



Brief Report

Income and well-being: How big is the gap between the rich and the poor? ☆

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ABSTRACT

One of the most enduring debates in the literature on subjective well-being concerns the importance of money. Studies consistently show that the correlation between income and well-being is small. This evidence has been interpreted to mean that money does not matter and that people's intuitions about the causes of happiness are wrong. However, correlation coefficients are notoriously difficult to interpret, and thus it is possible that lay people's intuitions are correct, whereas psychologists' interpretation of correlation coefficients is wrong. Data from two large-scale studies replicate the relatively weak correlation between income and happiness. However, both studies show that these small correlations translate into large mean differences between rich and poor groups. These mean differences are medium in size even when the wealthy are compared to average. In addition, measurement error has negligible effects on the correlation coefficient, but has strong effects on the rich/poor happiness gap.

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1. Introduction

One of the most enduring debates in the literature on subjective well-being (SWB) concerns the association between happiness and income. Although intuition would suggest that money should play an important role, most psychologists and economists have concluded that lay people overestimate these effects and that money does not really matter that much.¹ Lucas and Dyrenforth (2006) recently reviewed the results from two meta-analyses, a narrative review of cross-national results, and many waves of a nationally representative survey. Their review showed that the average correlation between income and happiness tends to fall between .17 and .21. Although this correlation is robust, it would be described as small to medium in size by traditional standards, accounting for just 4% of the variance in SWB. This appears to support the counterintuitive finding that money does not buy happiness.

But is this association really that small? Does its size really run counter to the layperson's intuitions? Unfortunately, the consistent estimates that have emerged from the literature cannot answer these questions. No psychologist or economist has proposed a va-

lue for the correlation between income and happiness that he or she believes would match people's intuition. Instead, most who have discussed this effect have simply compared this estimate to the rules of thumb proposed by Cohen (1988). Because the correlations tend to fall closer to the guideline for "small" effects than the guideline for "large" effects, the correlation has often been dismissed as being unimportant. However, correlations are notoriously difficult to interpret (Rosenthal & Rubin, 1982), and thus, it is possible that it is not the layperson's intuition that is flawed, but psychologists' and economists' interpretation of this effect.² Small correlations may hide associations that would otherwise be described as large and practically important.

As an initial demonstration, consider the example of unemployment. The German Socio-Economic Panel Study (GSOEP) is a nationally representative household panel study that has been conducted for the past 24 years among residents of Germany (see Haisken-De New & Frick, 2005, for details). Each year, participants are asked about a variety of topics including their current employment status and their life satisfaction (rated on an 11-point scale). In one recent wave (conducted in 2006), 21,135 respondents provided answers to these two questions. Not surprisingly, there is an association between employment status and life satisfaction, but like income, the correlation is quite small. Specifically, the correlation between life satisfaction and a dichotomous variable indicating whether a person is registered as unemployed is just .19.³

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¹ It is important to note that most investigations of this effect are correlational, and therefore, the causal direction of this effect cannot be determined. We are careful to restrict our causal language to the theoretical processes that underlie this effect. When discussing the empirical results from this investigation, we will avoid the use of language that implies support for any particular causal direction.

² To be fair, at least one of us has also suggested that the correlation between income and happiness is small and relatively unimportant in a previous review (e.g., Diener, Suh, Lucas, & Smith, 1999).

³ For all inferential statistics reported in this manuscript, $p < .001$.

Furthermore, because correlations can easily be transformed to other effect sizes such as the standardized mean difference (d), one might assume that the mean difference between the unemployed group and the not-unemployed group is also quite small. However, this assumption would be incorrect. Because the precise formula for transforming a point-biserial correlation to a d depends on the proportion of participants in each of the two groups (Cohen, 1988), small correlations can translate into much larger d s (see McGrath & Meyer, 2006). In this case, the d comparing those who are unemployed to those who are not is $-.73$, an effect that would be considered medium to large by Cohen's (1988) traditional standards (Schimmack, Schupp, & Wagner, 2008). Thus, when base rates are low, small correlations can translate into large and practically important effects.

Although this discrepancy results from the fact that r effect sizes are base-rate sensitive whereas d effect sizes are not (McGrath & Meyer, 2006), similar interpretational difficulties could emerge when examining the association between two continuous variables like income and life satisfaction. The standard interpretation of this effect is that its small size means that the rich are not much more satisfied than the poor. Other accounts suggest that income may matter at low levels of income, but once some minimum is reached (with estimates often around \$50,000) additional increases do not matter. However, the differences between the rich and the poor or even the rich and the average might still be quite large if mean levels of life satisfaction for distinct income groups were examined. The goals of the current paper are twofold. First, using data from the GSOEP, we show that small correlations of the size that are typically found in the literature can translate into very large mean differences between distinct income groups. Second, using data from the most recent World Values Survey (WVS), we show how small differences in the size of these correlations can lead to large differences in the size of the rich/poor SWB gap.

2. Methods

2.1. GSOEP

The GSOEP is an on-going, nationally representative panel study of households in Germany. To make sure that results are not unique to any particular wave, each of the three most recent waves (2004, 2005, and 2006) was analyzed (N s = 20,867, 19,986, and 21,135, respectively).⁴ Life satisfaction was assessed using a 0–10 scale. Means and standard deviations for the 2004, 2005, and 2006 assessments were 6.80 (1.83), 6.95 (1.84), and 6.92 (1.80), respectively. These scores were standardized within year to facilitate interpretation. Thus, group means reflect differences from the average level of happiness presented in standard units. Yearly household pre-government income (i.e., income before taxes were subtracted and before government benefits were added) in Euros was used as the primary indicator of income. In addition, post-government income was also analyzed to determine whether the precise indicator of income that is used affects conclusions about its importance. Both variables were transformed to U.S. Dollars based on the exchange rates for January 15th of the corresponding year. Continuous income values were used in the correlational analyses. In addition, thirteen

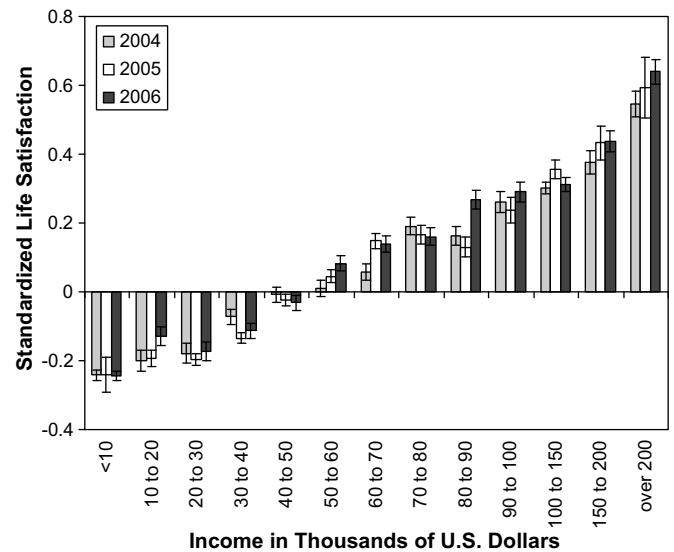


Fig. 1. Average standardized life satisfaction scores (with standard errors) for different income groups in the 2004, 2005, and 2006 waves of the German Socioeconomic Panel Study.

income groups (listed in Fig. 1) ranging from “below \$10,000 per year” to “\$200,000 and above” were created to assess average life satisfaction of people at various income levels.⁵

2.2. The world values survey

The World Values Survey is a study conducted using nationally representative samples from nations around the world. Sixty-seven nations were included in the 1999–2000 Wave, and only those nations are analyzed here. Between 720 and 4607 respondents were recruited within each country, with an average within-nation sample size of 1416. Participants were asked to report their life satisfaction using a single-item scale that ranged from 1 to 10 ($M = 6.42$, $sd = 2.56$). In addition, participants were asked to indicate their income, with responses coded into deciles for each nation. For instance, in the United States the top category was “\$100,001 and above,” a value that reflects the top 10% of incomes at the time of the survey.

3. Results

Consistent with previous research, the correlations between life satisfaction and pre-government income in the GSOEP were .17, .20, and .17 in 2004, 2005, and 2006, respectively. The standard interpretation of correlations this size would be that rich people are only slightly happier than poor people. However, Fig. 1 shows that this interpretation would be wrong. To facilitate interpretation of the small correlation, average standardized satisfaction scores were plotted for 13 income groups in each of the three years. Because these are standardized scores, the difference between any two groups can be interpreted as a standardized mean difference. As can be seen, the difference between the richest and poorest groups is large by traditional standards. Those individuals

⁴ It should be noted that the study organizers added an over-sample of households with high incomes in 2002. This over-sample (along with other features of the sampling strategy) could potentially influence the size of the income/life satisfaction correlation in undesirable ways. Therefore, we calculated the correlation between these variables using both unweighted responses and responses that had been weighted to maintain the representativeness of the sample. The correlations changed by less than .01 across the two methods. To maintain comparability with the group-based analyses reported below, all analyses use the unweighted responses.

⁵ Ideally, groups reflecting very small ranges of income would be created to provide a detailed picture of the differences in life satisfaction that emerge across many different groups. However, income cutoffs were chosen to provide reasonably precise estimates of the mean for each group. For instance, there are many respondents with incomes below the equivalent of \$100,000, so groups could be created for each \$10,000 increment. However, for incomes above \$100,000, fewer respondents were available, and larger groups needed to be constructed.

who make the equivalent of over \$200,000 a year report satisfaction scores that are .79, .83, and .88 standard deviations higher than those who make less than \$10,000 a year in 2004, 2005, and 2006, respectively. In addition, these differences do not end at the \$50,000 per year level. Instead, participants in the richest group report life satisfaction scores that are between one-half and two-thirds of standard deviation higher than the average participant (who has a household income equivalent to approximately \$55,000).

Pre-government income is a useful variable to investigate because it is a straightforward value that likely corresponds well to what people typically report when asked how much income they earn in a year—people may report their gross income without accounting for taxes or government benefits. Yet post-government income may be particularly important when examining the living conditions of those at the lowest income levels, as the benefits they receive from the government may make up a significant portion of their overall income. For instance, in the GSOEP, approximately 25% of respondents fell into the income category “Less than \$10,000” when government benefits were not included in the income value, whereas just 3% were included when government benefits were considered. Therefore, post-government income may provide a different picture of the well-being levels of those at different income levels.

Interestingly, the correlation between life satisfaction and post-government income was quite similar to the correlation between life satisfaction and pre-government income: .16, .19, and .17 in 2004, 2005, and 2006, respectively. However, the happiness of those in the lowest post-government income group was considerably lower than the happiness of those in the lowest pre-government income group: $-.46$ vs. $-.24$, $-.42$ vs. $-.24$, and $-.41$ vs. $-.24$ in 2004, 2005, and 2006, respectively. As a result, the difference between the richest and poorest groups increased to 1.04, 1.19, and 1.11 standard deviations in the three years we examined. Thus, when post-government income is examined, the difference between the rich and the poor is very large.

One final issue to consider is measurement error. Because life satisfaction was not measured with perfect reliability, effects will be attenuated by measurement error. Previous studies have estimated the reliability of the single-item life satisfaction measure at around .60 (Schimmack & Lucas, 2007), and this value can be used to correct both the r and the d for unreliability. Correcting the correlation coefficient has only a small effect: the life-satisfaction/post-government income correlations of .16, .19, and .17 increase to just .21, .25, and .22. However, unreliability has a large effect on the d : differences of 1.04, 1.19, and 1.11 between the rich and the poor increase to 1.34, 1.54, and 1.43 after correcting for attenuation. The differences between the rich and the average respondent increase to .74, .99, and .93 standard deviations.

These results are not an anomaly in the GSOEP data. The same pattern is replicated in the WVVS (though the fact that income was coded using deciles prevents us from examining participants with incomes as high as those in the highest group from the GSOEP). Furthermore, very small discrepancies in the size of the income/happiness correlation (discrepancies that might easily be dismissed as trivial) can lead to very large differences in the interpretation of these effects. To demonstrate, we used the following procedure.

First, within-nation correlations between income and life satisfaction were calculated separately for each of the 67 nations in the study. The nations were then ranked based on the size of this correlation. Correlations ranged from $-.04$ to $+.41$, with an average correlation of .21. Nations were then grouped into quartiles based on the size of this effect. The lowest quartile had an income/happiness correlation of .09, the second quartile had a correlation of .15, the third quartile had a correlation of .22, and the fourth quartile had a correlation of .32. Notably, these correlations are all within the range of correlations that have been found in the past, and all (with the possible exception of that for the highest quartile) would likely be described as small. Next, analyses similar to those conducted using the GSOEP were then conducted using multi-level modeling with individuals at level 1 and nations at level 2. The within-nation means for each decile were calculated separately for each of the four quartiles.

Table 1 reports average standardized life satisfaction scores for each income decile for the four sets of nations. Even in the group with the smallest average correlation, there is a small to medium-sized effect when comparing the top decile to the bottom decile. More importantly, these mean differences increase quite dramatically even as the correlation increases only slightly. The maximum difference increases to .56 standard deviations when the correlation is just .15, .82 standard deviations when the correlation is .22, and more than a full standard deviation (1.23) when the correlation is just .32. As in the GSOEP, the effect sizes are medium in size even if the rich groups are compared to the average respondent. Thus, weak correlations can translate into very large differences between the rich and the poor.

4. Discussion

The association between income and well-being has received considerable research attention because there are strong reasons to believe that the causal effect from income to well-being should be strong. Money can buy many of the things that people desire in life, including material goods, pleasurable experiences, better health, and increased safety and security. It would indeed be surprising if all of these benefits did not translate into greater life sat-

Table 1
Standardized life satisfaction scores for income deciles in the 2000 world values survey.

Income decile	Within-nation income/life satisfaction correlation quartiles			
	First ($r = .09$)	Second ($r = .15$)	Third ($r = .22$)	Fourth ($r = .32$)
1	-.26	-.25	-.37	-.54
2	-.13	-.26	-.28	-.48
3	-.05	-.13	-.19	-.27
4	.00	.03	-.04	-.06
5	.04	.05	.02	.08
6	.07	.14	.12	.26
7	.09	.24	.19	.40
8	.09	.24	.30	.52
9	.11	.20	.37	.63
10	.14	.31	.45	.69
Maximum difference	.40	.56	.82	1.23

isfaction. Yet research has consistently shown that the correlation between income and SWB is quite small. Many have interpreted this to mean that money does not matter for well-being, and that the rich are no happier than the poor. This surprising result could be due to adaptation processes that return individuals to baseline levels of happiness after a change in their material circumstances (see Clark, Frijters, & Shields, 2006, for a review). The results presented in this paper confirm that the correlation between income and life satisfaction is small to medium if evaluated using traditional guidelines for interpreting effect sizes. Yet, this small to medium effect can translate into very large differences between individuals with different levels of income. Thus, it may be that people's intuition about the effect was right all along, and it is psychologists' interpretation of the data that was flawed.

One might argue that the results presented in this paper exaggerate the effect of income because they reflect mean differences for people who report extremely high or extremely low levels of income. The differences among these groups would appear to be somewhat smaller if we had followed the normative procedure of plotting happiness values for individuals who were only one standard deviation above or below the mean. However, methodologists only recommend plotting these two values when no meaningful alternative exist (as is usually the case with the Likert-scale measures that psychologists often use). But in the case of income, specific values do have meaning. If psychologists want to know whether the rich are happier than the poor, then income values representing "rich" and "poor" should be plotted and interpreted. People might believe that becoming a millionaire would make a big difference in their lives. The data presented here are not inconsistent with this intuition.

We say the data are "not inconsistent" with this intuition because the correlations reported here cannot, of course, resolve questions about causality. There is at least some evidence that happy people make more money than unhappy people (e.g., Diener, Nickerson, Lucas, & Sandvik, 2002), and thus, people's intuition that high incomes cause high levels of happiness may be wrong, even if the association is quite large. However, researchers who believe that the effect is small in the first place will not go on to investigate the processes that underlie this effect. Therefore, even if questions about causality cannot yet be resolved, the current study shows that these questions are worth investigating.

It is important to note that even in a sample as large as the one that was recruited for the GSOEP, few extremely rich individuals were assessed. The wealthiest group we could examine using a relatively large sample size included those who make over the equivalent of \$200,000 per year. Thus, we do not know from this study—or from even the largest representative studies that have been used to examine the income-well-being association—how happy the extremely rich are. However, our results are consistent with previous studies that have attempted to answer this question. For instance, Diener, Horwitz, and Emmons (1985) published a study examining the well-being of the *Forbes* list of the wealthiest Americans. We calculated *d*-metric effect sizes for the five measures that were administered. The average effect size across the three global measures that are most similar to those included in this study (percent

of time happy, delighted-terrible scale, and life satisfaction) was .77. Although concerns can be raised about the sampling both of the wealthy Americans and the controls, Diener et al.'s study supports the idea that the extremely rich are quite a bit happier than the average person.

For the past few decades, research and theory in subjective well-being has been dominated by the counterintuitive finding that life circumstances play only a small role (see Diener et al., 1999, for a review). However, as old findings are reexamined, some of the more surprising conclusions must be revised (e.g., Diener, Lucas, & Scollon, 2006). For instance, although psychologists have interpreted the famous study by Brickman, Coates, and Janoff-Bulman (1978) as evidence that people adapt to disabling spinal-cord injuries, the differences between the injured participants and the controls in that study were actually large ($d = .78$). Furthermore, most studies that have examined the effects of such injuries are consistent with this conclusion (see Lucas, 2007, for a review). The current study adds to this growing body of evidence by showing that the differences between the rich and the poor are not as small as psychologists have suggested. Although the correlation between income and happiness is small to medium in size, this correlation has the potential to be misinterpreted. The analyses presented here show that the wealthy are considerably happier than the poor or even those with average incomes.

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