## Using Statistical Evidence to Prove Causation

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Whenever a litigant needs to prove that a certain result was caused in a specific way, what could be better than citing the infinitesimal probability of that result emanating from an alternative cause? When Sally Clark was put on trial in England for the murder of her two babies, the prosecution called upon Professor Roy Meadow, an eminent British pediatrician, who testified that the probability of two cases of Sudden Infant Death Syndrome (SIDS, or 'cot death') in a family similar to Clark's was just 1 in 73 million. The prosecution attempted to use this probability to support the claim that the cause of death in both cases was their mother's actions.

This Article argues that the contention that a result is due to a certain cause (call it C) should remain unaffected by statistical evidence of the extremely low probability of an *alternative* cause (C*). Based on theories of contrastive causation from the philosophy of science, it explains why inferring that a given outcome was the result of a certain cause, C, from the frequency of C's occurrence requires contrasting this frequency, at least implicitly, with the frequency of the result emanating from a different potential cause, C*.

The Article contends that contrasting frequencies in this manner is objectionable in criminal law, as a matter of principle. It discusses the question of whether the defendant's culpability may be established by using statistical evidence on crime incidence in a population similar to theirs. For example, should the prosecution be allowed to submit the frequency of illegal arms-carrying in a certain neighborhood to support the conviction of an individual resident for holding a firearm illegally? Based on a general theory that I have developed elsewhere, the use of probabilistic generalisations in legal fact-finding is connected to the issue of free will. On the one hand, using some types of generalisation presupposes that the individual's conduct was determined by certain causal factors that rendered their conduct unfree. On the other hand, in criminal trials, it is necessary to presuppose the exact opposite, namely that the accused was free to determine their own conduct. If the court admits such statistical evidence, it accepts the relevance of this evidence to proving the defendant's conduct, thereby implicitly conceding the presupposition that the defendant did not act freely. In such a scenario, the court should concede the logical implications of this presupposition, namely that the defendant is not culpable and should therefore be released. Alternatively, if the court seeks to avoid the implications of deeming this generalisation probative, it ought to reject the statistical evidence adduced to substantiate it.

When both parts of the argument are combined, the following conclusion emerges: if one piece of statistical evidence (on the low probability of a natural cause) is not probative unless contrasted with another piece of statistical evidence (on the frequency of the criminal activity among people who are similar to the accused), and if the latter is inadmissible (because its use is objectionable as a matter of principle), then both pieces of statistical evidence should be inadmissible. It follows that using statistical evidence on the low probability of an alternative cause is objectionable, regardless of how reliable the statistical analysis is.