



e-quilibrium

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Regression

Suppose the parent of a third grader praises the child after an exceptionally strong score on a spelling test, and the child does more poorly on the subsequent test. On another occasion, the same parent punishes the child after an exceptionally poor performance on a spelling test, and the child does better on the subsequent test. What should the parent conclude about the effectiveness of praise and punishment?

Now imagine that same parent takes the child to the doctor when the child's cold symptoms are at their worst. Although the doctor believes the illness is a virus, at the parent's insistence, the doctor reluctantly prescribes an antibiotic. Subsequently, the child gets better. What is the parent likely to believe about the effectiveness of the antibiotic, and is this belief accurate?

When a major league baseball player wins the "rookie of the year" award, it is not uncommon for that player's performance in the second season to be worse than the rookie year. Is this player a victim of the "sophomore slump," the dreaded curse associated with being named rookie of the year?

"Regression to the mean" is one of the most basic statistical principles. When the occurrence or value of some variable is extreme, simply by chance (statistical probability) it will be closer to average (the mean) on a subsequent occurrence. Whether good or bad, an unusual outcome is likely to be followed by a more typical outcome.

Failure to appreciate the principal of regression to the mean is a strong contributor to illusory correlation, that is, the belief that two things are somehow linked when in fact there is no relationship. Flawed assumptions or superstitions are more prone to develop with exceptional occurrences. Such occurrences grab our attention and we look for factors that we think might be related to the unusual deviation from the norm, and the subsequent return to the typical.

Persons in helping or health professions can become overconfident about their effectiveness when failing to remember the principle of regression to the mean. Patients/clients typically seek treatment when their symptoms are bad, and many conditions will naturally get better even in the absence of treatment. In such cases, the provider of treatment may assume that the services rendered were responsible for the improvement, when it may be that the improvement would have occurred naturally without treatment. Remembering this principle can help keep me humble about my own effectiveness as a therapist.

Now let's return to the examples at the beginning of this column. Based upon the information given regarding the parent and the third grader, there is nothing to conclude about the effectiveness of praise and punishment because a more typical performance is likely to follow an exceptional performance, whether or not there is praise or punishment. The child's cold is likely to improve without antibiotics, but illusory correlation has contributed to inappropriate requests for and overuse of antibiotics. It is very difficult for a rookie of the year or a most valuable player to improve upon their performance in a subsequent year, since their recognition occurred because of exceptional performances.

When an occurrence is unusually good or bad, it generally is a safe bet to predict that the subsequent outcome will be closer to the norm. Remembering the principle of regression to the mean can help us avoid erroneous conclusions about factors responsible for improvement or decline in such situations.

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