

Debate

NOT ALL AGGREGATE-LEVEL
CORRELATIONS APPROACH UNITY: A REPLY
TO WILLIAM LICHTEN

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Unquestionably, aggregate-level correlations are in most cases higher than individual-level correlations. For example, in the National Longitudinal Survey of Youth (NLSY) in the United States, the correlations are 0.487 between adolescent IQ and log-transformed adult income, 0.449 between years of schooling and adult income and 0.626 between years of schooling and IQ ($N=6064$). The corresponding country-level correlations are 0.815, 0.816 and 0.788 ($N=125$ countries).

However, aggregate-level correlations are expected to approach unity only when aggregate-level and individual-level correlations have the same causes, acting at the individual level. This implies that individual-level correlations are the same or nearly the same in each of the aggregate units. More importantly, relative to causal influences acting at the individual level, those acting on one of the correlated variables in some but not others of the aggregate units must either be small, or highly correlated with the other variable. This is not the case in most aggregated data sets (Hammond, 1973; Schwartz, 1994).

For example, in the Detroit school districts analysed by Sexton (1961), parental income, school achievement and IQ are likely to have similar correlations within each district. The exceedingly high correlations at the district level show that inequalities in school quality or other district-level factors that could change school achievement or IQ are either small or are highly correlated with parental income. In all likelihood district-level correlations would no longer approach unity if the Detroit sample were augmented by school districts from Madras, Ibadan and Osaka.

The reason why country-level correlations almost never approach unity is that causal influences at the country level are ubiquitous. For example, the presence of marketable oil and gas resources is uncorrelated with IQ but raises GDP. In consequence it reduces the country-level correlation between IQ and GDP.

The high individual-level correlation between school achievement and IQ (0.4 to 0.7) is most likely caused by shared brain mechanisms for learning and reasoning. The even higher country-level correlation of 0.92 shows that causal factors acting selectively on school achievement or IQ at the country level are either highly

correlated with country-level differences in the brain mechanisms of learning and reasoning, or are weak. The former seems to be the case for effects of the school system, and the latter for various 'cultural' influences.

References

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