



THE INFLUENCE OF THE NATURAL ENVIRONMENT AND CLIMATE ON LIFE SATISFACTION IN AUSTRALIA

**A paper presented at the 55th Annual AARES National
Conference, Melbourne 8-11 February 2011**

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BACKGROUND

There is a growing body of literature in the area of life satisfaction, or the 'economics of happiness'.

At an individual level, the literature pays a great deal of attention to 'internal factors' that influence self-reported life satisfaction.

'External factors' have been explored to a much lesser extent.

AIM

This paper seeks to improve our understanding of the link between the natural environment, climate and well-being.

More specifically, we explore the influence of a range of environmental and climatic variables on self-reported life satisfaction in Australia.

LITERATURE

We build on a small, but growing, body of literature. In particular:

Brereton, F., Clinch, J., Ferreira, S. 2008. Happiness, geography and the environment. *Ecological Economics* 65(2), 386-396.

Carroll, N., Frijters, P., Shields, M. 2009. Quantifying the costs of drought: New evidence from life satisfaction data. *Journal of Population Economics* 22(2), 445-461.

Smyth, R., Mishra, V., Qian, X. 2008. The environment and well-being in urban China. *Ecological Economics* 68(1-2), 547-555.

METHOD

We develop two models of life satisfaction. The first (Model 1) includes only *internal* variables.

Model 1 takes the form of an indirect utility function for individual i in location k as follows:

$$U_{i,k} = \alpha + \beta x_{i,k} + \varepsilon_{i,k} \quad i=1 \dots I, k=1 \dots K$$

Where x is a vector of socio-economic and demographic characteristics.

In the microeconomic function the individual's true utility is unobservable; hence self-reported life satisfaction is used as a proxy.

METHOD CONTINUED

Model 2 includes both internal *and* external variables, and as such augments Model 1 with environmental and climatic variables of interest.

Model 2 is as follows:

$$U_{i,k} = \alpha + \beta x_{i,k} + \gamma a_{i,k} + \varepsilon_{i,k} \quad i=1 \dots I, k=1 \dots K$$

Where a is a vector of spatial factors (some of which may vary at an individual level) and x is defined as for Model 1.

DATA

The measure of self-reported life satisfaction and the various internal socio-economic and demographic characteristics are obtained from the Household, Income and Labour Dynamics in Australia (HILDA) survey.

The life satisfaction variable is obtained from individuals' responses to the question:

'All things considered, how satisfied are you with your life?'

It is an ordinal variable, the individual choosing a number between 0 (totally dissatisfied) and 10 (totally satisfied).

DATA CONTINUED

Wave 5 of the HILDA dataset is used, as this allows us to control for personality traits through the inclusion of the so-called taxonomic 'Big Five'.

The external (Model 2) variables are obtained from the Australian Bureau of Statistics' Census of Population and Housing, and Geographic Information Systems (Bureau of Meteorology and NAVIGATE Pty Ltd.).

MODEL ESTIMATION

Two techniques are employed in model estimation, OLS and ordered probit estimated by maximum likelihood estimation.

In theory, choice of estimation technique is driven by whether self-reported life satisfaction is considered ordinal or cardinal.

In practice however, OLS and ordered probit estimates of the determinants of life satisfaction are very similar.

MODEL 1 RESULTS OVERVIEW

Model 1 (p. 31):

- Adj. R^2 0.1704 a respectable figure within the literature.
- Mostly statistically significant results consistent with the literature.
- Direct controls for personality traits increase explanatory power by 66%, all statistically significant at the 1% level.

MODEL 2 RESULTS (ADJ. R²=0.1748)

Variable name	OLS estimate	Variable name	OLS estimate
Major city	-0.0974 ***	Rainfall	0.0030
NP per capita	1.8955 **	Max. temp.	0.0508 **
Distance to UP	0.0070 **	Min. temp.	-0.0384 **
Distance to UP ²	-0.0001 **	Sunshine	-0.0443 **
On coast	0.1033 ***	Wind speed	0.0145
Distance to river	-0.0006 *		
Distance to lake	-0.0003		
Distance to creek	0.0010 ***		

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DISCUSSION

Inclusion of external variables leads to a modest improvement in explanatory power.

However, many of the coefficients associated with the natural environment and climate are statistically significant.

The fact that external effects persist, suggests models of choice that assume rationality and efficiency of markets are deficient.

It is highly likely that these effects are enduring.

ACKNOWLEDGEMENTS

We thank Griffith University Business School for the Griffith Business School Honours Scholarship funding, which was instrumental in facilitating this research.

Additionally, this research would not have been possible without data provided by NAVIGATE Pty Ltd, the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs, the Australian Bureau of Meteorology and the Australian Bureau of Statistics.

Questions?