

## Increasing Income Inequality, External Habits, and Self-Reported Happiness

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A large literature has documented an increase in income equality in the United States over the past several decades (see, for example, David H. Autor, Lawrence F. Katz, and Melissa S. Kearney 2006). At the same time, real aggregate income has risen markedly, and most socioeconomic groups have experienced at least some rise in real purchasing power. Standard models of consumption, which typically assume that an individual's utility is based only on her own consumption, would predict that these gains have led to higher levels of happiness for all groups, albeit with greater increases for some more than others. Economists have long recognized, however, that an individual's utility may depend not only on the level of her own consumption but also on how that level compares with the consumption of others. If preferences are characterized by such "external habits," then the observed widening of the income distribution may have implications for the happiness of different groups that go beyond those associated with the changes in their respective incomes.

This study combines data from two sources to document the evolution of reported levels of happiness for different socioeconomic groups over the past 25 years and to explore whether those levels have been affected by the changing relative position of these groups within the

income distribution. We find that people's happiness appears to depend positively on how well their group is doing relative to the average in their geographic area, even after controlling for the level of their own income. This result is consistent with evidence in earlier work by Erzo F. P. Luttmer (2005) and Ravina (2005). In addition, we find some evidence that the relationship is much stronger for people whose group has above-average income than for people whose group has below-average income. It would thus appear that relative concerns do not become an issue until a person has attained a certain place within the income distribution.

### I. Empirical Framework

Consider the simple formulation of preferences:

$$U = u(c_{it} - \gamma C_t; \Theta_{it}).$$

Utility of individual  $i$  in period  $t$  is assumed to depend not only on her own consumption,  $c_{it}$ , but also on the consumption of a reference group,  $C_t$ , as well as individual-specific taste-shifters,  $\Theta_{it}$ .

Previous literature has tested whether  $C_t$  matters for individual utility in a variety of ways. For example, Ravina specified a functional form for utility and estimated  $\gamma$  based on a Euler equation framework. She found  $\gamma$  to be in the range of one-fourth and one-third for a sample of credit-card holders whose reference group was the other residents of their cities. Luttmer took a more direct approach, and looked at the relationship between self-reported happiness in two waves of the National Survey of Families and Households and income measures, which he assumes to proxy for consumption. He found that happiness falls with an increase in neigh-

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borhood income (with the absolute size of the effect on par with the positive effects of a comparable increase in one's own income).

Building on Luttmer, we relate self-reported happiness to income measures and other variables. One shortcoming of this approach is the focus on income rather than consumption as a determinant of happiness. To be sure, income is closely related to consumption for many households, and some studies (such as Orazio Attanasio, Erich Battistin, and Hidehiko Ichimura 2004) have suggested that consumption, like income, has become more unevenly distributed in the United States over time. But, consumption can deviate from income for many reasons. For example, if an individual's income is lagging that of his peers on a transitory basis, consumption-smoothing behavior should imply a smaller deviation in his consumption from reference levels than for income. In future work, we plan to combine data on consumption from the Consumer Expenditure Survey with the other data used in this paper.

In order to draw conclusions about the effects of long-term trends in income inequality on utility, our measures of happiness are drawn from the General Social Survey (GSS) conducted by the National Opinion Research Center.<sup>1</sup> The GSS was conducted in almost every year between the early 1970s and the early 1990s and in every other year since 1994. For each wave, several thousand households were asked for their views about a wide range of social, cultural, and political issues, and for information about their demographics and conditions in their households. We also obtained information about where respondents reside, after agreeing to certain conditions to protect such data. For our analysis, we used responses to the question: "Taken all together, how would you say things are these days? Would you say that you are very happy, pretty happy, or not too happy?" We assigned values of 3, 2, and 1 to the respective answers so that higher values corresponded to more happiness.

Our measure of household income is respondents' real income, as reported in the GSS. Both

Luttmer and Ravina find that individuals compare themselves to those who are geographically close to them. Deriving relative income by simply comparing respondents' income to a geographic average, however, would not be sensible in the GSS. One problem is that the GSS sample is too small to make geographic averages meaningful. Another problem is that individual respondents' incomes in the GSS are measured with even more error (see Michael McBride 2001), so any gap would reflect measurement problems more than true relative income.

Therefore, we construct our measure of relative income using earnings information from the Current Population Survey Annual Earnings Files. In particular, we take the difference between:

- the average value of log real earnings within a person's education and occupation and state and year, and
- the average value of log real earnings within a person's state and year,

where occupation is divided into six categories and education into four categories. Note that it is not appropriate to compare the coefficients that we estimate on household income and relative income, because household income has measurement error (and thus its coefficient will suffer from attenuation bias), and because the measures of income are conceptually different (we use labor earnings from the CPS, but the GSS reports total income).

Of course, socioeconomic characteristics could play a role in defining reference populations. In fact, such benchmarks could dominate geographic proximity today, given advances in communications technology. We do not attempt to estimate effects for different types of reference populations, however.

Figure 1 shows the standard deviation of our relative income measure over time. If the increase in overall income variance had occurred entirely *within* education and occupation groups rather than between groups, or entirely *between* states rather than within them, then our relative income measure would reflect none of the overall increase in income variance. These possibilities are far-fetched and inconsistent with earlier research, however, and our relative income measure shows a gradual increase in its standard deviation over time.

<sup>1</sup> A more detailed description of our data sources, as well as the construction of the variables, is available at [www.e-aer.org/data/may07/P07072\\_app.pdf](http://www.e-aer.org/data/may07/P07072_app.pdf).

TABLE 1—BASIC RESULTS

Variable	(1)	(2)	(3)
Log(real income)	0.025*** (0.002)	0.025*** (0.002)	0.023*** (0.002)
Relative income	0.030*** (0.008)	0.125*** (0.019)	0.085*** (0.019)
Relative income * (relative income < 0)		−0.153*** (0.028)	−0.095*** (0.028)
State fixed effects	No	No	Yes
R-squared	0.058	0.058	0.102

Notes: All specifications also include age, gender, race, education, marital status, and family size. Standard errors are shown in parentheses.

\*\*\* Indicates significance at the 1 percent level.

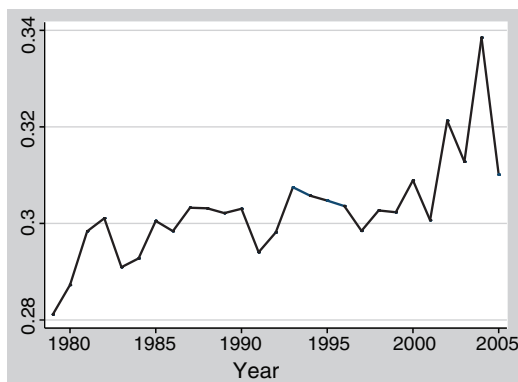


FIGURE 1. STANDARD DEVIATION OF EDUCATION-OCCUPATION GROUP INCOME LESS STATE AVERAGE INCOME

Note. Both income measures in logs.

We use these data to estimate

$$H_{it} = \rho_0 + \rho_1 y_{it} + \rho_2 Yrel_{it} + \rho_3 \Phi_{it} + \varepsilon_{it},$$

where  $H_{it}$  corresponds to respondent  $i$ 's reported happiness in year  $t$ ,  $y_{it}$  corresponds to the log of respondent's income in that year,  $Yrel_{it}$  corresponds to relative income as described above,  $\Phi_{it}$  corresponds to a vector of control variables, and  $\varepsilon_{it}$  is an error term. For control variables we use age, gender, race, education, marital status, and family size; the results are insensitive to including additional variables such as health and employment status. We excluded retired households, households with missing data, and households where the respondent is self-employed or never worked. We were left with about 60,000

person-year observations, covering the period 1979 through 2004.

## II. Results

The results from estimating the preceding equation are shown in Table 1. For the control variables (not shown), higher levels of happiness are reported by females, married people, older people, people in smaller families, and people with more education. The estimated coefficients on these variables are generally statistically significant and are not strongly affected by any of the changes in the specification shown. As indicated by the R-squared statistics, the complete set of variables included in the regression explains only a small share of the total variation in reported happiness.

For all of the specifications shown, an increase in a person's own income raises his or her reported happiness in a statistically significant manner. The estimated coefficients are not large—a 10 percent increase in income increases happiness by only about 0.0025—but they are held down by measurement error and by the inclusion of other variables (such as education) that affect income. The income of a person's education-occupation group relative to the average in his or her state also has a positive and statistically significant effect on happiness in all of the specifications, corroborating findings in earlier studies that perceived well-being depends on relative as well as absolute income.<sup>2</sup>

<sup>2</sup> Note that because equation (2) was not derived formally, the estimated coefficient does not inform us about

TABLE 2—ROBUSTNESS CHECKS

Variable	(1)	(2)	(3)
Log(real income)	0.023*** (0.002)	0.023*** (0.002)	0.023*** (0.002)
Relative income	0.112*** (0.017)	−0.039** (0.017)	0.019 (0.017)
Relative income * (relative income < 0)	−0.135*** (0.026)	0.057*** (0.021)	−0.090*** (0.021)
State fixed effects	Yes	Yes	Yes
R-squared	0.102	0.101	0.102

*Notes:* All specifications also include age, gender, race, education, marital status, and family size. Compared with the third specification in Table 1, specification (1) uses a relative income variable based on medians rather than means; specification (2) uses a relative income variable based on means within education-occupation groups and ninetieth percentiles within states; and specification (3) uses a relative income variable based on industry-occupation groups. Standard errors shown in parentheses.

\*\*\* Indicates significance at the 1 percent level.  
\*\* Indicates significance at the 5 percent level.

Next, we explore asymmetries in the effect of relative income by adding a term that interacts relative income with a dummy variable for whether relative income is negative. In the second column, the coefficient on the interaction term is statistically significant and fairly close to the coefficient on relative income, but it has the opposite sign. The implication is that the happiness of people in groups with below-average earnings is little affected by how much their earnings differ from the average, while the happiness of people in groups with above-average earnings is considerably affected by how much their earnings outperform the average. In particular, when average earnings increase relative to their group’s earnings—and holding constant their own income—their happiness increases.

The third column adds state fixed effects. Their inclusion boosts the R-squared statistic and reduces the absolute value of the estimated coefficients on both relative income and the interaction term. The coefficients remain statistically significant, however, and the qualitative implications regarding relative income and happiness are unaffected.

Table 2 explores the robustness of these conclusions to several variations in the framework.<sup>3</sup>

Building on the final specification in Table 1, the first specification in this table compares the median income (rather than mean income) of a person’s education-occupation-state group to the median income (rather than mean income) in his or her state. The results are qualitatively very similar.

The second specification compares the mean income of a person’s education-occupation-state group to the ninetieth percentile of income in his or her state. This specification captures the notion that people may not care so much about how they compare with their average neighbor but rather how they compare with the richest members of their community. The coefficient on the relative income term is small although significantly different from zero, indicating that the happiness of individuals whose group income is above the ninetieth percentile is little affected by a further increase in their income relative to the ninetieth percentile. On the contrary, individuals below this point do care to improve their position relative to the benchmark. Taken together with the results in Table 1 and in the first column of Table 2, one potential interpretation is that relative concerns primarily affect people who have an above-average income but are not extremely rich.

the strength of external habits and cannot be compared with estimates such as Ravina’s that directly map into parameters from a specific utility function.

<sup>3</sup> We considered several other specifications beyond those presented in Table 2. The results were robust to

dividing households using finer occupation categories and to controlling for unemployment and house prices in the respondent’s state.

The third specification compares average earnings within industry-occupation-state groups (rather than education-occupation-state groups) to average earnings in each state. The results are puzzling, with higher relative earnings reducing happiness for people in groups with above-average income. It is difficult to unravel the underlying feature of our data that drives the result, but we suspect the results may be spurious—with 6 occupation categories and 14 industry categories, some of the state-specific cells on which we base group relative income are very small. In any event, we are inclined to discount these results because the importance of education to changing income inequality in the United States suggests that education needs to be included as a characteristic used to define groups for our purposes.

### III. Discussion

Our results represent a first look at whether self-reported happiness can be related to differences in relative incomes over the past 25 years, as would be suggested by a model in which utility depends on external habits. The results are consistent with the view that happiness is higher the greater one's income is relative to one's neighbors, with the effect concentrated among those with above-average incomes. We caution, though, that the results could also be explained by our relative income measure capturing factors that affect happiness through channels for which we have not been able to control; future work should explore this possibility further. Given these concerns and the fairly complex pattern of changing relative incomes in the United States, we do not attempt to use our results to quantify the precise effect of increasing income inequality on the overall happiness of US residents. However, the results do suggest that the evolution of aggregate well-being may have a far more complicated relationship with income dynamics than traditional analyses would suggest.<sup>4</sup>

The results could be corroborated by looking for evidence that trends in relative income affect

the behavior of different groups in ways suggested by previous theoretical work on external habits such as studies by Christopher D. Carroll, Jody Overland, and David N. Weil (1997) and Bill Dupor and Wen-Fang Liu (2003). One possibility is that consumption externalities induce households to consume more than they might otherwise choose by increasing their labor supply or taking on more debt. If the benefits of doing so are larger relative to the costs for households that have fallen behind the reference population, then one might expect to see these households supply more labor or take on more debt than others. Further, if consumption comparisons matter because of their implications for one's perceived "position" in society, as in Ori Heffetz (2006), then one might see the lagging groups choosing to tilt their basket of consumption toward goods and services that are more visible. In evaluating the evidence for these hypotheses, one should be able to further assess the effects of the widening income distribution on particular features of the macroeconomy and draw conclusions for the nature of the mechanism that relates happiness to relative earnings.

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<sup>4</sup> One implication is that it may be more practical to capture the evolution of society's well-being through direct measures rather than an income-based analysis. See Daniel Kahneman and Alan B. Krueger (2006) for a discussion of such measures.

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