results of the hierarchical logit regression analysis for perceived income inequality and perceived unhappiness<sup>a</sup>**

Dependent variable	Model 5		Model 6		Model 7		Model 8		Model 9	
	OR	95% CI								
= perceived unhappiness										
Perception of widening income inequality	2.18	(1.96–2.43)	2.12	(1.89–2.37)	2.04	(1.82–2.28)	1.67	(1.48–1.88)	1.50	(1.33–1.69)
<i>Income status</i>										
Household income	Low				1.52	(1.35–1.72)	1.40	(1.23–1.59)	1.12	(0.98–1.28)
	Middle				1		1		1	
	High				0.74	(0.64–0.85)	0.82	(0.71–0.94)	1.15	(0.99–1.34)
Living standards compared with one year ago	Worse						3.57	(3.18–4.01)	2.61	(2.32–2.95)
	Same						1		1	
	Better						0.86	(0.66–1.11)	0.91	(0.69–1.19)
Living standards compared with others	Lower								3.52	(3.08–4.02)
	Average								1	
	Higher								0.58	(0.46–0.73)
<i>Personality traits<sup>b</sup></i>										
Extraversion			0.75	(0.70–0.80)	0.76	(0.71–0.81)	0.74	(0.70–0.79)	0.78	(0.73–0.84)
Agreeableness			0.90	(0.85–0.96)	0.90	(0.85–0.96)	0.89	(0.83–0.95)	0.90	(0.84–0.96)
Conscientiousness			0.94	(0.86–0.99)	0.94	(0.87–1.01)	0.95	(0.88–1.02)	0.98	(0.91–1.06)
Neuroticism			1.55	(1.44–1.66)	1.54	(1.44–1.65)	1.49	(1.39–1.60)	1.48	(1.38–1.59)
Openness			1.02	(0.96–1.09)	1.03	(0.97–1.09)	1.03	(0.96–1.10)	1.02	(0.96–1.09)

Notes: <sup>a</sup> Gender, age, and education level were controlled for in all models.

<sup>b</sup> Odds ratios (ORs) for personality traits indicate how much the odds for poor self-rated health increased in response to a one-standard-deviation increase from the mean for each variable.

**Table 7. Results of the hierarchical logit regression analysis for perceived income inequality and poor self-rated health<sup>a</sup>**

Dependent variable		Model 10		Model 11		Model 12		Model 13		Model 14	
		OR	95% CI								
= poor self-rated health											
Perception of widening income inequality		1.43	(1.29–1.59)	1.30	(1.17–1.45)	1.27	(1.14–1.42)	1.15	(1.03–1.29)	1.11	(0.99–1.24)
<i>Income status</i>											
Household income	Low					1.40	(1.25–1.58)	1.34	(1.19–1.51)	1.26	(1.11–1.42)
	Middle					1		1		1	
	High					0.95	(0.84–1.08)	0.99	(0.87–1.13)	1.05	(0.92–1.20)
Living standards compared with one year ago	Worse							1.76	(1.57–1.96)	1.60	(1.43–1.79)
	Same							1		1	
	Better							0.87	(0.69–1.10)	0.87	(0.69–1.09)
Living standards compared with others	Lower									1.50	(1.33–1.68)
	Average									1	
	Higher									1.11	(0.96–1.29)
<i>Personality traits<sup>b</sup></i>											
Extraversion				0.92	(0.87–0.98)	0.93	(0.88–0.99)	0.93	(0.88–0.99)	0.92	(0.89–1.00)
Agreeableness				1.02	(0.96–1.09)	1.02	(0.97–1.09)	1.02	(0.96–1.08)	1.02	(0.96–1.09)
Conscientiousness				0.96	(0.90–1.03)	0.97	(0.91–1.04)	0.97	(0.91–1.04)	0.96	(0.92–1.05)
Neuroticism				1.76	(1.65–1.88)	1.75	(1.65–1.87)	1.76	(1.62–1.84)	1.76	(1.61–1.83)
Openness				1.12	(1.05–1.18)	1.12	(1.05–1.18)	1.12	(1.06–1.19)	1.12	(1.05–1.18)

Notes: <sup>a</sup> Gender, age, and education level were controlled for in all models.

<sup>b</sup> Odds ratios (ORs) for personality traits indicate how much the odds for poor self-rated health increased in response to a one-standard-deviation increase from the mean for each variable.