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Andrew J. Oswald
Stephen Wu

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Andrew J. Oswald
University of Warwick
and IZA

Stephen Wu
Hamilton College

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P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

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ABSTRACT

Objective Confirmation of Subjective Measures of Human Well-being: Evidence from the USA*

A huge research literature, across the behavioral and social sciences, uses information on individuals' subjective well-being. These are responses to questions – asked by survey interviewers or medical personnel – such as "how happy do you feel on a scale from 1 to 4?" Yet there is little scientific evidence that such data are meaningful. This study examines a 2005-2008 Behavioral Risk Factor Surveillance System random sample of 1.3 million United States citizens. Life-satisfaction in each U.S. state is measured. Across America, people's answers trace out the same pattern of quality of life as previously estimated, using solely non-subjective data, in a literature from economics (so-called 'compensating differentials' neoclassical theory due originally to Adam Smith). There is a state-by-state match (r = 0.6, p < 0.001) between subjective and objective well-being. This result has some potential to help to unify disciplines.

One-Sentence Summary:
In a sample of one million Americans across 50 states, there is a close match between people's subjective life-satisfaction scores and objectively estimated quality of life.

JEL Classification: I31

Keywords: happiness, well-being, compensating differentials, spatial equilibrium

Corresponding author:

Andrew J. Oswald
Department of Economics
University of Warwick
Coventry CV4 7AL
United Kingdom
E-mail: andrew.oswald@warwick.ac.uk

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This paper is about to be published in Science. For copyright reasons, it is not possible to give the full text here. But one downloadable copy is legally available to anyone to read. That copy is provided at the top of Andrew Oswald's website. It can be found by following the links on www.andrewoswald.com. An introduction to the Oswald-Wu paper appears below.

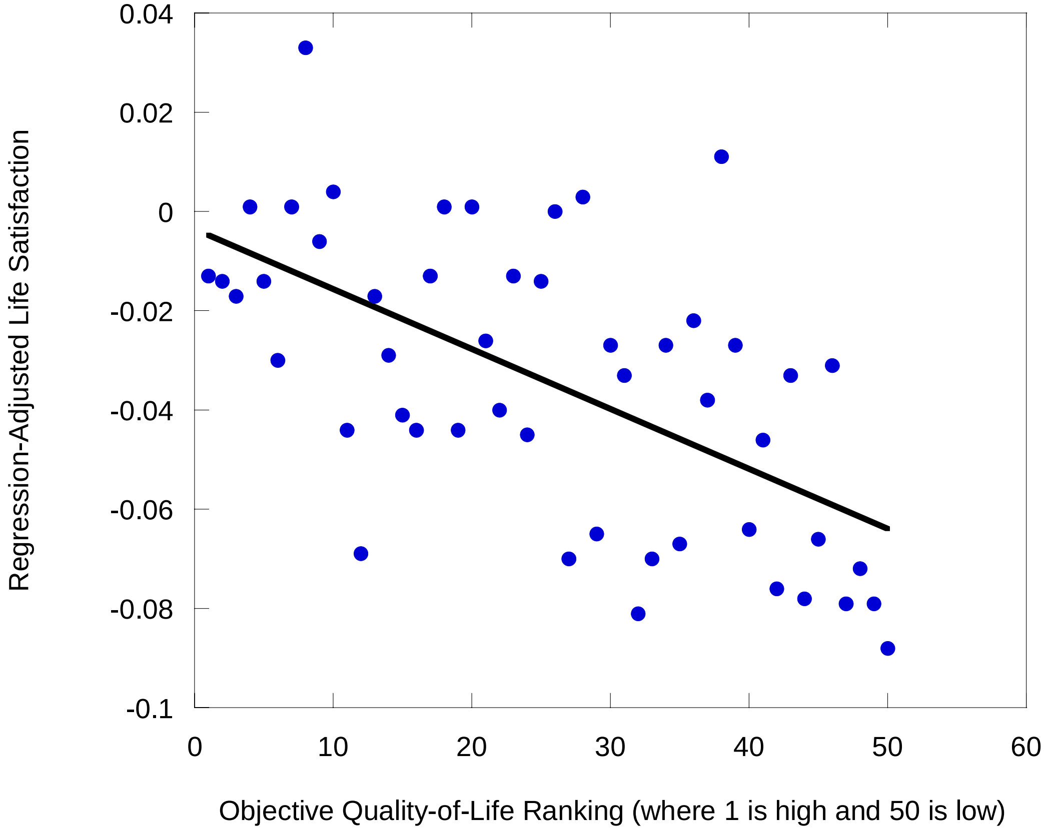
The concept of human well-being is important but difficult to study empirically. One approach is to listen to what human beings say. Research across the fields of psychology, decision science, medical science, economics, and other social sciences draws upon questionnaire data on people's subjective well-being. These are numerical scores (e.g. from very satisfied…very dissatisfied) in response to survey questions such as: how happy are you with your life? Sample sizes in these statistical analyses typically vary from a few dozen individuals in a laboratory to many tens of thousands of people in a household survey.

If reported well-being numbers provide accurate information about human experience -- so are not merely random, deliberately or accidentally untruthful, or irredeemably affected by the possibility that they may not be comparable from one person to another -- such data offer important intellectual opportunities to research scientists and practical ones to policy-makers. However, currently there is little empirical evidence, of the sort able to convince a skeptic, that they do. Perhaps the closest to a validation (of the believability) of subjective well-being scores is the finding that there are correlations between reported happiness and blood pressure, and between emotions, relative reward, and the brain. This argument, while suggestive, faces a difficulty. The demonstration of a statistical link between physiological measures and subjective well-being answers usefully establishes that the latter are not random numbers. But skeptics can reasonably argue that it does little more than that. Biological indicators are not themselves unambiguous measures of human happiness or unhappiness.

This study focuses not on people but on places. Places have characteristics that human beings find objectively pleasant (Hawaiian sunshine or Colorado scenery) and unpleasant (Connecticut land prices or New York City traffic fumes); many are cardinally measurable. The study blends new data from the United States Behavioral Risk Factor Surveillance System (BRFSS), elements of the economist's compensating-differentials theory, and recent research on so-called amenity effects in happiness regression equations.

The study's principal contribution, Figure 1, offers a possible bridge between different ways of thinking -- between, in particular, the fields of hedonic psychology and neoclassical economics (the latter has traditionally been hostile to the use of data on subjectively reported feelings). It offers a cross-check on the spatial compensating-differentials theory of economics and regional science. It may also be relevant to the work of behavioral scientists, geographers, applied psychologists, and mental-health specialists. The study's finding suggests that subjective well-being data contain genuine information about the quality of human lives.

Figure 1



Fitted Equation: *Adjusted Life Satisfaction = -0.0035 – 0.0012 Objective Rank* *R=0.598*

Each dot is a state. The correlation is significant at $p<0.001$ on a two-tailed test. This figure plots state dummy coefficients from a life-satisfaction equation against state rank in quality-of-life from the compensating differentials results of Gabriel et al (2003). Life satisfaction is coded for each individual from a score of 4 (very satisfied) to 1 (very dissatisfied). On the y-axis, the regression controls for household income as well as the survey respondent's gender, age, age squared, education, marital status, unemployment, and race, and also year dummies and month-of-interview dummies. Alabama is included. Washington DC is omitted from Gabriel et al (2003) and thus here. The bottom right hand observation is New York. Question wording in the BRFSS questionnaire is:

In general, how satisfied are you with your life?

(Questionnaire Line 206)

1 Very satisfied
2 Satisfied
3 Dissatisfied
4 Very dissatisfied

Table 1. Two Ways of Measuring the Quality of Life in America

	BRFSS Life-Satisf. Equation: State coefficient dummy-variable values [95% confidence interval]	Objective state quality-of-life rank: comp. diff. method (Gabriel et al 2003)
Alaska	-.013 [-.018, -.008]	23
Arizona	.001 [-.002, .005]	20
Arkansas	-.017 [-.019, -.015]	3
California	-.076 [-.080, -.072]	42
Colorado	-.027 [-.030, -.024]	34
Connecticut	-.081 [-.084, -.078]	32
Delaware	-.027 [-.029, -.025]	30
District of Columbia	-.048 [-.051, -.045]	N/A
Florida	.004 [.002, .006]	10
Georgia	-.021 [-.023, -.020]	36
Hawaii	.011 [.004, .018]	38
Idaho	-.014 [-.017, -.011]	5
Illinois	-.072 [-.074, -.069]	48
Indiana	-.078 [-.080, -.077]	44
Iowa	-.041 [-.044, -.038]	15
Kansas	-.044 [-.046, -.041]	19
Kentucky	-.045	24

	[-.047, -.043]	
Louisiana	.033	8
	[.032 , .034]	
Maine	-.006	9
	[-.009, -.003]	
Maryland	-.066	45
	[-.069, -.064]	
Massachusetts	-.070	27
	[-.073, -.068]	
Michigan	-.079	49
	[-.081, -.077]	
Minnesota	-.031	46
	[-.034, -.027]	
Mississippi	.001	7
	[.000, .001]	
Missouri	-.064	40
	[-.066, -.062]	
Montana	.001	4
	[-.002, .004]	
Nebraska	-.044	16
	[-.047, -.041]	
Nevada	-.065	29
	[-.068, -.062]	
New Hampshire	-.033	43
	[-.036, -.030]	
New Jersey	-.078	47
	[-.081, -.075]	
New Mexico	-.029	14
	[-.034, -.024]	
New York	-.088	50
	[-.090, -.085]	
North Carolina	-.013	17
	[-.015, -.012]	
North Dakota	-.030	6
	[-.032, -.027]	
Ohio	-.070	33
	[-.071, -.068]	
Oklahoma	-.026	21
	[-.029, -.024]	
Oregon	-.040	22
	[-.044, -.037]	
Pennsylvania	-.067	35

	[-.069, -.065]	
Rhode Island	-.068	12
	[-.071, -.066]	
South Carolina	.001	18
	[.000, .002]	
South Dakota	-.014	2
	[-.017, -.010]	
Tennessee	.003	28
	[.001, .004]	
Texas	-.014	25
	[-.018, -.010]	
Utah	-.026	39
	[-.030, -.023]	
Vermont	-.017	13
	[-.020, -.014]	
Virginia	-.033	31
	[-.035, -.031]	
Washington	-.046	41
	[-.049, -.042]	
West Virginia	-.044	11
	[-.046, -.042]	
Wisconsin	-.038	37
	[-.040, -.035]	
Wyoming	-.013	1
	[-.016, -.010]	
Constant	3.363	
# Observations	1,213,992	
R-squared	0.115	

Alabama is included in the data (and in Figure 1). It is the base category, against which the other states' coefficients are normalized. In effect, Alabama has a life-satisfaction coefficient of zero (and a ranking of 26 in Gabriel et al 2003). The standard errors were adjusted for clustering.

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