Human Well-being and Causality in Social Epidemiology

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<u>Abstract</u>

This paper discusses the work of Ballas and Dorling on life events and happiness. I believe epidemiologists have things they could learn from economists (and vice versa). Here I emphasize the issue of how to establish causality, and try to suggest some ways forward.

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Economists have much to learn from social epidemiologists. But perhaps economists can teach epidemiologists some useful things.

My profession is not alone in being obsessed with cause and effect. Economists teach students from their first university term about identification theory, instrumental variables, and why classical ordinary least squares regression equations will produce the wrong answers if some of the independent variables are endogenously determined. An oft-used example is in equations where the dependent variable is people's rates of pay and one of the independent variables is their level of education. Education is endogenous -- chosen by the person. So we teach our students <u>not</u> to read off the coefficient on education in a wage equation and claim that that measures the size of the causal effect.

The fine paper by Ballas and Dorling **[1]** made me think about causality, because they take reported life events and use those as independent variables in a well-being regression equation. It is easy to admire the originality of their work. If there is a more important topic in social science than the study of human happiness -- we could use the words 'good mental health' -- it is hard to think what it might be. Economists also work on these issues, and Richard Easterlin was a particular pioneer. **[2,3]**

Epidemiologists traditionally focus on physical health; yet in a modern society the main reason that health matters is presumably because it is a fundamental determinant of people's happiness.

I found it illuminating to read the first volume of the International Journal of Epidemiology in 1972:

> *"By mid-twentieth century ... people as a whole were not disease-ridden, and ideas of so-called positive health emerged. This emboldened the WHO to define health in a new way as 'physical, mental and social well-being, not merely the absence of disease or infirmity'...Medicine would then focus on improving health in the sense of (i) moving people toward the favorable end of the health spectrum, as determined subjectively by responses to questions, and (ii) enhancing the bodily reserves, as determined by screening tests".*
>
> Lester Breslow, Dean, School of Public Health, University
> of California at Los Angeles -- in Breslow **[4].**

Social epidemiologists also work with measures of psychological ill-being and well-being, like GHQ scores, as the dependent variable in a regression equation. I had a hand in the estimation of an early British Household Panel Survey regression equation with GHQ as a dependent variable. It showed patterns we still believe about 'happiness equations'.**[5]** Well-being was found to be U-shaped in age; well-being was much higher among married people than the unmarried; it was much lower among the unemployed than the employed; and so on. But the paper, arguably like that of Ballas and Dorling, did not establish causality.

I suspect both the happiness literature and social epidemiology should try to do better on cause-and-effect testing. How?

First, although it is not a perfect fix, the relentless harnessing of longitudinal data is a valuable step. In social epidemiology, it seems crucial to design a truly longitudinal test of the ideas in the famous Whitehall Studies. Presumably we must measure the health of people <u>before</u> they are promoted and then measure their health in the years afterwards. After that, we can calculate the

so-called difference in differences. Did the promoted people go on to have better health than they had before their elevation in status when compared to a control group of like-for-like individuals, whom we also measured early on, who did not get the coveted promotion? The happiness literature has tried to apply such methods on, for example, questions like: comparing two years before to two years afterwards, do people become happier by divorcing? **[6].** Economists tend to believe in <u>fixed-effects</u> equations. They say: show me not the level of Y correlated with the level of X, but the change in Y correlated with the change in X.

Second, we can apply two-stage least squares regression equations (as described in any econometrics textbook). These use an instrumental variable, which is a shift variable -- think of a demand curve cutting a supply curve, where all we see is a cloud of dots and we want to know which curve is which -- that moves one equation and leaves the other equation unchanged.

Third, we can use natural experiments. For instance, economists have tried to solve the problem of the endogeneity of education in a wage equation by examining cohorts educated just before and just after the raising of Britain's school leaving age. Stevenson and Wolfers **[7]** have done something related on the important question: what are the effects of divorce? They trace changes in divorce laws in different states of the USA and correlate those changes with later alterations in variables like female suicide rates. Another 'experiment' can be gleaned from lottery winners. **[8]** Here, on the intellectually important question of whether money buys happiness, it is possible to use longitudinal information on lottery wins to find out whether well-being is increased (yes, GHQ scores improve). How we do this for all our variables of interest -- consider the potentially

two-way relationship between friendship and happiness **[9]** and obesity and unhappiness **[10]** -- remains unknown.

Fourth, we can do laboratory, and so-called field, experiments. This is what perhaps one third of PhD students in top US universities currently do.

Fifth, propensity-score matching methods are becoming popular.

Every scholarly discipline has a strong trace of arrogance and (wrongly) thinks that it, and not those in the other corridors, has the right and mature approach to causal inference. I have come to think that more humility would serve us well. An admirable feature of the Ballas-Dorling work is that it links happiness data to data on people's recalled life events. Even so, just because I have had an event like marriage, or a good friendship, that does not mean it fell upon me exogenously. There remains conceptual work for all of us -- I am as guilty as others -- to do in designing persuasive evidence of causality in social epidemiology and economics.

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