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INCOME AND HAPPINESS IN THE UNITED STATES

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Note to Taiwan group: Would it be possible to replicate this analysis with income data for Taiwan?

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INCOME AND HAPPINESS IN THE UNITED STATES

ABSTRACT

Richer people tend to be happier than poorer people. What we don't know is whether the income effect results largely from the things money can buy (absolute income effect) or from comparing one's income to the income of others (relative income effect). If income effects are entirely relative after basic physiological needs are satisfied, then continued income growth in much of the world today is irrelevant to how happy people are on the whole. Aside from laboratory experiments, however, there is little individual-level evidence on this issue because it is difficult to identify income peer groups in natural settings. Following Easterlin we argue that, in evaluating their own incomes, individuals compare themselves in the first place to others of the same age. Using comparison groups formed on the basis of age, we find evidence of both relative and absolute effects, but relative income is more important than absolute income in determining the happiness of individuals in the United States.

INCOME AND HAPPINESS IN THE UNITED STATES

Studies over the past half-century consistently find that richer people tend to judge the overall quality of their lives more favorably. This positive association between income and happiness has been widely reported in psychology (Argyle 1999; Diener, Sandvik, Seidlitz and Diener 1993), in economics (Easterlin 1974, 2001; Frey and Stutzer 2002), and in sociology (Davis 1984: Firebaugh 2003, figure E-1; Hout 2003; Oropesa 1995). Richard Easterlin (2001, p. 468) writes that "As far as I am aware, in every representative national survey ever done a significant positive relationship between happiness and income has been found." The relationship has been observed in the United States (Easterlin 2001), in Sweden (Gerdtham and Johannesson 2001), in Switzerland (Frey and Stutzer 2000), in the member countries of the European Union (Di Tella, MacCulloch and Oswald 2001), in Russia (Graham and Pettinato 2002, table 4-5), and in pooled data for 17 Latin American countries (Graham and Pettinato 2002, table 4-1). ASIAN EXAMPLES? The evidence is so strong that there is little debate among scholars any more over whether richer people are, on average, happier.

There is however an ongoing debate over *why* richer people are happier. One school of thought emphasizes the instrumental or hedonic value of income. The more money one has, the more one can purchase, from food to housing to travel, and it is the consumption of these goods that increases one's enjoyment of life and one's sense of well-being. We call this the *absolute effect* of income because in this view happiness depends only on one's own income, and not on the income of others. A popular alternative view is that the income effect is relative, that is, that one's satisfaction (or dissatisfaction) from income derives from comparing one's income to the income of others. If income effects are entirely relative, rising income results in greater happiness only if one's income is rising faster than the income of one's peers.

Although absolute and relative income effects are sometimes posed as alternatives, income could have both sorts of effects at the same time, and the task of the researcher is to estimate them both. The task has proved to be surprisingly difficult, however (see Diener, Sandvik, Seidlitz and Diener 1993). The observed association between income and happiness must be decomposed, since it conflates the two types of effects. This article proposes a method for separating relative and absolute income effects with individual-level data, and employs that method to estimate the magnitude of relative and absolute income effects in the United States.

Why does it matter how large income effects are, and whether they are absolute or relative? These questions are important first because of unprecedented economic change and income growth over the last two centuries (Bourguignon and Morrisson 1992, Table 1). If one's subjective well-being depends largely on one's income, and income effects are absolute, then the average world citizen today should be enjoying significantly higher subjective well-being than the average citizen in the early nineteenth century. On the

other hand, if income effects are entirely relative everywhere, then world income growth is irrelevant to the subjective well-being of the average citizen in the world, no matter how large the income effect at the individual level.[1]

In addition, as Robert Frank points out, relative income effects can trigger a "consumption arms race" akin to military arms races (Frank 1997). That is, if your consumption lowers my happiness, then I must consume more to keep up. As a result, we all end up consuming more than is socially optimal. Because consumption uses up resources, we would all be better off if we consumed less and released those resources for other purposes that more effectively promote our happiness, such as more resources devoted to community endeavors, or more time spent with friends and family. The consequences for society are perverse, then, when relative income effects dominate.

RELATIVE INCOME EFFECTS

After noting that "In economics textbooks, satisfaction springs only from a man's own income," Lester Thurow (1973, p. 69) states that "In the real world, relative incomes seem to dominate absolute incomes in terms of making people satisfied or dissatisfied." The importance of relative judgments for happiness has been amply demonstrated in laboratory studies (Smith, Diener, and Wedell 1989; Tversky and Griffin 1991 – ** check both). Demonstrating relative income effects has proved to be somewhat more difficult in observational studies (for example, Diener, Sandvik, Seidlitz and Diener 1993; but see Clark and Oswald 1996; Hagerty 2000; McBride 2001), where reference groups cannot be directly manipulated. Most agree, however, that relative income effects exist, and are important, in the real world. The theoretical case for relative income effects rests largely on two principles: the principle of social comparison and the principle of growing social needs.

Social Comparison Principle

The social comparison principle is illustrated by this statement attributed to Karl Marx (quoted in Lipset 1960, p. 63):

> A house may be large or small; as long as the surrounding houses are equally small it satisfies all social demands for a dwelling. But if a palace rises beside the little house, the little house shrinks into a hut.

Social comparison involves calibration and affect. We use the statuses or positions of others as a measuring device, to calibrate our own position. "How am I doing?" is a question we do not answer in a vacuum; instead, we compare ourselves with others. We

[1] A third possibility is that income effects are absolute, but small relative to the other determinants of happiness. In that case it is not possible to predict whether rising income will be associated with rising happiness over time, since the salutary effects of rising income might be overshadowed by other, stronger, effects.

see that our house is little compared to the palace beside it -- calibration. Marx's observation that our house "shrinks into a hut" after the palace arises beside it illustrates the affect component of social comparison: We are not dispassionate about the results of our calibration.

Social calibration – the notion that we learn about and evaluate ourselves by comparing ourselves to others – has an illustrious history in social science. Prompted by the findings of Stouffer et al. (1949) regarding the centrality of reference groups to the formation of soldiers' attitudes in World War II, several classic sociological studies of the mid-20th century (e.g., Merton and Kitt 1950) focused on the question of comparison to whom – which "others" do we compare ourselves to? These issues surfaced at the same time in economics in James Duesenberry's (1949) classic study of consumer behavior, which theorized that those who associate with higher-income people are less satisfied with their income than are those who associate with others at the same income level. In sociology the importance of reference groups has been demonstrated in a number of different settings. For example, James Davis's (1966) paper on frog pond effects showed how the notion of reference groups applies to the selection of college. Because "success is judged by relative standing in the social group, not by standing in the total population" (Davis 1966, p. 25), some students might be better off to choose less competitive colleges – smaller ponds where they would be relatively bigger frogs.

Principle of Growing Social Needs

It is commonplace to distinguish *needs* from *wants*, and to argue that needs can be met whereas wants are insatiable. That claim, however, best refers to biological needs, which in principle can be satiated, such as the need for food. The claim that needs are more or less fixed (and thus can be met) is less compelling in the case of *social* needs, by which we mean those items that are necessary for full participation in one's local community. As argued particularly by Amartya Sen (****), social needs are not fixed, but tend to rise with a community's level of income. A bicycle, for example, might suffice to participate fully in community life in a farm village in rural India, whereas a car is necessary to participate in community life in the rural United States. In the case of social needs, what was unavailable or considered to be a luxury in earlier times (e.g. a telephone or an automobile) might be a social necessity today, as Adam Smith (Wealth of Nations, vol. 2, book V, chapter 2 – cited in Sen's paper at Cornell – find page number in Smith) recognized in his example of a linen shirt:

> A linen shirt, for example is, strictly speaking, not a necessary of life. The Greeks and Romans lived, I suppose, very comfortably though they had no linen. But in the present times, through the greater part of Europe, a creditable day-labourer would be ashamed to appear in public without a linen shirt, the want of which would be supposed to denote that disgraceful degree of poverty which, it is presumed, nobody can well fall into without extreme bad conduct.

Income, then, is important because it determines how fully one can participate in one's community (Sen ****). To apply the argument to income and happiness we assume that

people who participate more fully in community life tend to be happier than those who do not. The line of argument here is similar to the line of argument for the comparison principle since both emphasize the importance of community standards in determining the happiness of individuals. But the mechanisms differ. In the case of the comparison principle a bicycle brings happiness because of what bicycle ownership says about one's relative status. In the case of the social needs principle bicycle ownership brings happiness because it enables one to participate more fully in community life.[2] The consequences of changing peer-group or community income are the same either way: a decline in one's happiness if one's income fails to rise as fast as community income and a rise in one's happiness if one's own income rises faster than community income.

ARE ABSOLUTE INCOME EFFECTS ALSO IMPORTANT?

Critics of the relativistic view focus on the hedonic value of income, that is, on how income can be used to purchase items to satisfy material cravings *independent of community standards*. "People cannot be happy in chronic hunger, danger, and isolation," argues Ruut Veenhoven (1991, p. 32), "not even if they have never known better and if their neighbors are worse off." If income has hedonic value, we expect people on average to be happier in richer countries than in poorer countries. In general the cross-country evidence supports this view (Diener, Sandvik, Seidlitz and Diener 1992; Diener, Diener, and Diener 1995; Veenhoven 1991, 1995). Moreover, the income-happiness slope should be steeper among poorer countries where unmet needs are the greatest. The cross-country evidence here is generally supportive (e.g. Graham and Pettinato 2002, Figure 2-1; but see Diener, Sandvik, Seidlitz and Diener 1992, p. 216). What separates the relativist from the absolutist view, however, is the question of whether the slope has flattened out entirely for rich countries. Granted that income growth might buy a lot of happiness in poor countries, does it matter at all for average happiness in rich countries?

Aggregate trends for a number of rich countries suggest that the answer is no. There is a striking absence of change in average happiness in several countries that have experienced notable income gains in the post-World War II era, including Belgium, Japan, the United Kingdom, and the United States (Blanchflower and Oswald 2000; Diener and Oishi 2000; Easterlin 1996; Lane 1998 **CHECK these, other than Easterlin). Japan provides the most startling example. From the late 1950s to the late 1980s per capita income in Japan increased fivefold, car ownership increased from 1 percent of the population to 60 percent of the population, and the ownership of household consumer durables shot up rapidly as well (Yasuba 1991). Yet this sharp rise in prosperity was not accompanied by a rise in reported life satisfaction in Japan (Easterlin 1996, figure 10.3).

It is nonetheless premature to rule out absolute income effects in rich countries. In the first place, ordinary human behavior belies the tenets of the pure relativist position, as Veenhoven (1991, p. 2) notes:

[2] In some instances – such as the example of linen shirts in eighteenth century England – the two mechanisms go together: The lack of a linen shirt denotes a relative status (poverty due to bad conduct) that presumably hinders one's full participation in community life.

> [Relative income] theory holds that happiness does not depend on objective good, but rather on subjective comparisons..... Though held in great respect intellectually, this theory is seldom followed in practice. Personally, we all try to improve our situations in the hope of getting happier. Collectively, we require the (welfare) state to maximize material comfort, legal protection, and social security in the belief that such "social progress" will make life more satisfying. So there is something odd about the theory.[3]

Second, cross-country evidence does not uniformly support the relativistic view, since there are exceptions to the income-happiness trends just noted. Countries such as Denmark, Italy, Portugal, and South Korea have experienced increases in satisfaction along with rising incomes in recent decades (Hagerty and Veenhoven 2003). More important, trends over time at the national level very often do not mirror relationships at the individual level. Consider, for example, the well-documented finding that the rich, the highly-educated, and the elderly are more likely to vote in the United States. In recent decades U.S. society has become richer, more highly educated, and older, yet vote turnout in the United States has (until the 2004 Presidential election) fallen, not risen. The solution to this voting turnout puzzle is that voting participation is not determined completely by income, education, and age, and trends in the other determinants of voting have more than offset the effects of rising income, education, and age (Teixeira 1992). The same logic holds for income and happiness. For individuals, there could be an absolute income effect that produces rising happiness with rising income. That is the effect we want to find, if it is there. The effect might not appear in the national trend, however, since the effect of the income trend could be offset by the effects of other trends, such as rising income inequality (Hout 2003) or declining leisure time spent with family and friends (Lane 2000). Instead of relying on the aggregate trend for inferences about absolute income effects, it is better to separate out absolute income effects at the individual level – and for that, we need a new model.

METHODS AND MEASURES

Separating Income Effects with Individual-Level Data

The decomposition of income effects involves three steps. First we place people in their income reference groups. Second, we estimate the mean income : for those reference groups, that is, we estimate $:_j$ for the j = 1, 2, … J groups. Then we estimate the effect of those mean incomes on happiness, independent of the effect of individuals' incomes.

[3] Veenhoven's first example, that as individuals we "all try to improve our situations in the hope of getting happier," misses the mark, since the relative income hypothesis in fact implies that *individuals will benefit* from income gains (either by gaining on income relative to others, or by not falling behind as fast as otherwise). The more telling example is the collective one: "Collectively, we require the (welfare) state to maximize material comfort." Why should we strive for that, if income effects are entirely relative?

The general model is:

$$H_{ij} = \forall + (X_{ij} + * (X_{ij} - :_j) + ,_{ij} \qquad (1)$$

where H_{ij} is measured happiness for the i^{th} person in the j^{th} reference group, X_{ij} is measured income for the i^{th} person in the j^{th} reference group, $:_j$ is mean income for the j^{th} reference group, and , is a random error term. The parameter ((((> 0) captures the absolute effect of income and the parameter * (* > 0) captures income's relative effect.

It is helpful to think of absolute and relative income effects on happiness in terms of how your happiness is affected by the mean income of your group. First we rewrite equation 1 to isolate the relative income effect in the $:_j$ term:

$$H_{ij} = \forall + (X_{ij} + * (X_{ij} - :_j) + ,_{ij}$$

$$= \forall + (((+ *) X_{ij} - * :_j + ,_{ij} \qquad (1a)$$

Equation 1a states that, *for a given level of income*, people generally are happier in poor groups than in rich groups. In other words, your happiness is negatively affected by the income of your peers. That is a telltale characteristic of a relative income effect:

- *Relative effects:* Relative income effects imply that $:_j$ has a *negative* effect on happiness, controlling for X_{ij}.

We can also rewrite equation 1 to isolate the absolute income effect in the $:_j$ term:

$$H_{ij} = \forall + (X_{ij} + * (X_{ij} - :_j) + ((:_j - (:_j) + ,_{ij}$$

$$= \forall + (((+ *)(X_{ij} - :_j) + (:_j + ,_{ij} \qquad (1b)$$

Equation 1b states that, for two individuals with the same *relative* income, we expect greater happiness for the one who belongs to a richer group. This follows from the definition of an absolute income effect. For $X_{ij} - :_j$ constant, the individual who belongs to the richer group has the greater income. If the richer individual tends to be happier than the poorer one, the difference must be due to the absolute effect of income, since relative incomes are the same. So we have this telltale characteristic of an absolute income effect:

- *Absolute effects*: Absolute income effects imply that $:_j$ has a *positive* effect on happiness, controlling for $(X_{ij} - :_j)$, the difference between individual income and average income for the individual's reference group.

Data

We use 1972-2002 General Social Survey (GSS) data from the United States to test for relative and absolute income effects on happiness.[4] The use of U.S. data is strategic in light of claims that absolute income effects are restricted to poor nations where basic needs remain unmet for large numbers of citizens. "Once a certain standard of living is attained," Kenny (1999, p. 22) writes, "the relationship between [income] growth and happiness breaks down." Although no one knows the point at which income effects become entirely relative, among those who advance the relative income hypothesis there is general consensus that the United States and other rich Western nations have passed the threshold. In a sense, then, our analysis can be viewed as an attempt to determine if income in the United States has passed the point where income growth no longer affects the general happiness of citizens.[5]

We need just three variables to separate absolute and relative income effects: income (preferably family income), happiness, and a grouping variable that can be used to form the reference groups for calculating the $:_j$, the mean incomes. To increase the power of our analysis, it is also desirable to include a slice of history that spans several decades, and to include other determinants of happiness, such as marital status. The GSS meets all these conditions, albeit with a coarse measure of income.

We restrict our analysis to ages 20-64 since it is for this age group that questions concerning the effects of income are most relevant. For many respondents 65 years of age and older, income is less important than wealth; likewise, income is likely to be a less important consideration for students and beginning workers ages 18-19 than it is for those in the prime working-age population. In some survey years the question on general happiness was preceded by a similar question about the respondent's marriage, and Smith (1990) warns that the question order may have influenced responses to the general happiness question. We exclude the cases where this occurred.[6] We also exclude the 1982 and 1987 GSS oversamples of African-Americans.

In all there are 23,339 respondents ages 20-64 with data on family income and happiness who meet the above criteria. Of these, 16,665 have complete data on other key determinants of happiness (discussed subsequently). Our results are similar for both samples, as we see later.

Measurement

[4] The GSS is a probability sample of non-institutionalized English-speaking individuals, age 18 and older, in the United States. From 1972 to 1994 the GSS was an annual survey (with a few years missed); since 1994 the GSS has been conducted in even-numbered years. The sample sizes of each wave vary from about 1,500 for the annual surveys to 3,000 for the biennial surveys.

[5] As noted earlier, we cannot answer this question simply by examining the covariance of income and happiness over time, since income is not the only determinant of the trend in aggregate happiness.

[6] This includes all married respondents from the 1972 and the 1985 surveys, those who received form 3 of the questionnaire in 1980, those who received form 2 in 1986, and those who received either form 2 or form 3 in 1987. We find that our results are similar whether or not we exclude the problematic cases. To avoid redundancy, we report results only for the more restricted sample recommended by Smith.

Happiness. We measure happiness using the standard question employed since 1972 in the GSS: "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?" Schuessler (1988 **CHECK – cited in Hout, page 26) found this measure to be the best single indicator of morale in the nearly 900 items he examined. Note that the preliminary statement "Taken all together, how would you say things are these days" invites respondents to think of happiness in terms of a durable state rather than a temporary emotion or mood. People appear to have little difficulty answering the question; since 1972, over 99% of respondents have answered the question in the GSS.

We define happiness as the degree to which individuals judge the overall quality of their lives favorably. Consistent with prior studies, we use self-reported happiness. The rationale for using self-reports is that, for subjective states such as happiness, a respondent is in the best position to judge. Yet the use of self-reports raises the issue of comparability across respondents, since each respondent is free to set a different standard of happiness. Perhaps the rich report that they are happier because they have lower standards of happiness.

It would be useful then to find other evidence consistent with the self-reported greater happiness of those with more income. Easterlin (1996, chapter 10) suggests that we look to research findings on people's preeminent concerns. If we know what people are most concerned about, then we should have a good idea of what is needed to increase their subjective well-being. For most people everywhere – whether in rich countries or poor, in capitalist countries or socialist countries – personal economic well-being is the central concern, centered on "making a living and matters of family life" (Easterlin 1996, p. 132). These findings suggest that people do evaluate happiness on the basis of a fairly common set of criteria centered on economic and family concerns.

Aside from the issue of whether the income-happiness association could be a measurement artifact, a number of studies have addressed the more general issue of whether self-reported happiness is a valid indicator of one's true feelings. In an early survey article on subjective well-being Ed Diener (1984, p. 551) concluded that self-reported measures of well-being "seem to contain substantial amounts of valid variance."[7] Diener pointed to studies showing that those who report higher happiness scores tend to smile and laugh more during an interview, and they tend to be rated by others as happier. Diener's claim is supported by subsequent research as well. For example, Pavot (1991) and Watson and Clark (1991) -- **CHECK BOTH) confirm the association between self- and peer-rated happiness scores and Koivumaa et al. (2001) find in a longitudinal study that self-reported happy people are less likely to commit suicide decades later.

Income

We use respondent's family income instead of respondent's income. Not all respondents have income, and family income is a better indicator of one's status in the community

[7] Along the same lines, a study of self-reported physical health finds that "self-reported morbidity is equal or superior to physician-evaluated morbidity in a prognostic sense" (Ferraro and Farmer 1999, p. 303).

(for relative income effects) as well as a better indicator of one's likely living standard (for absolute income effects).

The GSS asks the same question in every wave of data collection: "In which of these groups did your total family income, from all sources, fall last year – before taxes, that is?" Because of inflation, the response categories that respondents could choose from have been altered five times since 1972 (in 1977, 1982, 1986, 1991, and 1998). In some instances the number of categories changed, as well as their values. For the years 1972-1976, for example, the lowest income category is "under $2,000" and the highest is "$30,000 or over." In contrast, for 1998-2002, there are more income categories spanning a broader range; the lowest category is "under $1,000" and the highest category is "$110,000 or over." Interested readers may consult our methods appendix for a description of how we converted categories to dollar values and adjusted the dollar values for inflation.

Relative Income

There are two ways to conceptualize *relative income*. We can think of relative income as remaining constant when all incomes are boosted by the same amount – for example, relative incomes remain constant when $100 is added to everyone's income. In other words, relative income remains constant when the income gaps are constant. This conceptualization of relative income, however, assumes that there is no diminishing utility to income – that a $100 raise has the same utility for the rich and the poor.[8] To permit diminishing utility, we can also think of relative incomes as remaining constant when everyone's income increases at the same rate. In this view, relative income is linked to the concept of income inequality, since income inequality also remains constant when incomes rise at the same rate for everyone (Allison 1978; Firebaugh 2003, chapter 4). In the case of logged income, $X_{ij} - :_j$ is constant when all incomes change at the same rate. Hence logged income can be used to measure relative income in the inequality sense. When income is not transformed, then of course $X_{ij} - :_j$ is constant when all incomes change by the same amount. In short, by using both metric income and logged income we can compare results for relative income conceptualized in terms of gaps versus relative income conceptualized in terms of inequality.

Reference Groups

It is important to note at the outset that it is not possible to estimate the strength of all social comparison effects combined, since there are any number of comparison groups that respondents might use. For example, respondents might use their friends or their local work units for comparison, and we cannot capture such local effects here. Even if such data were available, there is the vexing issue of how to aggregate local comparisons when comparison groups are not mutually exclusive. To avoid such problems, we focus on mutually-exclusive demographic characteristics that are not local but span society as a

[8] Graham and Pettinato (2002, figure 2-2) and Hout (2003, figure A-3) find a curvilinear relationship between income and happiness in the United States: the slope flattens out at higher levels of income, consistent with the diminishing utility principle.

whole. If we find substantively significant comparison effects based on general demographic characteristics, that in itself indicates the relevance of the comparison principle to the income-happiness relationship.

According to the original theory of social comparison in psychology, people compare themselves to similar others (Festinger 1954). We suggest that, in the case of income, age is a foremost consideration for determining "similar others." The importance of age in determining income reference groups is indicated by Easterlin's (2001) variant of the relative income hypothesis. Easterlin begins by asking why it is that the average happiness of a birth-cohort remains relatively constant as incomes rise over the life cycle when we know that richer people in fact tend to be happier. Easterlin's explanation is that aspirations grow along with income as cohorts move through the life cycle (see Easterlin 2001 for supporting evidence). If so, then individuals' income standards are dependent in the first place on age.[9]

For this study we define one's reference group as other respondents who are the same age (in years) and whose incomes were measured using the same income response categories. In other words, each age, ages 20-64, in the surveys 1972-1976, 1977-1981, 1982-1985, 1986-1990, 1991-1996, and 1998-2002 was defined as a reference group, resulting in 45x6 = 270 reference groups. On the basis of the GSS data, mean income was calculated for each of the 270 groups. There are other ways age-based reference groups could have been formed (for example, 5-year age groups), and we tried to strike the right balance between too many and too few reference groups for our sample size. We want enough reference groups to provide good estimates of the effects of the income means, but we cannot have too many groups because each group must have enough members to provide reliable estimates of the group's mean income.

Other Variables

Because it is the total income effect that we want to decompose, it would be a mistake to include other correlates of happiness in the decomposition itself (equation 1, above). It is nonetheless useful to examine other major correlates of happiness, for two reasons. First, the other correlates provide a yardstick for assessing the size of the income-happiness association. For that reason our first table below compares the size of the income-happiness association with the size of the association of happiness with education, with marital status, with health status, with work status, and with race. (We do not include gender because we found no difference in happiness between men and women.) Education is measured as years of schooling completed, from 0 (no formal schooling) to 20 (eight or more years of post-secondary schooling). The other variables are categorical (Table 1, below, provides the categories).

[9] In preliminary analysis (not shown) we also formed reference groups on the basis of education. In line with Easterlin's argument, income effects were much stronger and more robust in the case of age-based reference groups. Apparently age is more relevant than education in forming one's income standard. Because we want to provide a fair test of income effects, it is the age-based results that we report here.

Second, the other correlates of happiness provide a convenient specification test of our decomposition equation. If income brings happiness because of its hedonic value, the income effect should diminish or disappear when we control for happiness-inducing statuses or conditions – such as education, marital status, and health status – that are associated with income. By contrast, a relative income effect that is due to income comparison *per se* should be unaffected by the addition of these controls. Hence if we have properly specified the absolute and relative effects of income, the coefficient for the absolute income effect should approach zero when we add the controls, while the coefficient for the relative income effect should be largely unaffected.[10]

HYPOTHESIS

We have a single hypothesis:

Hypothesis. Income effects in the United States are both relative and absolute.

In other words, contrary to some theorizing about income and happiness in rich countries, we expect that money continues to have hedonic value even in a country as rich as the United States. Money continues to have comparison value as well, of course; so we expect to find both relative and absolute income effects.

We test our hypothesis by estimating equation 1 above. Evidence consistent with the hypothesis is provided by (> 0 and ∗ > 0, with (> 0 indicating an absolute income effect and ∗ > 0 indicating a relative income effect.

FINDINGS

Size of the Income-Happiness Association

We expect income to affect happiness in a consumerist society such as the United States. Income nonetheless is not the only – nor even the most important – determinant of happiness. Before addressing the issue of whether the income effect is absolute or relative or both, it is important to gain perspective on just how strongly happiness is associated with income in the United States by comparing the strength of the income-happiness association to the strength of the association of happiness with other key variables.

Table 1 reports correlates of happiness for respondents ages 20-64 in the GSS. To insure that differences in the associations are not due to sample differences, we use the same sample for each – the 16,665 respondents with complete data on happiness, family income, education, race, self-reported health status, marital status, and work status. To save space we report results only for percent "very happy;" our essential conclusions are the same when we dichotomize the other way by using percent "not too happy." The

[10] The relative income effect might be reduced somewhat if the effect is due to ability to participate in community life (an unhealthy person, for example, might be limited in that regard).

percentages for marital status and the other categorical variables are from cross-tabulation tables whereas the percentages for income and education are estimated using logit coefficients from generalized ordered logistic regression.

Table 1 About Here

The rich and the highly-educated tend to be happier than the poor and the less-educated. The association between income and happiness is substantially greater than the association between education and happiness, however (Table 1). Income differences also dwarf work status differences, since the differences in happiness among full- and part-time workers, students, retirees, and housekeepers are all fairly small. Laid-off workers are an exception – involuntary unemployment greatly reduces happiness – but the laid-off represent such a small fraction of the sample that their lower level of happiness has little impact on the overall association of work status and happiness.

Race, marital status and health status are also associated with happiness in the United States. With regard to race, about 32 percent of whites and 23 percent of nonwhites report that they are very happy. The race gap is less than half the size of the marriage gap, however, and the health gap is larger still. Indeed health appears to be the most important single predictor of happiness, with a striking difference of 18.3 percentage points (44.2 percent versus 25.9 percent) for those in "excellent" as opposed to "good" health – a difference that almost matches the difference in reported happiness between the married and unmarried, and is double the difference in reported happiness between whites and nonwhites.

These differences help us assess the magnitude of income's association with happiness. For example, if we compare those who are one standard deviation (roughly $37,000) above the mean on family income to those who are one standard deviation below the mean, we find a difference in happiness that is much greater than the race gap, somewhat smaller than the marriage gap, and substantially smaller than the gap between those with "excellent" versus "poor" health. Our conclusions are the same whether we use income or its logarithm.

Slopes for Absolute and Relative Income Effects

We turn now to the issue of whether the income-happiness association stems from absolute income effects or relative income effects or both. We used generalized ordered logistic regression to estimate our decomposition equation (see the methods appendix for a description of generalized ordered logit and our rationale for using it). Table 2 reports the results. Because there are three response categories for happiness, there are two sets of coefficients to report, one for "very happy" versus "pretty happy" or "not too happy," and one for "not too happy" versus "very happy" or "pretty happy." To distinguish the two comparisons, we refer to the second comparison as "unhappiness." If income has a positive effect on happiness, then it should increase the proportion very happy and reduce unhappiness, the proportion "not too happy". Thus we expect positive slopes in the first column in Table 2 and negative slopes in the second column.

Table 2 about here

The slopes are in fact positive for happiness and negative for unhappiness, for both relative income and absolute income. We find, then, clear evidence of *both* relative and absolute income effects on happiness in the United States. Relative income constant, individuals who are members of higher-income reference groups (and thus have higher incomes) tend to report greater levels of happiness than do members of lower-income groups – evidence of an absolute income effect. Moreover, for two individuals with the same income, the one who belongs to a poorer reference group will tend to be happier – a relative income effect. These findings hold for logged income as well as for metric income. In short, the results of Table 2 support our hypothesis.

We did not anticipate, however, that the relative income effect would dominate with regard to *unhappiness* ("not too happy"). The results reported here – and results for other samples not shown – indicate that unhappiness in the United States is affected by one's relative income while one's absolute income has little or no effect. Other studies are needed to determine if this pattern is restricted to rich nations. In the case of nations where abject poverty is widespread we would expect the opposite, that is, unhappiness should be affected by absolute income more than by relative income.

Magnitudes of Absolute and Relative Income Effects

We can think of income effects in terms of change over time as well as differences across individuals at a point in time. For example, a relative income effect means that, regardless of how rapidly our own income is increasing, we don't like it when our income gains lag behind the gains of those in our comparison group. To gauge the magnitude of the income effects reported in Table 2, we convert the logit coefficients into probabilities and calculate how much we expect those probabilities to change with a change in absolute or relative income. We use the language of change as a convenient way to describe the size of the income effects *implied* by the coefficients in Table 2 although, strictly speaking, the coefficients are based on differences across individuals (the GSS does not follow individuals over time).

In the case of absolute income effects we change the income mean while holding relative income (X_{ij} - :$_j$) constant. "Holding relative income constant" implies adding a constant to all incomes in the metric income model, and multiplying all incomes by a constant (that is, changing all incomes by the same percentage) in the logged income model.

Suppose all family incomes are boosted by $25,000, or by roughly 50 percent for the average family. Because all incomes are boosted the same amount, relative incomes remain the same in the metric income model, so any change in happiness must be due to the absolute, not relative, effect of income. Among average respondents (those with average incomes in average income peer groups) the coefficients in Table 2 imply that a $25,000 raise would increase the fraction in the "very happy" category by 3.0 percentage points, from 30.5 percent to 33.5 percent, and reduce the fraction in the "not too happy"

category by 1.8 percentage points (Table 3). By contrast, a $25,000 cut in family income would reduce the fraction of average respondents who are "very happy" by 2.9 percentage points and increase the fraction "not too happy" by 2.2 percentage points.

Table 3 About Here

Our estimates are somewhat smaller when we use the logged income results to assess the effect of raising all incomes by the same percentage, as opposed to the same amount. For average respondents a 50 percent across-the-board increase in family income is estimated to increase the fraction "very happy" only by 1.8 percentage points and to have no effect at all on the fraction "not too happy" since the relevant coefficient in Table 2 is not statistically significant. A 50 percent across-the-board cut in family income is estimated to reduce the fraction "very happy" by 2.9 percentage points yet not result in more unhappy people.

Given the apparent modesty of the effect of absolute income on happiness, we should not be surprised by the failure of previous studies to find increases in happiness commensurate with increases in family income over the long run in the United States. If the results for the United States are typical, they help explain why studies of other countries also find that trends in happiness tend to be much less steep than trends in national income. Absolute level of income apparently does affect happiness, but the effect is weaker than one might expect, and very likely is overshadowed in most instances by the effects of other determinants of happiness.

We use a similar method to gauge the size of relative income effects, except this time we estimate the effect of change in the income mean holding *income* constant. As before, we change the mean by adding a constant in the metric income model and by multiplying by a constant in the logged income model. The relative income effect is not large, but on the whole it is larger than the absolute income effect because relative income affects both "very happy" and "not too happy." Consider the effect for individuals whose relative income is reduced by a $25,000 jump in others' income. The coefficients for metric income in Table 2 imply that, for those whose relative income is reduced in that way, the proportion who are "very happy" falls by 1.9 percentage points while the proportion "not too happy" jumps by 3.6 percentage points. We see the same pattern when one's relative income is increased by a $25,000 reduction in others' income: Movement out of the "not too happy" category exceeds movement into the "very happy" category, even though "not too happy" is the smallest of the three categories. This pattern is in contrast to the pattern for absolute income, where the income effect lies mainly in the difference between "very happy" and "pretty happy" as opposed to the difference between "pretty happy" and "not too happy."

The bigger picture here, though, is that relative and absolute income effects both exist, and they both push in the same direction – to move people from lower to higher categories of happiness – so the two effects are reinforcing for individuals whose absolute and relative incomes are both increasing. Thus individuals whose family incomes rise faster than the family incomes of their age peers reap the benefits of both the

absolute and the relative effect of income. Suppose mean family income is constant in a peer group, with a $25,000 raise for some members and a $25,000 cut for an equal number. On the basis of our estimate of (+ ∗, for the first group we expect the fraction "very happy" to increase by 5.2 percentage points and the fraction "not very happy" to decline by 4.3 percentage points, while for the second group we expect the fraction "very happy" to decline by 4.7 percentage points and the fraction "not too happy" to increase by 6.2 percentage points.[11] In short, the combined effect of rising (or falling) relative and absolute incomes can be consequential for one's happiness, even though the absolute and relative effects of income by themselves are relatively modest. This reinforcing effect applies, however, only to individuals whose family incomes are rising or falling more rapidly than the incomes of their peers. The effect of income change will be small for many individuals because the absolute and relative effects of income change will often offset (as in the case, for example, where one's income grows more slowly than the average for one's peer group).

Our findings appear to be robust. That is important since, to our knowledge, no previous study attempts to decompose the income effect in precisely the way we do here. Because we could rely on no other studies for baseline estimates, we estimated our income model using various samples and methods to see if the findings would stand. We reran our income models using multinomial logit instead of ordered logit, for example, with similar results (not reported here). And we varied our sample by including the surveys that placed the marital happiness question just before the general happiness question. Again we obtained similar results.

Finally, we tested the specification of our income decomposition model by adding control variables. As noted earlier, if (in fact captures the hedonic value of income, then our estimates of (should go to zero when we control for the mechanisms through which money purchases happiness. Our estimates of the relative income effect ∗, by contrast, should be largely unaffected by our controls if ∗ is based on a comparison effect. Table 4 reports those results. Note first that (and ∗ are not greatly sensitive to the 29 percent reduction in the sample size, from 23,339 cases down to 16,665, resulting from missing cases in the control variables (compare "no controls, N=23,339" with "no controls, N=16,655"). The control variables, by contrast, matter (compare "no controls, N=16,665" and "with controls, N=16,665"). And they matter in the expected direction: When we add the controls our estimates of (reverse direction and generally are substantively and statistically non-significant, whereas there is no general tendency for our estimates of ∗ to move to zero. In other words, the absolute income effect disappears when we control for statuses that require money, or that are closely associated with money – as we would expect if income boosts happiness because of what it delivers materially. The coefficients for the relative income effect remain highly significant statistically after the control variables are added – as we would expect if income boosts happiness due to comparison effects. These results boost our confidence that, as

[11] We calculate this by summing (and ∗, weighting by the income change, and solving for the probabilities (not shown in Table 3, which calculates the absolute and relative effects separately, not combined).

advertised, (captures the hedonic effect of income while ∗ captures the comparison effect of income.

Table 4 About Here

DISCUSSION AND CONCLUSION

There are three important stories here. The first story is that relative income has an effect on happiness in the United States. The second story is that there is evidence of absolute income effects even in a country as rich as the United States. The third story is that the absolute effects are modest, so the aggregate happiness of U.S. residents is determined largely by factors other than income. We consider each of these stories in turn.

Relative Income Effects Exist

The issue of relative versus absolute income effects on happiness centers on the question of *how much* one's personal happiness is reduced by increases in the income of others. Even the most vocal critics of relative income theory, such as Veenhoven (1991, 1995), concede that the income of others matters some. "Happiness," Veenhoven writes (1991, p. 32), "depends … partly on comparison." Peer incomes could matter because we use the income of others to calibrate our own success (the comparison principle) and because others' income affects the level of income we need to participate fully in community life. If peers' income does not matter at all, then richer people are happier than poorer people solely because of the enjoyment of consumption *independent of* what others are consuming – a pure absolute income effect. At the other extreme, if peer incomes matter as much to us, dollar for dollar, as our own income does – for example, a $1000 raise fails to increase our happiness when our peers also receive raises of $1000 – then relative income is the entire story.

To determine how much our happiness is affected by the income of our peers, we must identify peer groups and sort people accordingly. The sorting variable is key to the separation of absolute and relative income effects. Ideally the sorting variable results in groups that are sufficiently large to permit reliable estimates of group means and sufficiently homogeneous that the groups in fact are used by individuals as income yardsticks. The problem is that large groups tend to be more heterogeneous, thus reducing the likelihood that individuals consistently use them as yardsticks for evaluating their own incomes. Our solution, which owes much to Easterlin's (2001) theory, is to use age as the sorting variable on the assumption that age serves as an important income reference in the United States. An individual in her twenties, for example, is much more likely to assess her own income status by comparing her family income to that of her 20-something friends than to the family incomes of those of a different generation. This solution does not capture all possible social comparison effects, but it does capture the effect of social comparison based on an important demographic trait that applies to all members of a society.

By using age we are able to construct 270 income reference groups over the years 1972-2002 in the United States. From these 270 income means, and income data for about 23,000 individuals, we find that peers' income does matter. Apparently individuals compare their own income to the income of others their age, and this comparison matters in how individuals report their happiness. Our findings are robust despite a coarse measure of income and an incomplete measure of comparison effects.

That peers' income plays a role in explaining income effects is welcome news for sociological theories that stress the importance of context, but it does not necessarily bode well for the future happiness of humans. If there is no absolute component in the overall income effect, then we are faced with the prospect of an hedonic treadmill, as we are doomed to the amassing of ever-greater material goods to "keep up with the Joneses," yet without any greater satisfaction since the Joneses are doing the same thing. We end up, then, with the sort of modern-day tragedy-of-the-commons situation described by Frank (1997): we would all be better off if we consumed less, but the individual-level incentives are all in the wrong direction in the consumption arms race. It is important, then, to determine if the income effect in the United States also contains an absolute component.

Absolute Income Effects Exist

The existence of absolute income effects has important implications for some bedrock assumptions in the social sciences. As Tibor Scitovsky (1976, pp. 133-4) points out, much work in economics takes as virtually self-evident that more income leads to greater happiness because "the higher one's income, the more one can spend, and the more one spends, the more satisfied one should be" (Davis, 1983, labels the income → happiness model "the economist's hypothesis"). Generally speaking, economists have a vested interest in countering the hypothesis that income effects are entirely relative (to support conventional economic concepts of utility) whereas sociologists have an interest in showing that income effects *are* relative (to support the central sociological notion of social comparison). It is ironic, then, that economists such as Richard Easterlin (1974, 2001) and Robert Frank (1999) are among the most prominent proponents of the relative income hypothesis, whereas a sociologist – Ruut Veenhoven – provides the most spirited critique of the hypothesis.

We find evidence of absolute income effects, but the effects in the logged income case are limited to the upper end of the happiness scale ("very happy"). Our findings provide ammunition for both sides of the debate over absolute income effects in rich countries. Proponents will point to our evidence that such effects exist. Skeptics will point to the modest effect of income growth on happiness: Our results suggest that even a 50% increase in income would purchase little additional happiness in the United States. (It is important to reiterate that these results do not necessarily apply to poor countries, where we expect income growth to buy a lot more happiness.) Of course, our estimates of income effects may be biased downward because of imperfect or incomplete measures of income, of happiness, and of income peer groups. Unless our estimates are wildly off the

mark, however, it is safe to conclude that even sharp income gains in the United States are unlikely to result in substantial gains in subjective well-being for the majority of U.S. residents.

Why Are Income Effects Not Larger?

Given that most individuals spend a substantial fraction of their adult lives working to earn income – some at jobs they dislike – one wonders why income does not have a greater effect on happiness. Neither the absolute nor the relative income effect is very large. Why do we work so hard to earn money if there is no guarantee that riches bring happiness?

The answer likely centers on an important principle in Harry Helson's (1964) adaptation-level theory – the habituation principle that we become adjusted to new circumstances, so the novelty of new circumstances wears off fairly quickly (Brickman and Campbell 1971). With respect to income, the habituation principle is supported by the finding that the perception of what constitutes "sufficient income" is closely associated with income itself (Rainwater 1994). As a result of habituation, individuals are not as happy with their income gains as they thought they would be before the gains. As Frey and Stutzer (2002, p. 412) put it, "Individuals anticipate substantial gains in terms of satisfaction from higher income, but in retrospect are often disappointed about the small size of the effects of the gains." Research on this issue finds that about two-thirds of the anticipated effect of an income gain is eliminated by the rising standard on "sufficient income" that accompanies the income gain (Frey and Stutzer 2002, p. 412).

Hence the effects of habituation appear to be quite significant in blunting the effect of income gains on happiness – and that blunting in turn no doubt is a principal reason why the income effect is not larger in the United States and elsewhere. That said, the habituation effect is incomplete since rich people do tend to be happier than poor people. In other words, if people adjusted quickly to changes in income, and habituation were the entire story, there would be no income effect at all. Yet income does have a positive effect on happiness, in the United States and elsewhere, and in the United States at least this income effect has both a relative and an absolute component.

METHODS APPENDIX

Converting Income Categories to Dollar Values

To convert the income categories in the GSS to dollar values, we follow standard research practice by assigning respondents the midpoint value of the category they selected. Respondents selecting the highest category are given an income 1.5 times the lower limit of that category (for example, $165,000 for a respondent who selected "110,000 and over"). Imputing income values from income categories is less than ideal, of course, and a likely result is that our income estimates will somewhat understate the true income effect. The greatest potential for measurement error occurs in the top income category, where there is no upper bound. This problem is diminished by our use of logged income as well as metric income.

If we could assume that income effects were entirely relative, and that relative income effects were based on income ratios (that is, inequality) instead of income differences, then we could ignore inflation. Because we cannot make that assumption, we adjust the income figures to year 2000 dollars using the Consumer Price Index (CPI) provided by the Bureau of Labor Statistics (http://www.bls.gov/cpi). Over- or under-adjustment for inflation should have little effect on estimates of the relative income effect, but it might affect estimates of the absolute income effect.

Estimation Method

Because our dependent variable is categorical, we selected an estimation method from the family of logistic regression models. In preliminary analysis we found that our results were essentially the same regardless of the model we used, but for theoretical reasons the generalized ordered logit model is the most appropriate here. The first choice is between multinomial logit and ordered logit. Ordered logit is better here because it makes use of the fact that the categories are ordered for the happiness variable. Ordered logit does not rely on the "independence from irrelevant alternatives" assumption of multinomial logit models (Long 1997, p. 182). The conventional ordered logit model estimates (1) the odds of reporting "very happy" or "pretty happy" versus "not too happy," and (2) the odds of reporting "very happy" versus "pretty happy" or "not too happy" on the assumption that the slopes are the same for (1) and (2). In other words, conventional ordered logit is appropriate if a change in income would have the same effect on the odds of answering "very happy" or "pretty happy" versus "not too happy" as it would for the odds of answering "very happy" versus "pretty happy" or "not too happy." We tested this assumption using a chi-square likelihood-ratio test (Long 1997). The test was statistically significant in every model we estimated, indicating that the constant slopes assumption is inappropriate. Hence we use the generalized ordered logit model, which allows slopes to differ across outcomes.

Table 1. Correlates of Happiness in the United States (N=16,665).

Variable	very happy
Income	
Income one std dev (Φ) above the mean	38.6%
Income one std dev (Φ) below the mean	23.4%
Difference:	15.2%
Income (logged) one Φ above the mean	39.1%
Income (logged) one Φ below the mean	23.1%
Difference:	16.0%
Education (years)	
Education one Φ above the mean	33.7%
Education one Φ below the mean	27.5%
Difference:	6.2%
Marital Status	
Married	40.0%
Not married	20.3%
Difference:	19.7%
Race	
White	31.9%
Nonwhite	23.1%
Difference:	8.8%
Self-Reported Health	
Excellent	44.2%
Good	25.9%
Fair	17.6%
Poor	15.9%
Difference, excellent - poor:	28.3%
Work Status	
Full-time worker	31.4%
Part-time worker	27.8%
Temporarily off work	29.1%
Retired	33.6%
Laid off (N=544, or 3.3% of sample)	16.9%
Student	29.6%
Keeping house	33.5%

Data: 1972-2002 General Social Survey respondents ages 20-64 with nonmissing data on happiness, income, education, race, self-reported health, marital status, and work status. Results are similar using pairwise deletion of missing data. Work status includes an eighth response category, "other," that has an unclear meaning and includes only 1.7% of the sample.

Table 2. Absolute and Relative Effects of Income on Happiness in the United States: Estimates Using Age-Based Reference Groups (N = 23,339).

	Very happy versus pretty happy or not too happy (logit)	Not too happy versus pretty happy or very happy (logit)
Income in 10,000s of dollars		
Absolute income effect (()	.056	- .075
	(.015)	(.022)
Relative income effect (∗)	.038	- .120
	(.016)	(.022)
Income logged		
Absolute income effect (()	.208	- .143
	(.056)	(.079)
Relative income effect (∗)	.191	- .451
	(.059)	(.082)

Notes: Standard errors are in parentheses. Coefficients are estimated using generalized ordered logistic regression in STATA.

Data: 1972-2002 GSS respondents ages 20-64 with nonmissing data on happiness and income, excluding GSS oversamples of African-Americans and GSS forms where the question on general happiness was preceded by a similar question about the respondent's marriage (see text).

Model: The general estimation model for relative and absolute income effects is $H_{ij} = \forall + (X_{ij} + * (X_{ij} - :_j) + ,_{ij}$.

Table 3. Absolute and Relative Income Effects Converted to Probabilities for the Average Respondent (N = 23,339).

	Change in probability	
	Very happy	Not too happy
Absolute income effect		
All incomes increase $25,000	+.030	- .018
All incomes decline $25,000	- .029	+.022
All incomes increase by 50%	+.018	not significant
All incomes decline by 50%	- .029	not significant
Relative income effect		
Ego's income constant, other incomes in ego's reference group:		
Decline $25,000	+.020	- .028
Increase $25,000	- .019	+.036
Decline by 50%	+.029	- .029
Increase by 50%	- .016	+.021

Notes: Results shown are for the average person in the average income group, calculated from the logit coefficients in Table 2. To illustrate: increasing all incomes by $25,000 adds .0556 x 2.5 = .139 to the log-odds of being very happy as opposed to pretty happy or not too happy. In other words, increasing all incomes by $25,000 multiplies the odds of being very happy by $e^{.139} = 1.149$. Multiplying the odds of being very happy by 1.149 increases the probability from .305 to .335 for the average person, an increase of .030. For percentage increases we use coefficients from the logged income model. Because log(1.5) = .4055, multiplying all incomes by 1.5 is equivalent to adding 0.4055 to the log(income). Hence a 50% across-the-board increase adds .2075 x .4055 = .084 to the log-odds of being very happy. For the average person, the probability of being very happy changes by .018, from .305 to .323.

Table 4. Absolute and Relative Effects of Income on Happiness in the United States, With and Without Controls for Marital Status, Health, Work Status, Race, and Education.

	Very happy versus pretty happy or not too happy (logit)	Not too happy versus pretty happy or very happy (logit)
Absolute Income Effect (α), Income in 10,000s of dollars		
No controls, N=23,339	.056 (.015)	- .075 (.022)
No controls, N=16,665	.067 (.018)	- .088 (.025)
With controls, N=16,665	- .017 (.019)	.024 (.026)
Absolute Income Effect (α), Logged Income		
No controls, N=23,339	.208 (.056)	- .143 (.079)
No controls, N=16,665	.253 (.066)	- .169 (.090)
With controls, N=16,665	- .145 (.071)	.192 (.095)
Relative Income Effect (β), Income in 10,000s of dollars		
No controls, N=23,339	.038 (.016)	- .120 (.022)
No controls, N=16,665	.033 (.018)	- .112 (.025)
With controls, N=16,665	.069 (.019)	- .101 (.026)
Relative Income Effect (β), Logged Income		
No controls, N=23,339	.191 (.059)	- .451 (.082)
No controls, N=16,665	.162 (.068)	- .439 (.094)
With controls, N=16,665	.324 (.072)	- .454 (.095)

Notes: Standard errors are in parentheses. Coefficients are estimated using generalized ordered logistic regression in STATA. Of the 23,339 respondents in our original sample, 16,665 have complete data on the control variables as well. We include both samples in the table to show that the absolute income effect disappears because of the control variables, not because of the change in the sample.

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