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DOES WEALTH ENHANCE LIFE SATISFACTION
FOR PEOPLE WHO ARE MATERIALLY DEPRIVED?
EXPLORING THE ASSOCIATION AMONG THE *ORANG
ASLI* OF PENINSULAR MALAYSIA

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ABSTRACT. Recent studies investigating need theory and the extent to which money can buy happiness have called for more research within culturally homogeneous samples from developing countries to explore this relationship. We examine wealth as a measure of possessions and savings and relate this to subjective well-being (SWB) among poor indigenous farmers in Peninsular Malaysia. With hierarchical multiple regression, we find that the association between wealth and life satisfaction, after controlling for demographic variables, is positive and significant, $\beta = 0.24$, $p < 0.001$. This effect is similar to effect sizes reported for other poor samples around the globe and is larger than what has been normally found in Western samples. Our analysis of the Malay translation of the Satisfaction with Life Scale (SWLS) reveals rather low internal reliability and prompts us to explore the potential wealth-SWB relationship in the absence of measurement error. We find a larger effect size when measurement error is removed, $r = 0.43$. We discuss the use of latent variable analysis to better interpret wealth-SWB effect sizes and recommend its use for future studies that use SWLS translations. Finally, we find that age, education, family size, and recent illness, while weak zero-order correlates of SWB, become significant predictors of life satisfaction when included with wealth in the multiple regression model. Some explanations and implications of these findings are conjectured. Our study contributes a unique sample to the expanding literature in support of need theory, and may be one of the first to examine the relationship between wealth and life satisfaction among a country's aboriginal people.

KEY WORDS: indigenous, poverty, satisfaction with life scale, subjective well-being, wealth

Imagine the life of an *Orang Asli* (literally “original man”). He lives in a village that was established as an aboriginal reserve by the government and the poorly-kept dirt road leading into his village has deep potholes. He built his stilted one-room hut with forest bamboo and his household's most valuable possessions include a radio, a gas

stove, and a motorcycle owned by his nephew. Households in his village have no electricity, no indoor bathrooms (few even have outhouses), and share a single water pump. He and most of the people he knows have less than a grade school education. He has no savings. How happy do you think he is? Now imagine another villager with the same life circumstances but possessing a few more basic amenities (electricity and an indoor bathroom), a couple of luxury items (a television and a VCD player), and some savings. Is he any happier?

Efforts to answer this question might lead one to consult the discipline of economics where much has been written on the subject of income and utility. Assuming that the terms happiness, subjective well-being (SWB), life satisfaction, and utility can be used interchangeably, one will find classical utility theory proposing an indirect causal link between income and happiness that is mediated by the consumption of goods and services.¹ In applied arenas, however, four decades of research on the wealth–happiness relationship suggest a rather weak association, especially in wealthy Western samples where material prosperity tends to be a salient ambition (Diener et al., 1999). Many economists and psychologists have responded to these consistent findings by formulating and testing theories to explain why money does not necessarily make people happier (Brinkerhoff et al., 1997; Clark and Oswald, 1994, 1996; Diener and Lucas, 2000; Easterlin, 2001; Schyns, 1998).² One such theory (need theory) has stimulated the growth of a new research area devoted to exploring wealth and SWB among the poor and non-elite, especially from developing and transitional countries.

PAST STUDIES OF WEALTH AND SWB: THE CURVILINEAR PHENOMENON AND NEED THEORY

Most studies of wealth and SWB in non-Western societies have reported statistically larger wealth-SWB correlations than their Western counterparts³ (Howell and Howell, 2005; Schyns, 2002). Several studies have detected the now familiar curvilinear pattern of correlations across wealth levels, with stronger positive relationships occurring among poorer samples and weaker relationships among wealthier ones (Diener and Biswas-Diener, 2002; Diener and Diener, 1995; Schyns,

2002; Veenhoven, 1991). This trend has, perhaps, been best described by need theory, which proposes that income is most strongly associated with SWB when it is used to help satisfy basic physiological needs such as regular nutritious meals, clean water, and safe shelter⁴ (Biswas-Diener and Diener, 2001; Diener and Lucas, 2000; Schyns, 1998). Although need theory is typically accepted as the explanation for the diminishing marginal utility of wealth across socioeconomic groups, past studies have called for more research to examine wealth and happiness at the lowest income levels (e.g. Biswas-Diener and Diener's 2001 Calcutta sample). However, since both wealth and SWB are correlated with a number of demographic variables,⁵ it has been suggested that future studies of the wealth-SWB relation control for these in order to disentangle any shared variance (Diener and Biswas-Diener, 2002).

OBJECTIVES OF THE CURRENT STUDY

The main objective of the present study is to explore the wealth-happiness correlation among a poor, rural, indigenous sample in Peninsular Malaysia. Normally, indigenous groups are subjects of more qualitative anthropologic or ethnographic research and are not represented in large sample surveys (Biswas-Diener and Diener, 2001). To our knowledge, this is the first study to compare wealth and SWB for an aboriginal group of any country, and certainly is the first of its kind in Malaysia. The goals of this project include (1) determining the factor structure of the Malay translation of the SWLS, (2) assessing the wealth-SWL relation while controlling for other household characteristics such as age, education, family size, and recent illness, and (3) exploring the use of latent variable analysis to correct for error in wealth and SWB measurements, which may attenuate the correlation in some samples.

THE *ORANG ASLI*: AN OVERVIEW OF THE ORIGINAL PEOPLES OF MALAYSIA

The *Orang Asli* are the indigenous people of Peninsular Malaysia who are not Muslim Malays (Malaysia's largest ethnic group). They

comprise 0.5% of the Malaysian population and are among the most marginalized and impoverished of Malaysia's inhabitants (Nicholas, 2002). Although overall poverty in Malaysia has been reduced to less than 8% in recent years, a disproportionate 81% of *Orang Asli* continue to live below the poverty line (Nicholas, 2002).

While the history of the *Orang Asli* in Peninsular Malaysia has been traced back to hunter-gatherer tribes some 25,000 years ago (Endicott and Dentan, 2004), much of what we observe of their life today is partially, if not largely, a result of government policy in the late 1940s to reduce the potential for interaction between the *Orang Asli* and the communist guerrilla movement. In 1954 the government passed the Aboriginal Peoples Ordinance and established the Department of *Orang Asli* Affairs (DOAA), a government agency charged with overseeing the indigenous groups of Malaysia. The charter of the DOAA was to provide for the protection, advancement, and well-being of the *Orang Asli* (DOAA, 2004). To achieve this end, DOAA strategically grouped *Orang Asli* tribes into jungle settlements and presented them with educational opportunities, health services, and some basic consumer items (Nicholas, 2002). DOAA also provided small parcels of state-owned land, with the intention of converting these peoples into settled farmers growing cash crops for their income (Emby, 1990).

Currently, the mission of DOAA is to “[develop] the *Orang Asli* community in line with the objectives of the country's national vision” (DOAA, 2004). This national vision, known as Vision 2020, sets out to industrialize and develop Malaysia in the areas of commerce, manufacturing, education, information-technology and infrastructure in order to double Malaysia's GDP every decade (IFPRI, 2004). This study investigates the possibility that efforts to improve the income and standard of living of the *Orang Asli* will also enhance their well-being (DOAA, 2004).

METHODS

Participants

Participants in this study were 322 heads of household from the *Jah Hut* ethnic group (pop. approximately 2600) of *Orang Asli*. Individual and household data were collected via household income surveys

TABLE I

Frequencies of male respondent ages, education levels, and household size

	Number of respondents	Percent respondents
Age		
19–29	60	19.5
30–39	92	30.0
40–49	64	20.9
50–59	42	13.7
60–69	29	9.4
70–80	20	6.5
Education level		
No school	125	40.7
Grade school	129	42.0
Form 1–3	31	10.1
Form 4–5	18	5.9
Form 6	2	0.7
College/university	2	0.7
Number of household members		
1–4	77	25.1
5–7	112	36.5
8–10	87	28.3
11–13	23	7.5
14–16	3	1.0
17–20	5	1.6

Note: Form 1–3 = Lower secondary education from age 13; Form 4–5 = Upper secondary education from age 16; Form 6 = Post-secondary education from age 18. $N = 307$.

of nine remote villages in the state of Pahang (approximately 120 miles northeast of Malaysia's capital, Kuala Lumpur). The average age of the head of household was approximately 42 years (range: 19–80) and, consistent with previous research on Orang Asli, most (82%) had little to no formal education (Nicholas, 2002) (see Table I). The mean number of members living in each household was 6.85, although more than 10% of households had more than 10 members. The main economic activity in this region is agriculture (subsistence and cash crops), and most households manage either very small landholdings or no land at all. Malaria and dengue fever are common. By most standards, the households in this sample would be considered poor. Based on participant responses, 33.6% of households had electricity, less than 13% had an indoor bathroom,

TABLE II

Frequencies material household possessions, market value, and correlation with wealth composite variable

Item	Number of households with item	Percentage of households with item	Estimated market value as used good RM (USD)	Correlation with wealth composite
Gas stove	238	77.5	150	0.36**
Motorcycle	183	59.6	2,400 (632)	0.60**
Radio	183	59.6	60 (16)	0.25**
Television	117	38.1	400 (105)	0.42**
Electricity	103	33.6	150 (40)	0.30**
Bicycle	49	16.0	80 (21)	0.15**
Indoor bathroom	39	12.7	500 (132)	0.35**
Chainsaw	26	8.5	300 (79)	0.14**
VCD player	14	4.6	150 (40)	0.09**
Generator	12	3.9	600 (158)	0.18**
Cellular phone	12	3.9	300 (79)	0.18**
Automobile	8	2.6	4,000 (1,053)	0.42**
Refrigerator	7	2.3	500 (132)	0.14**

Note: Exchange rate approximately 1 USD = 3.8 RM.

* $p \leq 0.05$.

** $p \leq 0.01$.

$N = 307$.

2.3% of the sample owned a refrigerator, and most lived in houses constructed from bamboo, thatch, or scrap wood. Table II lists the inventory of household possessions and amenities taken to gauge the affluence of each household. Since 95% of primary respondents were male, only these data ($n = 307$) will be used for the analyses.

Procedures

General survey. The survey contained questions related to household wealth (ownership of a number of varied household possessions and total household savings), individual household member characteristics (age, education, and health), and the life satisfaction of the interview respondent. The questionnaire, which was developed from previous household income surveys in Malaysia, Indonesia, and Brazil, was reviewed by anthropologists, sociologists, psychologists,

and economists prior to implementation. A team of bilingual students and professors from the anthropology, linguistics, and economics departments at the University of Malaya translated the questionnaire from English to Malay (*Bahasa Malayu*) and took care to ensure that the translation was accurate, understandable, and culturally sensitive. Similar care was taken to ensure that the SWLS (Diener et al., 1985) was understandable in the culture of the *Jah Hut*.⁶

Data collection. Approximately 28 bilingual students from the University of Malaya collected the data by means of oral interviews over a two-week period in March 2003. During the week prior to data collection, students received instruction on the survey, were trained in oral interviewing techniques, and participated in role-plays. The questionnaire was worded such that interviewers merely had to read the questions verbatim and record the responses, many of which were coded. For the actual interviews, male and female students were paired, with one student asking questions and the other recording and coding responses. It was encouraged that one male and one female adult household member be present to answer questions. Due to social custom, however, it was typically the male respondent who answered the questions. In most cases, the interview took place in the respondents' house with each interview lasting between 1.5 and 2 h. At the end of each interview, the couple was compensated 20 Malaysian ringgit (5.25 USD) for participating in the survey. In eight of the nine villages surveyed, all *Jah Hut* households were interviewed. For the largest and most homogeneous village, budgetary restrictions limited us to a probability sampling method involving every other household.

Measuring subjective well-being. The SWLS is a popular measure for examining life satisfaction (Pavot and Diener, 1993; Vittersø et al., 2002), yet has not been widely used to compare income and SWB among the poorest samples in developing countries (Howell and Howell, 2005). We chose to employ the SWLS for a number of reasons: (1) the scale uses multiple items, which when measuring the same construct tends to be more reliable than a single-item scale (Biswas-Diener and Diener, 2001), (2) these items have formed a single factor in past research when translated and administered to diverse samples (Biswas-Diener and Diener, 2001; Blatsky and

Diener, 1993; Vittersø et al., 2002), and (3) the SWLS contains questions related to life satisfaction vis-à-vis happiness.⁷

Formation of SWLS translation. The only issues of consequence that arose in our efforts to translate the SWLS from English to Malay related to the 7-item agree–disagree Likert scale response format. Our sample had difficulty understanding the varying levels of agreement and disagreement. We therefore translated each of the five SWLS items into question form and created seven discernible response options (e.g., 1 = definitely no; 7 = definitely yes; 4 = I don't know). Unfortunately, the fifth item on the SWLS (“If I could live my life over I would change almost nothing”) was awkwardly worded when converted into a question, and was thus translated to, “If you could change your life, would you change it?” Because an affirmative answer would imply dissatisfaction with life, responses to the fifth item were reverse-coded. Repeated translations and back-translations by separate groups of bilingual translators finally resulted in the measure and scale shown in Table III.

Measuring income/wealth. *Jah Hut* monthly household income is both irregular and unpredictable. Most household members are involved in seasonal agriculture, and in off-seasons may take odd-jobs or contract work, if available. Household income may be influenced by weather, crop productivity, or health of household members. For these reasons, a single time-point measure of income would not be a reliable appraisal of a household's general wealth. Thus, because the SWLS is intended to capture the SWB of one's life as a whole, we formed an income proxy that was more stable across time and could be logically compared to general SWL.

Formation of composite wealth variable. Given that the sample was poor, we assumed that any discretionary wealth (i.e., wealth in excess of the amount required to buy food, clothing, or other basic necessities) was spent on durable/luxury items or saved. Presuming that per capita expenditures on basic necessities across households were fixed and that few households engaged in extracurricular activities (dining out, recreation, travel, etc.), it was reasoned that the wealth of a household could be estimated from the values of its possessions and savings.

TABLE III
 Malay translation of SWLS, factor loadings and item total correlations, with means and standard deviations of male respondents

SWLS (Diener et al., 1985)	Malay back-translation of SWLS	Factor loadings	Mean	SD
In most ways my life is close to my ideal	In your opinion, have you reached your goals/hopes in life?	0.61	3.45*	1.63
The conditions of my life are excellent	At the moment, would you consider your life as near-perfect and good?	0.76	4.28*	1.69
I am satisfied with my life	Are you satisfied with the current status of your life?	0.77	4.42*	1.82
So far I have gotten the important things I want in life	Up until now, have you managed to get the important items/things you want?	0.58	3.06*	1.55
If I could live my life over, I would change almost nothing	If you could change your life, would you change it? reverse-coded	0.28	2.50*	1.48
Average (Questions 1–5)			3.54*	1.01
Average (Questions 1–4)			3.80*	1.17

Note: Responses given on a 7-point scale: 1 = Not at all; 2 = No; 3 = I don't think so; 4 = I don't know; 5 = I think so; 6 = Yes; 7 = Most definitely. Alpha of a four item scale = 0.64. Alpha of five item scale = 0.60.

*These items are significantly greater than or less than 4 (midpoint of scale).
N = 307.

For our study, respondents were asked to indicate whether they or someone in their household possessed any of a list of items or amenities (see Table II). This list resembles others that have been compiled to measure household wealth among poor, rural, or agrarian samples (e.g., Brinkerhoff et al., 1997; Graham and Pettinato, 2001; Pattanayak et al., 2004; Zimmer and Amornsirisomboon, 2001). While most of these studies have estimated wealth with a count of household possessions, we were hesitant to assign equal weighting to, for example, a radio, a television, and a car. We explored the use of a Guttman model, but because some assets were provided by the government and others were contributed by non-household family members, this scale demonstrated weak reliability. We reasoned that it would be most logical to assign a value-based weight to each item. Our first attempt at this involved ordering the items along an interval scale according to judged relative values. We later decided that a more accurate and objective method would be to appraise each item according to its market price as a used good, and then to sum the item values to approximate material wealth.⁸ Household savings was a self-report estimate of money saved in a bank or elsewhere. Due to the skewed nature of the savings responses – consisting of many low values to a few relatively high values- log-values were used.⁹ The wealth composite variable was formed as the sum of z -log-savings and z -material wealth for each household.¹⁰

Using Life Satisfaction of the Jah Hut to Test Hypotheses

Life satisfaction was modeled with hierarchical multiple regression in two steps. We entered the demographic variables (age, age squared, education, family size, and recent illness) in step 1 so as to capture the variance in SWL explained by these variables. The wealth composite, as well as its power polynomial, was then entered in the second step so that any additional variance explained would be unique to wealth (denoted by R^2 change). The direct effect of each variable on SWL when controlling for all other variables is represented by the standardized regression coefficients (β) associated with each variable in step 2 of the model. We also tested for the possibility of non-linear (quadratic) relationships across predictor variables jointly and separately. Although nonlinear relationships between income and life satisfaction have been found in Western samples (see Diener et al.,

1993), they do not appear to have been examined with low-income samples. Finally, we explored a variety of specifications that included interaction effects between predictor variables.

RESULTS

Validation of the Malay SWLS

To test whether the psychometric properties of the translated SWLS responses were similar to those observed in previous studies, we assessed the internal consistency, corrected item-total correlations, and factor loadings for each item using an exploratory principal components analysis (PCA). Internal consistency, measured with Cronbach's alpha, was found to have a reliability coefficient of 0.60 when all five SWLS items were included. This is on the lower end of what has been found in most previous studies (Biswas-Diener and Diener, 2001; Diener et al., 1985; Vitters et al., 2002), although similar to that found by Vittersø et al. (in press) among an adult sample of native Greenlanders ($\alpha = 0.58$). When the fifth item of the SWLS was dropped, however, the reliability coefficient increased to 0.64. Dropping any of the remaining four items decreased reliability. The corrected item-total correlations for each of the first four items were larger than 0.33, with a maximum of 0.50. However, the item-total correlation for the fifth item (after being reverse-coded) was 0.13. The low item-total correlation for this fifth item demonstrated that it was likely not tapping into the same life satisfaction construct as the other four items.¹¹ Examination of the component loadings for each item also suggested that the fifth item failed to meet the traditional standards typically assumed for the SWL construct. Other than the fifth item, all standards (components loading > 0.40 on the first component and < 0.30 on the second component) supported a single factor solution. The single 4-item factor, which explained 48% of the variance in the four items, was used as our measure of life satisfaction.

Assessing Jah Hut Life Satisfaction and its Correlates

Means and standard deviations for each item of the translated SWLS and for the entire scale are displayed in Table III. The overall mean life satisfaction score, $M = 3.80$, $SD = 1.17$, was below the midpoint of

the scale and lower than what has been typically found with the SWLS in other samples (Diener and Diener, 1996; Vittersø et al., 2002).

In order to determine predictors of life satisfaction, correlation coefficients between life satisfaction and objective household characteristics (e.g., demographic, recent household illness, and wealth variables) were computed (Table IV). For the first set of household characteristics (age, education, and household size), no statistically significant relations were found with life satisfaction. Recent household illness, as measured by the number of days the respondent could not work in the previous month due to an illness in the household, was found to have an inverse relationship with life satisfaction, $r(305) = -0.17$, $p < 0.005$. Finally, consistent with past research findings, all three wealth variables were significantly positively correlated with life satisfaction, $r(305) = 0.21$, $p < 0.005$, for material possessions, $r(305) = 0.16$, $p < 0.005$ for savings, $r(305) = 0.23$, $p < 0.005$ for the wealth composite.

Explaining Jah Hut Life Satisfaction with Hierarchical Multiple Regression

There were three goals of the regression analysis: (1) explore any non-linear relationships between objective measures (age, education, family size, recent illness, and wealth) and life satisfaction (2) examine the degree to which objective measures (and their significant power polynomials) could explain the variance in life satisfaction (step 1 of the regression model) and (3) determine the direct effect of wealth on life satisfaction when other household characteristics were held constant (step 2 of the regression model).

To determine whether any of the predictors were related non-linearly to SWB we regressed SWL onto each objective measure and its power polynomial (the objective measure squared) separately. Only age exhibited a statistically significant quadratic relationship (inverted *U*-shape) with life satisfaction. A scatter plot of the data indicated that life satisfaction increased with age, peaked around age 50, and then declined. All possible interactions between variables were also explored, and none were found to be significant.

Step 1 of the hierarchical regression model included age, age-squared, education, family size, and recent household illness as independent variables. Age was centered on its mean and family size

TABLE IV
Descriptive statistics and correlations of demographic variables (age, education, family size, and recent illness), SWLS and economic indicators (material possessions, savings and wealth composite)

	Mean	SD	1	2	3	4	5	6	7	8
SWLS (1)	3.81	1.17	-							
Age (2)	42.42	14.50	-0.04	-						
Education (3)	1.85	0.94	-0.02	-0.33**	-					
Family size (4)	6.85	3.20	-0.04	0.18**	-0.03	-				
Recent household illness (5)	1.67	5.27	-0.17**	0.06	-0.08	-0.05	-			
Material wealth (6)	RM 1561		0.21**	0.06	0.22**	0.18**	-0.12*	-		
	2,044	(USD 411)								
	538)									
Log-savings (7)	1.61	1.28	0.16**	-0.09	0.25**	0.06	-0.12*	0.24*	-	
Wealth z-composite (8)	0.00	1.57	0.23**	-0.02	0.29**	0.16**	-0.15**	0.79**	0.79**	-

Note: SWLS is average of items 1-4. Household illness is the number of days in last month that participant could not work due to illness (of self or household member). Material possessions are weighted by value of item. Savings are logged current savings. Wealth Composite is average of standardized variables: (1) total value of possessions and (2) natural log savings.

* $p \leq 0.05$.

** $p \leq 0.01$.

$N = 307$.

TABLE V

Hierarchical regression analysis with satisfaction with life regressed on demographic variables in step 1 and demographic variables and wealth in step 2

Model					
Predictor	Y-Intercept	<i>B</i>	SE	β	<i>p</i> -value
	4.33		0.235		0.000
Step 1 of hierarchical regression. $F(5, 301) = 3.289, p < 0.01; R = 0.228$					
Age		0.004	0.006	0.06	0.436
Age squared		-0.001	0.000	-0.17	0.014
Education		0.051	0.074	0.04	0.493
Family size		-0.032	0.022	-0.09	0.149
Recent illness		-0.037	0.013	-0.17	0.003
Step 2 of hierarchical regression. $F(7, 299) = 5.121, p < 0.001; R = 0.327$					
	4.56		0.241		0.000
Age		0.002	0.006	0.03	0.680
Age squared		-0.001	0.000	-0.15	0.022
Education		-0.147	0.076	-0.12	0.052
Family size		-0.043	0.022	-0.12	0.046
Recent illness		-0.031	0.012	-0.14	0.013
Wealth		0.182	0.045	0.24	0.000
Wealth squared		0.009	0.018	0.03	0.639

Note: R^2 change = 0.055; $F(2, 299) = 9.252, p < 0.005$.

was centered on 1, such that the y -intercept equaled the predicted life satisfaction for an individual of average age, who lived alone, with no education and no recent illness. Based on the F -test, this set of household characteristics was shown to be a statistically significant predictor of SWL, $F(5, 301) = 3.289, p < 0.01; R = 0.228$. Individually, however, only age-squared and recent illness were statistically significant explanatory variables, $p < 0.05$ (Table V).

In step 2 of the model, we added the wealth composite variable as both a linear and quadratic predictor of life satisfaction.¹² The addition of these two variables in step 2 of the model produced significant multiple R^2 change and F -test statistics, R^2 change = 0.055; $F(2, 299) = 9.252, p < 0.005$; indicating that wealth explained a reliable portion of the variance in the SWLS not explained by the other household variables. The standardized regression coefficient associated with the linear wealth variable, $\beta = 0.24, p < 0.001$, was larger than wealth-SWB associations reported for most Western samples and was comparable to estimates found in other developing

or transitional countries (Howell and Howell, 2005). The partial correlation between wealth and SWL (holding age, education, family size and recent illness constant) was also larger than what is normally found in Western cultures, $r(301) = 0.25$, $p < 0.001$. The standardized regression coefficient for the quadratic wealth variable was not significant.

An unanticipated result of adding the wealth variables in step 2 of the model was the appearance of significant effects in two of the demographic predictors that had been non-significant in step 1. After controlling for wealth, the family size and education variables became significantly inversely related to SWL ($p < 0.10$). The quadratic term for age remained significant in step 2, as did the inverse relationship between recent household illness and SWL.

Assessing Wealth and SWB with Latent Variables

The fact that the wealth-SWB effect size for our sample was only slightly larger than some effect sizes found in Western, wealthy samples can be explained partially by the existence of measurement error in our wealth and SWL constructs. In order to estimate the effect size with this error removed, we used structural equation modeling (SEM) to create latent variable constructs. The first four items of the SWLS were set as markers of the life satisfaction latent variable and both items from the wealth composite (material wealth and log savings) were set as markers of the wealth latent variable. With latent variable analysis, the correlation between life satisfaction and wealth increased to $r = 0.43$ (Figure 1). Fit indices indicated that the model reached adequate to good levels of fit, RMSEA = 0.058, CFI = 0.957, GFI = 0.958.

DISCUSSION

Our findings suggest that wealth explains a significant portion of the variance in *Jah Hut* life satisfaction, even when other wealth-related variables such as education, household size, and recent illness are held constant. We find the regression coefficient and partial correlation to be similar in magnitude to the effect sizes that have been found in other developing countries (Howell and Howell, 2005). Results

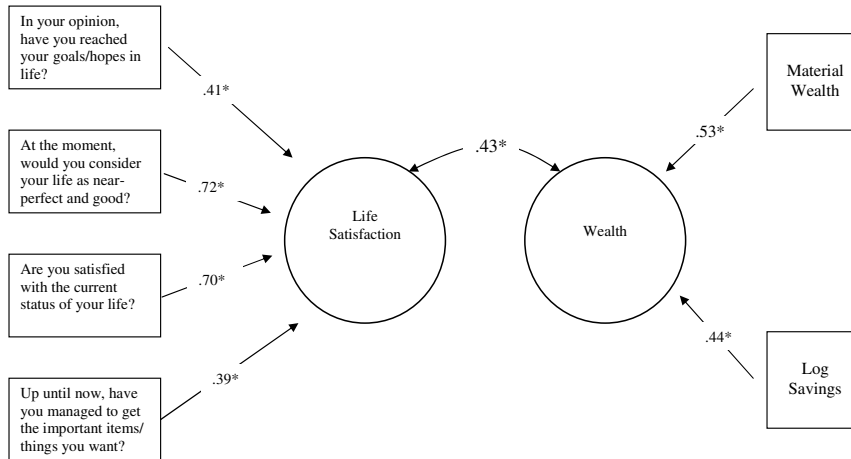


Figure 1. The correlation between the latent traits of life satisfaction and wealth.

from the regression analyses also reveal that certain demographic variables that had been previously uncorrelated with SWB become significant predictors when wealth is added to the model. Finally, when measurement error is removed from the constructs of wealth and SWL through the creation of latent variables, the strength of the wealth-SWB relationship improves drastically.

Evidence for Need Theory

While our data cannot directly test need theory, results from this study support several of its conjectures relating wealth and life satisfaction. First, need theory suggests that the wealth-SWB relationship should be stronger in developing countries than in developed countries. We find zero-order and partial correlations that exceed the typical associations of $r = 0.12$ – 0.17 reported in Western samples (Diener et al., 1993; Haring et al., 1984). Second, need theory posits that among the poor, those whose basic needs are met should be happier than those lacking basic amenities. Our assumption that, among the *Jah Hut*, any discretionary wealth was saved or spent on assets allows us to interpret our composite wealth variable (comprised of savings and household possessions) as a gauge of the degree to which a household's basic needs were met. The positive association between this composite wealth variable and life satisfaction indicates that those with more discretionary wealth (i.e. possible greater need

fulfillment) were happier than those with less. Further, this association is not explained by other demographic or household variables, demonstrating that there appears to be a direct link from wealth to life satisfaction. Finally, need theory would predict a linear relationship between wealth and life satisfaction in poor countries (rather than a curvilinear relationship) since diminishing marginal utility should only occur after basic needs have been satisfied. In our model, the wealth power polynomial is not significantly related to life satisfaction scores. This may indicate that there is not ample representation of upper-level income in this sample and/or that basic needs have yet to be met for most households.

Correcting Wealth-SWB Effect sizes for Measurement Error

While the relationship we find between wealth and life satisfaction is larger than what has been found in most Western samples, the lack of internal consistency in the variables attenuates this correlation. Shields and Caruso (2003) have argued that a measure's reliability should be considered when comparing effect sizes between samples. This may be especially true when comparing the wealth-SWL association for Western samples, which usually report high levels of internal consistency with the SWLS, with that for non-Western samples, where reliability can be low¹³ (Hofer and Chasiotis, 2003; Vittersø et al., 2002). For example, a wealth-SWL correlation of 0.23 for our sample may not appear to be substantially larger than a correlation of 0.13 for a sample of Americans. However, if we were to take Diener et al.'s (1993) American sample and correct for measurement error in the SWLS ($\alpha = 0.84$), the correlation between income and SWL would increase very little, from $r(6,913) = 0.13$ to $r = 0.15$. In our sample, however, the SWLS reliability is much lower ($\alpha = 0.64$) and when we remove the measurement error by creating latent variables of SWL and wealth, the initial effect size, $r(305) = 0.23$, increases to 0.43. Now we compare an effect size of 0.15 in a wealthy sample to an effect size of 0.43 in a poor sample and need theory appears to be strongly supported.

The Universality of Life Satisfaction

Although the Malay translation of the SWLS faces suboptimal levels of internal consistency it appears to be tapping into a single

latent construct of life satisfaction. And based on properties of the scale (forming a single factor) and the loadings of the items (similar to those reported by Diener et al., 1985), this construct appears to be comparable to what has been measured with the SWLS in past studies (Vittersø et al., 2002). We believe these results support the assertion that the structure and reliability of the SWLS are universal (Balatsky and Diener, 1993; Biswas-Diener and Diener, 2001), especially considering that (1) the *Jah Hut* sample had never been measured on a psychological variable, and (2) the items and scale format were reworded to facilitate their understanding and concept of life satisfaction. More importantly, the fact that this sample was able to comprehend questions related to SWB (less than 5% of responses were “I don’t know”), and respond fairly consistently to them, challenges the perception that SWB is understood differently across cultures and, therefore, cannot be evaluated cross-culturally.¹⁴

Wealth and Life Satisfaction: Other Correlates

When we examined the zero-order correlations between life satisfaction and demographics, we found no statistically significant relations between age, education, or household size (only recent illness was significantly negatively correlated with life satisfaction, which was expected). When power polynomials for each variable were computed and compared to life satisfaction, only the age-squared variable emerged as a potentially significant predictor. When the demographic characteristics were entered as independent variables in step 1 of the regression model, the standardized regression coefficients were very similar to their respective zero-order correlations with SWL. However, when wealth was added in the second step of the regression model significant negative effects emerged for education and family size.

Age. The relationship we find between age and SWB is very different from what has been found in other samples. Some past studies have found positive and *U*-shaped relationships between age and life satisfaction (Clark and Oswald, 1994, 1996; Graham and Pettinato, 2001; Schyns, 2002; Theodossiou, 1998; Tsou and Liu, 2001), while others have reported negative correlations with no quadratic term

(Brinkerhoff et al., 1997; Fuentes and Rojas, 2001). Among the *Jah Hut*, happiness tended to increase until about age 50 and then decrease (inverted *U*-shaped curve). This pattern was also recently found in a longitudinal study with U.S. veterans, where life satisfaction increased until age 65 and then declined (Mroczek and Spiro, 2005). Because their finding contradicted most previous research, the authors offered no conjectures for their result.

Education. Although positively correlated with wealth, education has, in fact, correlated both positively (Brinkerhoff et al., 1997; Graham and Pettinato, 2001; Seik, 2000; Tsou and Liu, 2001) and negatively (Cheung and Leung, 2004) with life satisfaction. We find a negative relationship with SWB, but only after wealth is controlled for in the regression model. That is, of respondents with the same level of wealth, the ones with more education report lower SWB than those with less education.

An investigation into this result reveals that the significance of the negative relationship is propelled by the few respondents with post-secondary or college educations ($n = 4$). These respondents report less life satisfaction (mean SWL = 3.13, SD = 1.16) than those with little or no education (mean SWL = 3.82, SD = 1.17). Specifically, their average score on item 1, "In your opinion, have you reached your goals/hopes in life?" is lower (mean = 1.64, SD = 0.96) than those with less education (mean = 3.47, SD = 2.25), and approaches significance ($p = 0.065$).

While we proceed with caution in drawing conclusions from such a small sample, Cheung and Leung (2004), whose Beijing sample faced both poverty and communism, mention that intellectuals tend to be more idealistic, are better able to make sense of their societal conditions, and can suffer from a societal structure that favors the working class and state-owned resources. These arguments could conceivably help clarify our results as well. However, another explanation might be that those who are more educated have, in the process of becoming more educated, exposed themselves to a larger, more educated, and, undoubtedly, wealthier peer group. If this is the comparison group to which they measure their current living standards (as opposed to assessing their lives relative to the less educated households in their immediate vicinity), we might conjecture that the discrepancy between their actual and

potential socioeconomic status leads them to be less satisfied with their lives.¹⁵ Future studies that can obtain larger samples of highly educated people living in poverty should further explore these various hypotheses regarding the relationship between education and SWB.

Family size. In at least two developing country samples, life satisfaction increased with household/family size (Brinkerhoff et al., 1997; Seik, 2000). In our model, however, family size is negatively related to SWB, perhaps because larger families are likely to have more dependent members. We test this hypothesis by correlating life satisfaction with the number of household members <5 years or >65 years old. We find no association between SWL and number of young household members, however, we find a significant negative relationship between SWL and the number of elderly household members, $r(305) = -0.12, p < 0.05$. Further analyses reveal that the number of elderly members is found to be significantly negatively correlated with wealth, ($r(305) = -0.15, p < 0.01$) and significantly positively correlated with recent illness, $r(305) = 0.21, p < 0.001$, both of which can represent strains on household resources, and decrease life satisfaction.

Recent illness. As expected, good health has generally correlated positively with wealth and well-being in past studies (Diener et al., 1999; Fuentes and Rojas, 2001; Saunders, 1996; Tsou and Liu, 2001; Winkelmann and Winkelmann, 1998). Our results corroborate these findings as recent household illness was significantly negatively related to SWL in both steps of the model, and only decreased slightly with the addition of wealth.

Concerns with Reciprocal Effects

While all of the aforementioned demographic variables have been identified in the SWB and economics literature as potentially impacting well-being (e.g., Gillis et al., 1996; Deaton, 1997) caution is suggested in the interpretation of the regression coefficient associated with the wealth composite, as the direction of the effect may be ambiguous. If our measures of satisfaction and wealth are either jointly determined due to some unobserved variable or if the

direction of causation also runs from SWB to income (Diener and Seligman, 2004; Lyubomirsky et al., in press), we will find that we have a misspecified model (Cohen et al., 2003). In order to minimize the problem of joint determination, our regression model included those variables known to influence both wealth and life satisfaction. Furthermore, we use a measure of wealth that is contemporaneously independent of the error term (which may not be the case for a current income measure). Finally, several elements of the wealth measure included the value of government-provided amenities and services that some households received regardless of their earnings. A test for the direction of causality between happiness and wealth would require strategies such as cross-lagged analysis, or panel estimation. Unfortunately, each of these strategies requires either additional variables that are not currently in our data set or a panel data set that includes longitudinal data (Kennedy, 1998).

CONCLUSION

Past studies of SWB have largely overlooked indigenous populations, which are almost always among the poorest and most marginalized groups in society. This study contributes a new and unique sample to the growing body of SWB research in developing countries and supports past findings that among poor groups, wealth is positively correlated with happiness. Regression analysis was used to help determine the unique effect of wealth on happiness after controlling for other associated household characteristics, such as age, education, family size and household illness. Strategies were invoked to reduce the potential for measurement error, since low reliability attenuates the relationship between these variables. Future research extensions include exploring the robustness of this model across different time periods with the same ethnic group as well as across other ethnic groups. An analysis of the correlates and predictors of life satisfaction within these communities may prove effective in informing policy to help reduce poverty and increase overall well-being through a more efficient and equitable allocation of scarce government resources.

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NOTES

¹ Classical utility theory, $U(x_1, x_2)$, describes utility (U) as a function of the consumption of any two goods or services (x_1, x_2). As long as the desire to consume the good or service is not satiated, increased consumption leads to increased utility, but at a decreasing rate (diminishing marginal utility). Income is indirectly related to utility as the vehicle with which these goods and services are obtained.

² Theories include relative income theory, adaptation theory, goal or aspiration theory, and need theory. For a review of these theories see Diener and Lucas (2000).

³ A 1984 meta-analysis found the mean correlation between wealth and happiness in developed countries to be 0.17 (Haring et al. 1984), while two U.S. national probability samples analyzed by Diener et al. (1993) revealed correlations of 0.12 and 0.13.

⁴ Some have also added health, transportation, and schooling to the list of minimum standards that should be set for a society's poorest groups of people (Moller and Schlemmer, 1983).

⁵ A review of recent literature has revealed that past studies have found both wealth and SWB to be significantly correlated with age (Biswas-Diener and Diener, 2001; Brinkerhoff et al., 1997; Clark and Oswald, 1994, 1996; Graham and Pettinato, 2001; Schyns, 2002; Theodossiou, 1998; Tsou and Liu, 2001), education (Brinkerhoff et al., 1997; Cheung and Leung, 2004; Graham and Pettinato, 2001; Seik, 2000; Tsou and Liu, 2001), health (Diener et al., 1999; Fuentes and Rojas, 2001; Saunders, 1996; Tsou and Liu, 2001; Winkelmann and Winkelmann, 1998), and family size (Brinkerhoff et al., 1997; Seik, 2000).

⁶ When conducting research with ethnic or cultural minority populations, it is critical that people familiar with these groups (ideally they are also members of these groups) be given a significant role on the research team in order to ensure methodologically sound research with accurately interpretable results (Padilla and Lindholm, 1995).

⁷ It has been suggested that since happiness is generally a temporary emotional state (Veenhoven, 1991) it may be interpreted differently in dissimilar cultures (Oishi

et al., 1999). Life satisfaction, on the other hand, tends to be a more objective and cognitive assessment of one's life as a whole and, thus, less likely to be biased by a respondent's mood (Diener et al., 1985; Shinn, 1986).

⁸ The monetary value of each item was its average price as listed in classified ads of on-line Malaysian newspapers. The values issued for electricity and indoor bathrooms were estimates of their installation costs.

⁹ Since $\ln(0)$ is undefined, log-values were computed by taking the natural log of savings + 1.

¹⁰ Other transformations of income were investigated, as well as no transformation, none of which illustrated any appreciable differences with respect to sign reversal or statistical significance.

¹¹ The fifth item of the SWLS has not performed well in some other studies examining cross-cultural samples (see Vittersø et al., 2002). For example, Hofer and Chasiotis (2003) dropped this item in their study of Zambian adolescent males because of low reliability.

¹² Although the power polynomial of wealth was not a significant predictor of life satisfaction in our exploratory regression analyses, we were interested in whether a diminishing marginal effect of wealth on SWB could be found after controlling for other household variables.

¹³ Vittersø et al. (2002) find a correlation of 0.39 ($p < 0.01$) between SWLS reliability and gross national product.

¹⁴ We thank an anonymous reviewer for this insightful comment.

¹⁵ A similar explanation has been applied to the findings of Clark and Oswald (1996), who, when controlling for income, discover that highly-educated workers express less satisfaction than the less highly-educated. They conclude that education induces greater aspirations, which if left unmet, may decrease life satisfaction (Diener and Lucas, 2000).

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