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# The Role of Spousal Income in the Wife's Happiness

Kitae Sohn<sup>1</sup>

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**Abstract** Few studies have examined spousal income in the context of happiness. This paper analyzes the Indonesia family life survey and finds a positive relationship between the husband's income and his wife's happiness. Specifically, a 100 % increase in the husband's income is related to a 0.72 % point increase in his wife expressing very happy, which is about 11 % of the proportion expressing that response. Surprisingly, among the husband's characteristics, only his income (along with health) is statistically significantly related to his wife's happiness. This positive relationship is particularly strong among old, educated, and poor (in absolute and relative terms) urban residents.

**Keywords** Happiness · Spousal income · Indonesia family life survey · Marriage

## 1 Introduction

For most people, happiness is the ultimate goal in life, and income is a means to achieving it. However, the subjective nature of happiness has long discouraged economists from investigating the role of income in happiness. Easterlin's (1974) seminal study changed this trend. Since then, a growing number of economists has examined the relationship between income and happiness. In his initial study, Easterlin (1974) puzzled over the fact that in developed countries, happiness levels remained the same even with increasing incomes, which was later referred to as the Easterlin paradox. This finding is considered a paradox because in economics, utility (or happiness) is conventionally believed to increase

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with income levels.<sup>1</sup> The implication of this paradox is substantial for the social sciences in general and economics in particular, because it implies the futility of economic growth beyond a certain level of economic development for achieving the ultimate goal in life, namely, happiness. Because of its significant implications, economists have tried to solve this paradox.

Initially, the insignificant effect of income on happiness led to an interest in examining the role of relative, rather than absolute, income in determining happiness (Easterlin 2001, for a summary). In general, (own) absolute income is positively related to happiness. Moreover, relative income—relative to some reference group—is positively related to happiness; that is, a person surrounded by people richer than him feels less happy even if he can be considered rich in absolute terms. This positive relationship between relative income and happiness suggests that, *ceteris paribus*, making everyone richer makes no one happier. This finding is consistent with the notion that happiness is relative; this argument is used to explain why people in even poor countries can be happier on average than those in rich countries.

However, some studies have argued that relative income did not always have a positive relationship with happiness. For example, using Russian data, Senik (2004) demonstrated that relative income exerted negative effects on happiness. This phenomenon, dubbed the tunnel effect by Hirschman (1973), explains that when people see their peers becoming rich, they too cherish the expectation of becoming rich in the future; consequently, this optimism generates happiness. Ravallion and Lokshin (2000) used the same data and reached similar conclusions.

In addition to absolute versus relative income, the discussion on income has incorporated time frame to explain the paradox. Evidence shows that past income is negatively related to current happiness (e.g., Di Tella et al. 2010; D'ambrosio and Frick 2012), but an expectation of high income in the future is positively related to current happiness (e.g., McBride 2001; De Neve and Oswald 2012). While the former is referred to as adaptation, the latter is called anticipation. Using an innovative combination of past, current, future, and relative incomes, Vendrik (2013) offered a more comprehensive explanation of the paradox.

To make matters more complicated, some economists have denied the existence of any such paradox. For example, Frijters et al. (2004) argued that positive income shocks after reunification exerted large effects on East Germans' happiness, indicating no satiation point of income for happiness. Deaton (2008) and Stevenson and Wolfers (2008, 2013) verified this argument using more datasets.

As can be seen, the Easterlin paradox has generated significant interest in the role of income in happiness, and in this context, both absolute income (with time frames) and relative income have been extensively discussed. However, little attention has been paid to spousal income and its impact on happiness. Spousal income has a peculiar status among income categories in that it does not fit neatly into either the absolute or the relative income category. On the one hand, sharing of spousal income reflects the norm that the husband is a breadwinner and the wife is a homemaker. In this light, spousal income could be considered own income for the wife. On the other hand, assortative sorting in the marriage market suggests that one's spouse may be a prominent reference individual; thus, one

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<sup>1</sup> Utility is an economic concept, while happiness is a psychological concept. However, in economics, it is typically hypothesized that happiness scores provide information about utility, so these two terms are often interchangeably used. We follow this convention.

compares his or her income with the spouse's income. Spousal income as relative income can be observed in the gender identity norm that a man should earn more than his wife.

In the literature on happiness, only a few studies have discussed the relationship between spousal characteristics and happiness. Groot and van den Brink (2002) examined how age and education differences in marriages were related to happiness. Powdthavee (2009) argued that one's happiness was positively related to the spouse's happiness. García et al. (2010) found that the husband's education was positively related to his wife's income satisfaction. Guven et al. (2012) conducted an investigation from a slightly different perspective by considering happiness as an independent variable and argued that happiness gaps between spouses were a good predictor of future divorce. Note that none of these studies has paid attention to spousal income. Even the authoritative work by Diener et al. (2010) in the happiness literature lacks an analysis of spousal income.

Spousal income is also relevant to sociobiology, in which it is widely understood that women are attracted to men with resources, while men are attracted to women with fecundity (e.g., Symons 1979; Buss 1994). Resources are usually measured in terms of income in modern economies, and fecundity is highly correlated with youth, health, and beauty. Although this simple argument is generally accepted in sociobiology, to the best of our knowledge no study in the discipline has investigated this argument using the concept of happiness.

Further, happiness has been extensively studied, but Indonesia has usually been neglected in the literature. This neglect is unfortunate because Indonesia is the fourth most populous country in the world. Analyzing the Indonesia Family Life Survey (IFLS), Sohn (2013a) investigated a large set of correlates of happiness in an omnibus style. Subsequently, Sohn (2013b) employed the same data and examined the role of (own) education on happiness. Recently, Sohn (forthcoming a) uncovered the mechanisms through which height increased happiness. However, he did not consider spousal income for happiness.

Thus, this paper contributes to the literature in at least four ways. First, spousal income takes center stage, contributing to the economics literature; second, it highlights an important feature of a spouse (i.e., spousal income); third, it considers happiness within the well-established sociobiological argument; fourth, it sheds substantial light on happiness in Indonesia, contributing to country studies. According to the sociobiological argument, women are more sensitive to male incomes than the other way around. As a result, women are the focal gender in this paper.

This paper finds that the husband's income is positively related to his wife's happiness by a non-negligible degree. A conservative estimation indicates that a 100 % increase in the husband's income is related to a 0.72 % point increase in the wife expressing very happy, which is about 11 % of the proportion expressing that response. This finding applies to a variety of subgroups to some extent, but it is the strongest among old, educated, and poor (in absolute and relative terms) urban residents.

## 2 Data and Methods

The main dataset for this paper is the IFLS. This ongoing longitudinal survey started collecting data on more than 22,000 individuals in 7224 households in 1993. Subsequently, four follow-ups were performed in 1997 (IFLS2), 1998 (IFLS2 +), 2000 (IFLS3), and 2007 (IFLS4). Although the survey is a longitudinal survey, this paper relies on IFLS4 because only this follow-up contains the variable of happiness.

Because the focal group is married women, we first extract household heads and their spouses from household rosters and then link men's characteristics to their wives. On removing women with missing values and restricting ages to 20–65, the final sample size is 6302. It is worth noting that people across the world are in general happy. As (Sohn 2013a, b forthcoming a) showed using the same data, the Indonesian population is not an exception. In addition, married individuals are on average, happier than unmarried individuals, and women are happier than men. Because married women are the focal group of this paper, our sample contains individuals who are happier than the average population. Moreover, by construction, the happiness measure in IFLS4 has an upper bound (explained below). Thus, there is not much room for improvement in their happiness. As a result, the sample is extracted in a way that makes it difficult to find a statistically significant relationship between the husband's income and the wife's happiness. Thus, if the relationship is statistically significant, this only reinforces our position that the relationship exists, and its size can be regarded as a lower bound.

Happiness in IFLS4 is measured to be ordinal instead of cardinal. Hence, an ordered probit is the natural choice, and most happiness studies have employed the same method for analyzing cross-sectional data. However, we perform robustness checks using other methods. In particular, the following model provides a conceptual framework for estimations. Suppose that the wife's welfare is a function of the husband's income and other covariates:

$$U = U(H, X_h, X_w)$$

where  $H$  indicates the husband's income and  $X_h$  and  $X_w$  refer to vectors of the husband's and wife's characteristics, respectively. Specifically,  $X$ , whether for the husband or wife, contains age, age squared, years of schooling, number of words recalled, height, obesity (defined as  $BMI \geq 25$ ), self-reported health status, and perceived income ladder; number of children is also added.

With an ordered probit model with linearization, the specification becomes

$$y^* = \alpha_1 H + X_h \alpha_h + X_w \alpha_w + e, \text{ and } e|H, X_h, X_w \sim \text{Normal}(0, 1),$$

where  $y^*$  is the latent variable of happiness, the  $\alpha$  are vectors of coefficients to be estimated, and  $e$  indicates the error term. Happiness levels can be defined as follows:

$$\begin{aligned} y &= 1 \text{ if } y^* \leq \mu_1 \text{ for very unhappy or unhappy} \\ y &= 2 \text{ if } \mu_1 < y^* \leq \mu_2 \text{ for happy} \\ y &= 3 \text{ if } y^* > \mu_2 \text{ for very happy,} \end{aligned}$$

where  $\mu_1$  and  $\mu_2$  are unknown cutoff points, to be estimated by maximum likelihood, along with the  $\alpha$ . Cross-section person weights with attrition correction are applied for all estimations, and standard errors are clustered at the county level to account for potential correlation within counties.

The dependent variable of interest (i.e.,  $y^*$ ) is happiness. Happiness is measured by the answer to the following question: "Taken all things together how would you say things are these days—would you say you were very happy, pretty happy, or not too happy?" The question lists three levels of happiness (i.e., very happy, pretty happy, and not too happy), but the respondent was presented with four options: very unhappy, unhappy, happy, and very happy. This question is identical to that of the US General Social Survey and is nearly identical to that of the Euro-barometer Survey Series. Both surveys list three, instead of four, levels of happiness, and few respondents in IFLS4 chose the option "very unhappy."

Additionally, the IFLS4 question lists three responses in itself. For these reasons, very unhappy and unhappy are combined. However, the results are robust regardless of this combination (see Appendix 2).

Kahneman and Deaton (2010) and Deaton (2013) emphasized the distinction between evaluative and hedonic subjective wellbeing. While the former is more suitable for long-term wellbeing, the latter is more suitable for short-term wellbeing. The happiness question in IFLS4 evaluates neither purely evaluative nor hedonic subjective wellbeing: while "Taken all things together" invites the respondent to evaluate their lives, "happy" invites contamination by the respondent's current hedonic state. This needs to be kept in mind when interpreting the results.

The independent variable of interest (i.e.,  $H$ ) is the husband's income. Income in this paper refers to income earned during the past year. Responses on income were invited to the following questions: for paid employees, "Approximately what was your salary/wage during the last year (including the value of all benefits)?" and for the self-employed, "Approximately how much net profit did you gain last year, after taking out all your business expenses?" Income for the month prior to the interview is available, and on combining this with work hours during the month, it is possible to calculate hourly incomes. However, job insecurity, economic shocks, and seasonality greatly affect workers in Indonesia; thus, monthly and hourly time spans are too short a duration to capture permanent income effectively. Although income during the past year is not the same as permanent income, this variable is the closest to permanent income available in IFLS4. As is often the case, we take the natural logarithm of income, which reflects the assumption that the wife's utility is a concave function of her husband's income. A dummy is created to indicate zero income<sup>2</sup>; most men without incomes are unpaid family workers or retirees. To save space, we explain variables in  $X_h$  and  $X_w$  in Appendix 1.

### 3 Results

Descriptive statistics are presented in Table 4 in Appendix 1. Because the values are similar to those typically found in developing countries, we do not dwell on detailed explanations of these statistics. It is, however, worth pointing out that women are generally happy: 87.0 % of them said happy. This large proportion of happy women is consistent with the argument of Diener and Diener (1996) that most people are happy across the world. Below, a mean marginal effect is estimated for a percentage point change in saying very happy with a unit increase in an independent variable. However, only 6.8 % of women said very happy. As a result, marginal effects are likely to be small, so it would be informative to compare marginal effects relative to the 6.8 %. For example, if a marginal effect is 3.0 % points, a one unit increase in the (continuous) variable raises the likelihood of saying very happy by 3.0 % points, and the size of the relationship is 44 ( $= 3.0/6.8$ ) % relative to the percentage of those saying very happy.

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<sup>2</sup> For the small number of the self-employed with negative profits, zero is assigned to the natural log of their incomes.

### 3.1 Main Results

Table 1 consists of two panels. The upper and lower panels display characteristics of husbands and wives, respectively. In Column 1, the natural log of income and the dummy for no income are entered into the specification. This unconditional result has two purposes. First, it indicates the total size of the relationship between the husband's income and his wife's happiness. Second, as more sets of covariates are entered, it demonstrates the extent to which the relationship is attributed to each set of covariates. Unconditional on other covariates, a 100 % increase in the husband's income raises the likelihood of his wife saying very happy by 1.9 % points, and relative to the percentage of those saying very happy, the size of the relationship is high at 27 %.

When the wife's basic demographics are added (Column 2),  $\alpha_1$  becomes smaller but remains statistically significant.<sup>3</sup> Reduction in  $\alpha_1$  implies that more educated women married men with higher incomes, and part of  $\alpha_1$  results from the wife's education. And the wife's demographics display relationships with happiness typically found in the literature: age has a U-shaped relationship with the trough at 52, whereas the number of schooling years has a linear relationship.

As more of the wife's covariates are added as in Column 3,  $\alpha_1$  further diminishes, but it is still statistically significant. At the same time, the additional covariates show intuitively "correct" signs. A wife with more cognitive capacity is happier, and it is also the case for a healthy wife. In addition, a wife who perceives herself as wealthier feels monotonically happier. For example, in terms of happiness, a wife who perceives herself as just above the poorest (at perceived income ladder 2) does not differ from those at perceived income ladder 1, but a wife at perceived income ladder 5 is 6.7 % points happier than those at perceived income ladder 1. Relative to the percentage of those saying very happy, the size of this relationship is very large: almost 100 %. Note that this large size is estimated after accounting for the husband's income. Although the husband's income does not capture the entire wealth of the household, it is a good proxy for wealth. Thus, these results suggest that just the perception of wealth, even at the same level of spousal income, exercises a major role in determining happiness. The importance of such perception can be understood when comparing its size with the husband's income. According to  $\alpha_1$  in Column 3, as much as an 800 % increase in the husband's income is needed to achieve a relationship of the same size as perceived income ladder 5. The large size of this latter relationship reflects the importance of relative income, which is at the center of the discussion on the Easterlin paradox.

Statistically insignificant covariates also provide interesting results. Although self-reported health has a statistically significant relationship with happiness, objective health measures do not share such a relationship with happiness. Thus, height, a summary measure of pre-adulthood environmental factors, is little related to happiness. At first glance, this finding is inconsistent with the fact that the taller earn more in Indonesia (Sohn 2015), which would potentially make them happier than the shorter. In fact, Sohn (forthcoming a) demonstrated that height and happiness were positively related among Indonesians. However, once the channels through which height increased happiness (i.e., years of schooling and perceived income ladder) were controlled for, the relationship lost its statistical significance. Thus, our finding results from controlling for these two variables (see Sohn forthcoming b, for more about height differences within couples in Indonesia). It

<sup>3</sup> Strictly speaking,  $\alpha_1$  is the coefficient on spousal income, but we also treat it as its marginal effect to save another notation.

**Table 1** Marginal effects of the husband's income on his wife's happiness: pooled sample

	1	2	3	4	5
<i>Husband's characteristics</i>					
Ln income (/10)	0.185 (0.023)***	0.123 (0.027)***	0.084 (0.026)***	0.072 (0.025)***	0.062 (0.026)***
No income	0.596 (0.086)***	0.362 (0.119)***	0.204 (0.098)**	0.171 (0.090)	0.140 (0.085)
Age (/100)				0.182 (0.192)	0.164 (0.198)
Age squared (/10,000)				-0.238 (0.176)	-0.214 (0.181)
Years of schooling (/10)				-0.002 (0.011)	-0.002 (0.011)
# of words recalled (/10)				-0.004 (0.008)	-0.004 (0.008)
Height (m)				0.006 (0.046)	0.006 (0.047)
BMI $\geq 25$ (/100)				0.941 (0.652)	0.900 (0.642)
Somewhat healthy				0.010 (0.006)	0.010 (0.006)
Very healthy				0.040 (0.011)***	0.040 (0.011)***
Income ladder 2				-0.008 (0.012)	-0.009 (0.013)
Income ladder 3				0.003 (0.011)	0.002 (0.011)
Income ladder 4				-0.007 (0.013)	-0.009 (0.014)
Income ladder 5-6				0.016 (0.024)	0.011 (0.024)
<i>Wife's characteristics</i>					
Ln income (/10)					0.010 (0.030)***
No income					0.160 (0.053)***
Age (/100)		-0.507 (0.138)***	-0.478 (0.158)***	-0.632 (0.211)***	-0.597 (0.216)***
Age squared (/10,000)		0.490 (0.148)***	0.484 (0.171)***	0.716 (0.220)***	0.664 (0.224)***
Years of schooling (/10)		0.040 (0.008)***	0.020 (0.008)**	0.019 (0.011)	0.016 (0.011)
# of words recalled (/10)			0.014 (0.007)	0.016 (0.007)**	0.015 (0.007)***
Height (m)			0.089 (0.049)	0.080 (0.049)	0.080 (0.049)
BMI $\geq 25$ (/100)			0.192 (0.432)	0.127 (0.451)	-0.152 (0.459)
Somewhat healthy			0.030 (0.005)***	0.029 (0.005)***	0.029 (0.005)***
Very healthy			0.059 (0.014)***	0.054 (0.014)***	0.054 (0.014)***

**Table 1** continued

	1	2	3	4	5
Perceived income ladder 2			0.010 (0.008)	0.009 (0.009)	0.008 (0.009)
Perceived income ladder 3			0.040 (0.008)***	0.038 (0.009)***	0.038 (0.009)***
Perceived income ladder 4			0.063 (0.007)***	0.062 (0.008)***	0.060 (0.008)***
Perceived income ladder 5			0.067 (0.027)**	0.058 (0.028)**	0.056 (0.028)**
# of children (/10)			-0.041 (0.022)	-0.038 (0.022)	-0.040 (0.022)
N	6302	6302	6302	6302	6302

Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

\*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

is also interesting to note that obesity is not statistically significantly related to happiness. This results from two contrasting effects. On the one hand, obesity is a health threat, so presumably it makes one less happy. On the other hand, rich people tend to be obese in developing countries, including Indonesia (Sohn 2014a, b). They can afford to be fat, whereas the less fortunate cannot, even if they want to. Hence, one can anticipate a positive relationship between obesity and happiness Sohn (2014c). Therefore, it is not surprising to find a negligible relationship between obesity and happiness.

Although not shown, we also experimented with other objective health measures such as BMI, BMI squared, lung capacity, hemoglobin level, blood pressure, hypertension derived from blood pressure, and grip strength (as a proxy for muscular strength). None of these objective measures, however, had a statistically significant relationship with happiness. Sohn (2013a) also reported the same result using IFLS4, and this result is similar to Deaton's (2008) finding in cross-country regressions that objective health measures (infant mortality, child mortality, and life expectancy) were not statistically significantly related to life satisfaction. The relationship between the number of children and happiness is negative but statistically insignificant. This finding is partly consistent with Hansen's (2012) conclusion in his review that parenthood showed small but statistically significant negative effects on happiness. He explained this conclusion, arguing that people believe that children will bring happiness, but they often ignore disadvantages of parenthood and advantages of childlessness. Overall, the results in Columns 2 and 3 suggest that Indonesian women do not differ too much from other populations and the following results may be generalized across other populations.

In Column 4, the husband's characteristics corresponding to his wife's ones are further added to the specification. Surprisingly, none of the husband's additional characteristics (save self-reported health) is statistically significantly related to the wife's happiness;  $\alpha_1$  becomes smaller but remains statistically significant. It suggests that a 100 % increase in the husband's income is related to a 0.72 % point increase in his wife expressing very happy, which is about 11 % of the proportion expressing that response. The husband's self-reported health has a large relationship with the wife's happiness: a very healthy husband increases the likelihood of his wife saying very happy by 4 % points, or about 60 % of the percentage saying very happy. Thus, it can be said that only the husband's income and health make his wife happy. Several interpretations are possible for the statistically significant marginal effect of the dummy for very healthy. For example, the husband's health may indicate additional power (not captured by his income) in providing resources for his wife and children. It could indicate power for providing resources other than material ones: sex is one example, and another is helping with household chores that require physical strength. Alternatively, it could be that a wife with a healthy husband may be free of caregiving for sick family members because she does not need to provide care for her husband, and he can help her care for other relatives. Regardless of the several interpretations, the two statistically significant variables (i.e., income and health) are consistent with the argument in sociobiological literature that women value men's characteristics for resourcefulness.

Thus far, the wife's income has been intentionally put aside because while male participation in the labor force is almost given, female participation in the labor force remains a matter of choice to a large extent; Sohn (forthcoming c) provided details on this topic for Indonesia women. More important, this choice is directly related to the husband's income for a married woman. For example, the wife may enter the labor force if a husband does not earn enough. Because of the involuntary nature of this decision, she may be unhappy. This involuntary nature of entering the labor force is plausible in the setting of a

developing country, because jobs particularly for women in developing countries require low skills and consequently are monotonous. Alternatively, if she earns more than he does, threatening the gender identity norm that a husband should earn more than his wife, she may decrease her working time and increase housekeeping time. Even if her income is not realized, she may anticipate that her income would exceed his and refrain from entering the labor market in the first place. In fact, Bertrand, Pan, and Kamenica (2013) provided evidence for such dynamics. The involuntary nature of these decisions may make her unhappy.

For these reasons, controlling for the wife's income could underestimate the portion of her happiness that the husband's income provides. For robustness checks, however, the wife's income and the dummy for no income are entered into the specification (Column 5). The wife's income is positively related to her happiness, and a wife without income is also happier than otherwise. Because 74 % of wives without income reported housekeeping (only 0.4 % of them were sick or disabled) as their primary activity during the week prior to the interview, no income may indicate a high socioeconomic status. This finding is also consistent with the involuntary nature of entering the labor force for women in developing countries. Moreover, controlling for these two additional variables little affects the marginal effects of other variables. In particular,  $\alpha_1$  diminishes but remains statistically significant. Furthermore, the marginal effect of the husband's income is more than six times as great as that of the wife's income; that is, the wife is happier if the same percentage of income comes from her husband than herself. This is not inconsistent with the argument that Indonesian wives involuntarily engage in paid work. The positive  $\alpha_1$  after accounting for the wife's income has further implications. It suggests that the husband's income is more likely to act as own income for the wife's happiness. If relative income effects dominated,  $\alpha_1$  would have been negative. Alternatively, the positive  $\alpha_1$  indicates the tunnel effect. Identifying which interpretation is correct is beyond the scope of this paper, but it is an interesting question for future research. Appendix 2 explains that these results are robust to other empirical methods and the main assumption for the empirical model is reasonable.

### 3.2 Results by Subgroups

Estimations with the pooled sample provide the general picture of the relationship between the husband's income and his wife's happiness. However, estimations by subgroups can help assess the extent and pervasiveness of this relationship across subgroups and identify subgroups that exhibit the strongest relationship. As before, all estimations in the following analysis control for the same as those in Column 4 of Table 1, but they are not listed for brevity. The wife's income and income status are not included in the specification because of the concern of possible underestimation of  $\alpha_1$ .

First, if the wife's marginal utility decreases with her husband's income, the strongest relationship is likely to be found among wives of low-earning husbands. In Table 2, this hypothesis is tested. Low- and high-earning husbands are distinguished based on the husband's standing in the sample; the cutoff points are 25, 50, and 75 percentiles. To be consistent with the literature and comparable with the results from the pooled sample, ordered probit models are employed, and marginal effects are presented. When the 25th percentile is the cutoff point,  $\alpha_1$  for the poor group is greater than that for the pooled sample, whereas  $\alpha_1$  for the rich group is smaller and not statistically significant. The size of  $\alpha_1$  changes as cutoff points change, but the largest  $\alpha_1$  is found for a wife whose husband earns less than the 25th percentile of all husbands' incomes. This finding is consistent with

**Table 2** Marginal effects of the husband's income on his wife's happiness: rich versus poor

	1 <25p	2 ≥25p	3 <50p	4 ≥50p	5 <75p	6 ≥75p
Ln income (/10)	0.129 (0.029)***	0.044 (0.041)	0.068 (0.038)	-0.020 (0.068)	0.088 (0.033)***	-0.052 (0.135)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
N	1329	4299	2809	2819	4219	1409

Covariates same as those in Column 4 of Table 1 are included but not listed. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

\*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

the conjecture that the wife of a low-earning husband is more responsive to her husband's income.

There are more interesting ways of grouping wives as in Table 3. One obvious category is age. A young wife may still be attracted to other attributes of her husband besides money. Alternatively, she may not need as much money as an old wife because she is healthy and her children are relatively young. In addition, she may have experienced less of rich people's standards of living than an old wife, so she has a lower reference income and a higher level of happiness. On the other hand, she may attach more importance to her husband's income because in general, the young are less wealthy than the old. Columns 1 and 2 show that  $\alpha_1$  is greater for old wives (i.e., aged 50 or more) than for young ones.  $\alpha_1$  for the young group is smaller than that for the old group, but is not statistically significant. This statistical insignificance is not due to a small sample size: the sample size of the young group (5090) is greater than that of the old group (1212).

Education is another category for grouping. A less educated wife (i.e., <10 years of schooling) may be more responsive to her husband's income than a more educated wife because she is more likely to marry a low-earning man. On the other hand, a more educated wife has higher aspirations and as a result, a higher reference income. According to Columns 3 and 4,  $\alpha_1$  for both groups is statistically significant, implying that the wife's happiness is influenced by the husband's income for both groups. However,  $\alpha_1$  for the more educated group is more than twice as great as that for the less educated group.

Residential location can mediate the relationship between the husband's income and the wife's happiness. In general, people in rural areas are poorer than those in urban areas. In this case, a wife's happiness in rural areas may be more influenced by her husband's income. On the other hand, rich people in urban areas are much richer than those in rural areas. In this case, people in urban areas have higher reference incomes, and a wife there may care more about her husband's income than her rural counterparts. This process is facilitated by high population densities in urban areas, where people can easily observe others' (particularly rich people's) standards of living. Columns 5 and 6 show that the happiness of both groups is statistically significantly related to the husbands' incomes, but  $\alpha_1$  for the urban group is two times as great as that for the rural group.

Much attention has been paid to relative income in the discussion on the Easterlin paradox, and the results in Tables 1, 2 and 3 also demonstrate the importance of relative income for happiness. There is another way of examining this. Within each perceived income ladder, there is a large variation of the husband's income. Alternatively, wives with the same amount of their husbands' incomes perceive themselves as being at different income ladders. Perceptions differ because they have different reference incomes. Then, it

**Table 3** Marginal effects of the husband's income on his wife's happiness: subsamples

1	2	3	4	5	6	7	8	9
Age <50	Age ≥50	School <10 years	School ≥10 years	Rural	Urban	Income ladder 2	Income ladder 3	Income ladder 4
Ln income (/10)	0.064 (0.033)	0.051 (0.026)**	0.134 (0.055)**	0.052 (0.024)**	0.100 (0.042)**	0.095 (0.040)**	0.072 (0.037)	-0.074 (0.070)
Covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5090	4368	1934	3012	3290	1471	3389	1078

Covariates same as those in Column 4 of Table 1 are included but not listed. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

\*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

**Table 4** Descriptive statistics

Continuous variable	Husband		Wife	
	Mean	SD	Mean	SD
Ln income <sup>a</sup>	15.62	1.23	15.10	1.44
Age	43.5	13.3	38.8	12.2
Years of schooling	8.0	4.5	7.3	4.5
# of words recalled	8.2	3.6	8.1	3.6
Height (cm)	161.6	6.3	150.9	5.5
Discrete variable	Percentage		Percentage	
Very unhappy/unhappy			6.2	
Happy			87.0	
Very happy			6.8	
Zero income	10.7		38.4	
Positive income	89.3		61.6	
BMI <25	79.2		63.7	
BMI ≥25	20.8		36.3	
Unhealthy/somewhat unhealthy	12.8		15.1	
Somewhat healthy	76.9		75.5	
Healthy	10.3		9.4	
Perceived income ladder 1	5.0		4.4	
Perceived income ladder 2	24.9		23.3	
Perceived income ladder 3	53.4		53.8	
Perceived income ladder 4	15.4		17.1	
Perceived income ladder 5–6	1.3		1.3	
N	6302			

<sup>a</sup> Means and SDs are calculated for only men and women with positive incomes

is of interest to understand whose happiness is affected more by the husband's income. If the relative income effects are important, a wife who perceives herself as poor relative to others will be much influenced by her husband's income, whereas the opposite is the case for a wife who perceives herself as relatively richer than others. Columns 7–9 check this possibility. Because sample sizes are small for income ladders 1 and 5, wives in these categories are not considered. As expected, the results are consistent with our conclusion on the importance of relative income. As a wife perceives herself as relatively poorer than others, her happiness is affected more by her husband's income. Specifically, a 100 % increase in the husband's income is associated with a 0.95 % point increase in saying very happy for a wife at ladder 2; the corresponding figure is 0.72 % points for a wife at ladder 3, but weakly significant (a  $p$  value of 0.055). In contrast,  $\alpha_1$  for a wife at ladder 4 has a "wrong" sign and is not statistically significant.

The results in Tables 2 and 3 indicate that the relationship between the husband's income and his wife's happiness is found for some subgroups. However, one can identify a particular group of wives whose happiness is most affected by their husbands' incomes. They are old, educated, and poor (in absolute and relative terms) urban wives. This finding makes sense in the context of relative income. With age, one becomes more aware of others' high standards of living, and more education raises aspirations. When these raised aspirations are not met by her husband's income, the wife tends to feel relatively poorer. In turn, relative poverty sensitizes a wife to her husband's income, and she experiences more

happiness from the same percentage rise in her husband's income than those who perceive themselves as relatively richer than others. Such comparisons are easier in urban areas, where people live close to one another.

## 4 Conclusions

Although substantial attention has been paid to the role of absolute and relative income in happiness, relatively little is known about the relationship between spousal income and happiness. Even when happiness is discussed in a much larger context, the majority of research concerns the relationship of own attributes and happiness; relatively little light has been thrown on the relationship between spousal characteristics and happiness. Furthermore, the common argument in sociobiology that women are attracted to men with resources has not been tested using the concept of happiness. Additionally, the happiness literature has neglected Indonesia, although it the fourth most populous country in the world.

Analyzing IFLS4, this paper estimates the relationship between the husband's income and his wife's happiness. The results show that the relationship is positive. A 100 % increase in the husband's income is related to a 0.72 % point increase in his wife saying very happy. This size is meaningful because it is about 11 % of the proportion expressing that response. On further analyses of the subgroups, old, educated, and poor (in absolute and relative terms) urban wives show the strongest relationship.

Our results suggest that spousal income acts like own income for women. The results also highlight that spousal income may play an important role in happiness. Although it is intuitively obvious, empirical research on happiness has not paid appropriate attention to this relationship. Furthermore, our results are consistent with the sociobiological argument that women are attracted to men with resources; women are not just attracted to such men, but also they are happier when they are married to such men.

Future research can focus on addressing limitations of this paper. An obvious limitation mainly results from the cross-sectional nature of the data. Had the IFLS allowed us to exploit the longitudinal scheme of the survey, it would have been possible to address time-invariant individual heterogeneity, introducing fixed effects or differencing out time-invariant individual heterogeneity. This limitation is inevitable in analyzing the IFLS because the question on happiness was asked only once. If the next follow-up contains the same question, it will be possible to check the validity of our results. Related to the cross-sectional nature of the data, our results are based on correlation rather than causation. Because it is equally possible that happy women marry high-earning men, it is difficult to contend that the positive  $\alpha_1$  indicates that the husband's income increases the wife's happiness. However, showing that both variables are positively correlated, our results at least suggest that future research may find causality running from the husband's income to the wife's happiness. In this endeavor, one may hypothesize a potential mechanism through which the husband's income causes his wife's happiness and use a structural equation model to test it. Furthermore, husbands' incomes may contain measurement error due to underreporting. If the error is random, then  $\alpha_1$  is underestimated owing to the usual attenuation bias, which makes rejection of the null hypothesis  $\alpha_1 = 0$  difficult. In this sense, the issue of measurement error in husbands' incomes only strengthens our position. However, if the error is not random,  $\alpha_1$  is biased. For example, suppose that the husband is engaged in illegal activities and does not report income stemming from such activities. Suppose further that his wife is unhappy because of his illegal activities. Then,  $\alpha_1$  is biased upwards. It is difficult to circumvent this concern because the IFLS contains only self-

reported incomes. Nevertheless, this paper sheds considerable light on the significance of spousal income in the happiness literature; future research with better data is expected to greatly aid in placing our findings on firmer ground.

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## Appendix 1: Descriptions of Covariates

The variable of years of schooling is constructed using two variables: the highest education level attended and the highest grade completed at that school. Only regular education is considered, so a small number of respondents are excluded from analysis whose highest education refers to adult education, Open University, or Islamic schools. Cognitive capacity is measured as follows. Interviewers read 10 words slowly to the respondents and then asked them to repeat the list twice: once immediately after the list was read and some minutes later for a second time. The sum of words correctly recalled in the two sessions serves as a measure of cognitive capacity.

Height is a summary measure of the pre-adulthood environment because given one's genetic factors, more nutrition and less disease make one taller. Height in IFLS4 is measured, instead of self-reported. Obesity is measured by body mass index. The World Health Organization (2000) suggested a body mass index (BMI) of 25 or greater to define obesity for adult Asians. This paper follows this suggestion to define obesity. The final measure of health is self-reported health status. Because few respondents said, "very unhealthy," we combine the categories of very unhealthy and somewhat unhealthy.

In addition, a perceived income ladder on a scale of one (the poorest) to six (the richest) is included. For this variable, respondents answered the following question: "Please imagine a six-step ladder where on the bottom (the first step), stand the poorest people, and on the highest step (the sixth step), stand the richest people. On which step are you today?" Because few respondents chose the sixth step, we combine the fifth and sixth steps.

A final covariate—number of children—is shared by the husband and his wife. This variable is considered because there is an extensive literature on the relationship between parenthood and happiness (Hansen 2012, for a review). In this paper, children are defined by their relationship with the household head in the household roster. In preliminary analyses, ages of children are adjusted to be under 3, 5, 7, and 15. Regardless of cut-off points, the variable is little related to happiness. Thus, we report the coefficient on number of children without age restrictions.

## Appendix 2: Cardinal Measures of Happiness

Some researchers (e.g., Ng 1997, 2008) favored cardinalism. In this case, OLS is a better choice. Furthermore, Ferrer-i-Carbonell and Frijters (2004) demonstrated specifically for longitudinal data that using a fixed effects model could change the results to some extent, but for cross-sectional data, using an ordered probit, ordered logit, or OLS did not alter the results. In this appendix, we show that cardinalism based on OLS produces the materially same results as those produced by ordinalism based on ordered probit models.

Cardinal measures of happiness are estimated in OLS with the same covariates as those in Column 4 of Table 1. In Column 1 of Table 5, the scale of happiness ranging from one

**Table 5** Cardinal Measures of Happiness

	1 Happiness 1–3	2 Happiness 1–4	3 Happiness –2–2
Ln income (/10)	0.152 (0.050)***	0.159 (0.051)***	0.226 (0.090)**
Covariates	Yes	Yes	Yes
N	6302	6302	6302

Covariates same as those in Column 4 of Table 1 are included but not listed. Cross-section person weights with attrition correction are applied for all estimations. Standard errors clustered at the county level are in parentheses

\*\*  $p < 0.05$ ; \*\*\*  $p < 0.01$

to three is placed on the left hand side of the specification. This scale is the same as that used in the ordered probit models. The result suggests that an additional percentage increase in the husband's income is related to a 0.016 increase in this happiness scale. Recall that very unhappy is combined with unhappy because few respondents opted very unhappy. In Column 2, these two categories are separated; now, one is assigned to very unhappy, two to unhappy, three to happy, and four to very happy. Nevertheless,  $\alpha_1$  is almost the same as that for the 1–3 scale. In addition, Ng (1997, 2008) preferred cardinal measures of happiness to ordinal measures, arguing that people care about *net* happiness (i.e., enjoyment minus suffering including spiritual and sensuous). Hence, he proposed that negative values be assigned to unhappiness and positive values to happiness. Following this proposition, minus two is assigned to very unhappy, minus one to unhappy, positive one to happy, and positive two to very happy. This scale of happiness is considered in Column 3, and the result also indicates a positive relationship between the husband's income and the wife's happiness. Thus, the results in the table demonstrate that this positive relationship is robust to cardinal transformations of an ordinal measure of happiness.

## Testing the Proportional Odds Assumption

One crucial assumption for an ordered probit is that  $\alpha_1$ ,  $\alpha_n$ , and  $\alpha_w$  are the same for each value of  $y$ , referred to as the proportional odds assumption. This assumption is testable. We perform this test with covariates identical to those in Column 4 of Table 1, i.e., with the full set of covariates. Specifically, we take this assumption, which is equivalent to a standard ordered probit, and then relax the assumption for the husband's income; the first model is nested in the second model. Then, we run a likelihood ratio test, and the result suggests that the assumption is not violated.

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