The claims in this study depend on specific patterns of significant and non-significant results across a variety of measures and comparisons. The observed empirical perfection in producing these patterns is extremely unlikely given the inherent variability that should be present due to random sampling. The probability of selecting a random sample that produces the necessary results can be estimated by supposing that the reported sample statistics reflect the population values. The probabilities of the reported patterns for the four experimental studies are: 0.32, 0.76, 0.45, and 0.37. The probability of all four such studies producing the necessary pattern is the product of these values, 0.04.

The findings from the field studies also produced successful patterns, so the probability for all six experiments must be lower than 0.04. The description of the first field study does not provide enough detail to estimate the probability of success, but it must be less than 1.0. For the second field study, the probability of a significant result is estimated to be 0.53. Thus, the probability of successful outcomes for all six experiments is no larger than 0.02.

The reported findings seem too good to be true. Given the size of the reported effects and the sample sizes, it is not believable that experiments with random samples would all match the desired significance patterns. It could be that additional experiments that did not support the theoretical claims were not reported, that the reported experiments were run improperly, or that the theoretical claims were over-fit to both the signal and noise in the data. Regardless of the details, the empirical findings in should not be interpreted as proper scientific evidence for the proposed relationship between poverty and cognitive function.

Details of the power analysis can be downloaded from
http://www1.psych.purdue.edu/~gfrancis/Publications/SciencePoverty/