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THE RELATIONSHIP BETWEEN MEASURES OF
SUBJECTIVE AND ECONOMIC WELL-BEING:
A NEW LOOK

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ABSTRACT. The objective of this research is to examine the importance of variable specification in using economic variable to explain the variance in individual's perceived (1) overall psychological, (2) economic, and (3) non-economic well-being. Results indicate that careful specification of economic variables improves the explained variance of perceived subjective well-being. Specification of dependent variable, life satisfaction, based on a domain-specific scale, proves superior to using the response to the global satisfaction question, "How do you feel about life as a whole?" Economic variables prove significant in explaining both perceived economic and non-economic domains of life satisfaction. Although its overall effect on life satisfaction is negative, increased family size is found to enhance non-economic life satisfaction, while detracting from economic aspects of life satisfaction.

INTRODUCTION

This study will address the interesting and important issue of the relationship between a person's objective, economic well-being and subjective, psychological well-being. Despite a generation of quality of life research, the relationship between these two types of well-being has been dealt with only superficially in the literature. The literature has been particularly lax in its treatment of the economic variables, measuring them poorly, if at all. Therefore, the main contribution of this study is its potential to relate quality of life measures, as defined by sociologists and social psychologists, to more carefully constructed measures of economic well-being. It is expected that more variation in psychological well-being be accounted for by using improved measures of economic well-being rather than those measures traditionally used in quality of life research.

Psychological well-being, or satisfaction with life, has been examined by numerous sociologists and psychologists under the rubric of quality

of life issues. Many years of investigation support the operationalization and testing of concepts reflective of quality of life concerns (Campbell, *et al.*, 1976; Andrews and Withey, 1976). Quality of life measures are generally constructed from survey responses to questions regarding what makes a person's life pleasant or fulfilling; or why one chooses to move, marry, divorce, have children, and so on. The literature analyzing these self-reported assessments suggests that they do reveal people's perceptions about how they are doing.

Previous social science research has studied one's perceived psychological well-being as it is shaped by personal aspirations, life expectations, and means necessary to pursue desired ends. It has been found that when personal choices have negative consequences, those consequences may culminate into feelings of despair, disenchantment, powerlessness, estrangement, or false-consciousness (Mead, 1962; Durkheim, 1951; Merton, 1957; Wachtell, 1983). Rainwater (1974: 17) indicates that in all societies, human beings evaluate their well-being based upon the degree to which circumstances allow them to engage in 'validating activities.'

Admission into 'validating activities' in contemporary society is largely achieved through consumption and is heavily conditioned by one's financial surplus. Thus, one would expect that people's positive and negative quality of life assessments would have a strong correspondence to their acquisition and disposal of economic resources. Paradoxically, however, while a positive relationship may exist between income status and psychological well-being, it is not an exclusive relationship. Campbell (1976) characterizes it in the following manner:

There is no doubt that over the last twenty years, high income people in the United States have been more likely to describe themselves as 'very happy' than those with low incomes. Looking at five national surveys conducted between 1957 and 1978, we find an unmistakable pattern. In each of these years, the proportion of 'very happy people' is higher as we move from low-to-high income levels. A very stable relationship, but by no means an exclusive one. Even among the most affluent, there are a large minority who describe themselves as less than very happy, and a sizeable minority of the least affluent claiming that they are very happy. Happiness is far from the exclusive domain of the well-to-do.

In the surveys referred to by Campbell, as in most research conducted by sociologists or psychologists, the measure of economic affluence is 'current income' (e.g., Dohrenwend, 1973; Clemente and

Sauer, 1976; Allardt, 1977; Danziger, 1980; Fernandez and Kulik, 1981; Link, 1982; Hofferth, 1983; Mutran and Reitzes, 1984; and McLanahan, 1985).

Current income alone is an unstable predictor of well-being in that it does not accurately reflect consumer consumption or savings behavior, nor does it reflect other components of financial security which undoubtedly contribute to a sense of well-being. To accurately evaluate and account for the economic resource effects on psychological well-being, it is critically necessary to investigate whether current income adequately represents the relevant economic influences on well-being.

The significance of this effort may be summarized by the specific aim of discovering if a more rigorously defined measure of economic well-being can illuminate the relationship between the economic domain and psychological well-being. Such an effort will advance the literature in two different areas: first, the economic literature contains a wealth of theoretical and empirical efforts aimed at developing accurate measures of economic well-being (Garfinkel and Haveman, 1977; Smeeding, 1977; van der Gaag and Smolensky, 1982). Yet, it is not the objective of those scientific efforts to explain the relationship between quality of life and improved measures of economic well-being. This study will perform that function.

The second contribution of this study is enhancement of the social-psychological literature by adopting alternative measures of well-being to that conventionally employed in the quality of life studies. The authors will examine the effect of more rigorously defined and conceptually superior measures of overall as well as economic and non-economic domains of psychological well-being as used by quality of life researchers (Andrews and Withey, 1976; Ackerman and Paolucci, 1983).

METHODS

Our study uses survey data from the *Wisconsin Basic Needs Study* (BNS), gathered by the Institute for Research on Poverty at the University of Wisconsin-Madison. The BNS was conducted to ascertain information on household expenditures, income and other economic and demographic characteristics. Respondents, whose selection is de-

scribed below, were interviewed five times in the course of 18 months. They also recorded daily expenses in diaries for three two-week periods.

The first personal interview collected background demographic information on the respondents¹ and other household members.² In addition, information was collected on 1980 household income (separate amounts for 30 sources of income), and evaluations of personal well-being. Information from the subsequent telephone interview were used in this study to identify monthly expenses,³ monthly income, debt balances, changes in household demographics, and subjective evaluation of well-being.

Respondents also completed three two-week diaries of all expenses during the months to which their telephone interviews referred. This procedure was intended to measure food expenditures and other frequently recurring financial outlays, such as for personal care products and gasoline.

Telephone screening of the 2 718 households originally selected for the BNS sample was done through random-digit-dialing within pre-specified geographic areas to locate households where (a) the head of household was 65 years or older, or (b) the head of the household was female and there were children but no male adult present in the household, or (c) the monthly income of the household fell below 144 percent of the 1980 Food Stamp eligibility level. The number of completed first personal interviews was 1,816, or 67 percent of the entire original sample. The Institute, which collected the data, developed a weight, used in this analysis, to correct for the effects of oversampling and non-response. The use of that weight allows us to ensure that our results are generalizable to the underlying population.

There were also two additional sources of attrition; those respondents who could not be located for the follow-up telephone interview and those who did not complete the expenditure diary. Two hundred and forty respondents could not be located for the first telephone call interview. The diary completion rates were about 80 percent of the telephone survey. To correct for potential biases that arise from these effects, a weighting procedure developed by Heckman (1979) to correct for sample selection bias was also conducted. It was hypothesized that family income, region of the state (urban versus rural), respond-

ent's age, education and gender would relate to the probability that a respondent would have completed all segments of the survey. The results of those analyses are reported in Appendix A and indicate that none of the variables were significant. However, the inverse of the Mill's ratio, lambda, was calculated and included in the final regressions to formally test for the possibility of sample selection bias.

For purposes of this study the focus was on families rather than individuals prior to their forming independent family units. Thus, we *eliminated* single individuals under 40 years of age. For simplicity in modeling financial resource interdependencies, we also eliminated respondents with own children over 30 years of age living at home, and households where either non-relatives or extended family members were present. The final sample size was 765. Descriptive statistics for the sample are presented in Table I.

TABLE I
Weighted sample means and standard deviations

	Mean	Std. Dev.
Family Income	\$20 765	14312
Family Size	2.71	1.48
Total Monthly Expenditures	\$1 551	1283
Expenditures/Md. Income	1.41	1.16

MODEL

Our specific aim is to analyze the relationship between objectively measured economic and perceived psychological well-being to determine if any further insights about the relationship of interest can be gained by using more thoughtful measures of both. To do this we begin by using weighted least squares (correcting for sample selection bias) to examine first the simple relationship between respondent's reported overall life satisfaction with current family income and family size. Using the same dependent variable, we then examine the relationship of psychological well-being with family size and a more carefully constructed measure of income. Finally we examine those same inde-

pendent variables relationship with three constructed measures of psychological well-being. Hence a general specification of the final estimating equations is:

$$Y = a_0 + a_1^*X + a_2FS + e$$

where:

- Y is psychological well-being
- X is a vector of family economic well-being measures
- FS is a measure of family size, and
- e is random error component.

VARIABLES

Psychological well-being

Many scales have been created by sociologists or psychologists to measure psychological well-being.⁴ Four dependent variables are used in this analysis to measure psychological well-being. The first was taken from Campbell, Converse and Rodgers' (1976) seven-point satisfaction scale (7 equals 'delighted'; 1 equals 'terrible'). It is a global measure representing a response to the question: How do you feel about your life as a whole? A criticism of this scale is that it contains skewed distributions for many life domains, i.e., one-half to two-thirds of the respondents selected one of the two 'most satisfied' categories as representing their feelings about certain aspects of life. In other words, the 'more satisfied' selections may have included people who were 'merely satisfied' as well as others who were totally satisfied. This suggests the need for developing a more rigorous scale that separates categories, reduces skew, and yields a more meaningful relationship (Colasanto *et al.*, 1984).

The second measure of overall life satisfaction is a modification of the Andrews and Withey Delighted-Terrible Scale (D-TS), constructed from several (rather than a single) domain-specific scales. Information from those scales was aggregated (summed) to construct a conceptually equivalent global measure. In this way Andrews and Withey's D-TS improved the satisfaction scale by adding 'more affect', thus reducing the skew, and designed the D-TS to provide more differentiation

among a larger group of satisfied people who did not feel equally positive about their lives (1976: 207). They found that the multi-scale D-TS measure did, in fact, provide greater differentiation at the positive end of the scale, and also resulted in more variation than the single indicator satisfaction scale.

In this work the second measure of life satisfaction is constructed by conducting a single common factor analysis on responses to a total of fourteen domain-specific satisfaction items asked in the BNS. By using a maximum likelihood procedure, we thus ascertained a factorial structure among the observed domain-specific items from examination of their covariance structure. Table II presents those findings. Because three of the fourteen items relate to job satisfaction, separate factor loadings were calculated for employed versus non-employed respondents. The eigen value (characteristic root) of the underlying factor for the employed subsample was 4.02 and accounts for about 29 percent of

TABLE II
Factor analysis of satisfaction indicators for employed vs. unemployed respondents

Satisfaction Indicators	Weights	
	Employed	Unemployed
Economic Factors:		
Physical Needs	0.468	0.627
Government & Economy	0.318	0.355
Standard of Living	0.653	0.750
Financial Security	0.709	0.848
Cost of Basic Necessities	0.558	0.462
Household Income	0.701	0.849
Pay & Fringe Benefits	0.560	—
Non-Economic Factors:		
Family Life	0.487	0.331
Accomplishments & Problems	0.501	0.354
Fun & Enjoyment	0.559	0.564
House/Apartment	0.445	0.391
Health	0.324	0.418
Job	0.587	—
Where You Work	0.455	—

the covariance among the fourteen indicators. The eigen value (characteristic root) of the underlying factor for the unemployed subsample was 3.62 and accounts for about 33 percent of the covariance among the eleven indicators. To account for the different number of items used for the two groups, factor weighted satisfaction indices were created and their sum divided by the number of relevant items. This procedure was intended to provide comparable indices that retain the 1 to 7 scale for each group.

All the observed satisfaction indicators were positively related to the underlying factor, overall life satisfaction, and each carried a factor weight greater than 0.3. For both the employed and unemployed respondents, satisfaction with, Standard of Living, Financial Security, and Household Income loaded the highest. Given that many of the unemployed respondents were retired, it is not surprising that satisfaction with Health and Physical Needs weighted heavier than that of their employed counterparts.

Two additional perceived satisfaction variables were also created to isolate the domains of economic and non-economic life satisfaction.⁵ The economic domain measure of life satisfaction was calculated by summing the factor weights associated with economic factors (see Table II) and dividing by the number of items. Similarly, the non-economic domain measure of life satisfaction was calculated by summing the factor weights associated with non-economic factors and dividing by the number of items.

Economic Well-Being

For our purposes, the notion of economic well-being arises from the 'utility' concept in consumer economic theory. 'Utility' is considered to be a concept reflective of overall well-being and derived through maximizing one's consumption of goods, services and leisure subject to price and income constraints (Deaton and Muellbauer, 1980). Specifically, the economic well-being measure we chose for this analysis is Relative Income, as attributed to Duesenberry (1949) who explained cross-section consumption behavior by theorizing a strong tendency for people to derive satisfaction from 'emulating' their neighbors' or reference group's *consumption* behavior. His hypothesis was that high

TABLE III
Regression results of overall life satisfaction on economic variables (standard errors in parentheses)

Variable	Dependent Variable			
	Global Satisfaction	Weighted Satisfaction	Global Satisfaction	Weighted Satisfaction
Constant	4.343** (0.988)	3.081** (0.460)	1.067 (1.242)	1.673** (0.664)
Income	0.141 (E-04)** (0.396 (E-05))	0.572 (E-05)** (0.183 (E.05))	—	—
Family size	0.173 (E-01) (0.272E-01)	-0.485 (E-01)** (0.116E-01)	-0.163 (E-02) (0.279E-01)	-0.562 (E-01)** (0.131E-01)
ln Income	—	—	0.390** (0.279E-01)	0.165** (0.370E-01)
Difference	—	—	-0.065 (E-03)* (0.032 (E-03))	-0.031 (E-03)* (0.015 (E-03))
Lambda	1.346 (1.536)	-0.718 (0.715)	1.072 (1.309)	-0.803 (0.717)
Adjusted R ²	0.028	0.063	0.046	0.088
Chi-Square	24.911**	52.879**	39.795**	74.642**

*, ** Significant at the 0.05 and 0.01 levels respectively.

income consumers would have lower average propensities to consume and low income consumers higher average propensities to consume as they attempted to behave like the average consuming unit.

In our work we operationalize the Duesenberry 'emulation' hypothesis by examining current household expenditures⁶ net sample average expenditures, holding income constant, thus capturing the 'relative' nature of economic well-being. On this 'difference' measure, negative values correspond to consumption at levels below the sample mean, with positive values indicating consumption above the mean. Thus, other things equal, we would expect a positive relationship between this relative consumption variable and life satisfaction. Further, rather than including the conventional dollars of income measure, we used the natural log of income so as to allow for the diminishing marginal utility one receives from money.

In addition to measures of economic well-being, it is also necessary to include family size as an indicator of family needs. We would expect

that an increase in family size would diminish not only overall life satisfaction but also economic and non-economic aspects of life satisfaction, because a given amount of resources, both time and money, would have to be reallocated among family members.

RESULTS

The results of the overall satisfaction analyses are presented in Table III. Equations where the response to a global satisfaction questionnaire item is used as the dependent variable are labeled as 'Global Satisfaction'. Equations where the (weighted) constructed overall satisfaction measure is used as the dependent variable are labeled as 'Weighted Satisfaction'. As indicated by the insignificance of the variable, LAMBDA, sample selection bias did not prove to be a problem in any of the model specifications.

Overall we find the percentage of variance explained, as measured by the adjusted R^2 , increases when (1) the weighted life satisfaction variable is used and (2) current income is logged and supplemented with the relative consumption measure. The first two equations (left-most side) presented in Table III represent the standard specification of economic variables currently found in the life satisfaction literature. In those equations, family income is positively related to a global feeling of satisfaction. This is consistent with findings reported in the literature review. Although family size is insignificant in the global satisfaction specification, it is significant and negative, as expected, in the weighted satisfaction specification.

The third and fourth equations in Table III (right-most side) represent replacement of the conventional economic measure, annual income (in dollars), with the log of income and the addition of an expenditure difference variable.⁷ Family size in this specification remains significantly and negatively related to the weighted life satisfaction measure.

In the weighted specification, the difference variable is significant and *negatively* related to satisfaction. In terms of the relative income hypothesis that motivated the original hypothesis, this finding is counter to what was expected, and implies that families with below-average total consumption are likely to report being more satisfied than their coun-

terparts with above average consumption levels. One explanation of this counter intuitive result is that, holding income constant, below average consumption may be reflecting the effects of above average savings, whereas above-average consumption may reflect the effects of above average debt on overall life satisfaction. That is, given income level, (dis)savings is determined by the value of total expenditure, it is possible that the negative relationship could be reflecting the greater financial security of those who are able to save more, as well as insecurity about debt for those who cannot.

Table IV presents the effects of objectively measured economic variables on the independent domains of perceived economic and non-economic life satisfaction. Interestingly, similar results are noted among the findings for overall, economic, and non-economic life satisfaction. The relative consumption model specifications are again the most robust, with increased adjusted R^2 's noted for those equations. Economic variables account for about 10% of the explained variance in that economic satisfaction model. Of note is that the relative consump-

TABLE IV
Regression results of economic and non-economic life satisfaction domains on economic variables (standard errors in parentheses)

Variable	Dependent Variable			
	Economic Satisfaction		Non-Economic Satisfaction	
Constant	3.809** (0.600)	2.409** (0.931)	2.212** (0.258)	0.737* (0.354)
Income	0.630** (0.248) (E-05)	—	0.550** (0.105) (E-05)	—
Family size	-0.114** (0.200) (E-01)	-0.119** (0.232) (E-01)	0.280** (0.866) (E-02)	0.159 (0.886) (E-02)
ln Income	—	0.174** (0.559) (E-01)	—	0.165** (0.214) (E-01)
Difference	—	-0.463 (E-04) (0.270) (E-04)	—	-0.127 (E-04) (0.103) (E-05)
Lambda	-1.356 (0.928)	1.556 (0.966)	0.380 (0.400)	0.758 (0.364)
Adjusted R ²	0.086	0.098	0.77	0.115
CHI-Square	-71.600**	-82.662**	-64.550**	-97.478**

*, ** Significant at the 0.05 and 0.01 levels respectively.

tion economic model accounts for about 12% of the explained variance in the non-economic satisfaction model.

The one variable whose sign does vary between the economic and non-economic satisfaction models is family size. As hypothesized, family size is negatively related to perceived economic satisfaction. However, holding income constant, increased family size results in increased satisfaction with non-economic life satisfaction domains.

Income is a significant (positive) predictor of both non-economic and economic life satisfaction. However, relative consumption (DIFFERENCE) is not a significant determinant in either model. This insignificance may be attributable in part to its collinearity with other variables.⁸ Given multicollinearity, bias would not be a problem, but efficiency would be a concern. Thus it is worth noting that in the Duesenberry models, relative consumption (DIFFERENCE) is significant in the economic satisfaction model, and FAMILY SIZE in the non-economic satisfaction model at the 10% level.

CONCLUSIONS

There are several notable findings from these results. One is that careful specification of life satisfaction domains and economic variables are important when attempting to maximize explained variance of the former. Consistent with the findings of previous authors, we found that a multi-indicator overall life satisfaction scale proved superior in application, increasing models explained variance. Further we were able to successfully modify Andrews and Withey's multi-indicator scale and apply it with reliability to a sample of people for whom all of the individual indicators did not apply.

We noted a strong non-linear relationship between all domains of life satisfaction and family income, a result consistent with the economic concept of diminishing marginal utility. That is, holding constant other factors, family income is positively related to not only overall life satisfaction, but also economic and non-economic domains of life satisfaction.

Further, holding income constant, we found that modeling Duesenberry's emulation hypothesis by including not only income but also a relative measure of family consumption (DIFFERENCE), significantly

increased the total explained variance in the overall life satisfaction model. Although the sign in the overall life satisfaction model was not consistent with our *a priori* notions about Duesenberry's consumption emulation theory, it did lead our thinking in a couple of new directions. First, there is a need to further investigate the possible role of savings and debt in determining life satisfaction. It would seem that not only does relative debt influence overall satisfaction, but as own consumption exceeds that of average societal consumption holding income constant, ones perception of overall satisfaction is significantly diminished. That is, household debt has a negative impact on ones overall perceived life satisfaction.

However, relative consumption was significant in *neither* the economic nor non-economic life satisfaction models. This result may be due to estimator inefficiency, but in any event, relative consumption more strongly contributed to the economic than non-economic life satisfaction domains.

Finally, we noted the interesting result that family size contributes positively to one's perception of non-economic life satisfaction, while detracting from economic aspect of life satisfaction. However, the overall life satisfaction model would indicate that the economic domain effects of family size outweigh the non-economic domain, since family size is, significantly, negatively related to perceived life satisfaction. More research is needed to investigate whether size effects on either economic or non-economic life satisfaction domains can be isolated to particular stages of the life cycle.

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APPENDIX A
Results of probit regression used to calculate lambda in sample selection model.

Variables	Coefficient	Standard Error
Constant	0.352	0.148
Family Income	0.030 (E-04)	0.025 (E-04)
Respondent Education	-0.193 (E-02)	0.122 (E-01)
Respondent Gender (Equals 1 if male)	0.082 (E-01)	(0.075)
Urban indicator	-0.115	(0.080)

$R^2 = 0.003$

$\chi^2 = 24.491$

NOTES

¹ The respondent was defined as the individual with the most responsibility for the household's finances.

² Households were defined as 'the set of people at one address who are related either by blood, marriage, or other legal arrangement, or who share major expenses.'

³ Expenses for the previous month were recorded within these expenditure categories: utility expenses, housing, loan payments, new vehicles, tools, photographic equipment, exercise or recreational equipment, major appliances and furniture, small electrical appliances, medical services, insurance, household services, alimony, child support, education, trips or vacations, repairs or maintenance, and clothing and other household items.

⁴ See for example Campbell, Converse and Rodgers (1976).

⁵ We are indebted to an anonymous reviewer for encouraging us to pursue these relationships.

⁶ Annual expenditures are calculated as monthly expenditures times twelve.

⁷ In our early work on this project we demonstrated that a non-linear specification of income increased the model's explained variance as witnessed by an increased adjusted R^2 . Results are available from the authors upon request.

⁸ Both income and family size have significant simple correlations with consumption.

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