

Accident probability after accident occurrence

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Abstract

This research paper deals with the question of how the probability of having a traffic accident changes when one previous accident has already occurred. This is a follow-up study upon the earlier hypothesis of “accident proneness” launched by Greenwood and Yule in the 1920s. It is based on data gathered during 8 years in the public bus company of a large Spanish city and examines the implications in the magnitude of intervals between accidents. Data analysis shows evidences of several clear-cut and stable trends towards clusters of two, three and more accidents structured around short intervals. This feature, considered a tendency, seems to be stable throughout the time and independent of densities among accidents.

The focus of analysis has been (1) the comparison of the observed distribution versus the distribution by chance of intervals between consecutive accidents; (2) the estimate and comparison of both theoretical and empirical probabilities of having two consecutive accidents, considering the interval by days elapsed; (3) the estimate of empirical and theoretical cumulated probabilities of having two consecutive accidents separated by a maximum number of days, showing up the differences of these probabilities.

Results obtained are highly significant and the three hypotheses are confirmed. There seem to be two different driving styles, related to the accumulation versus the non-accumulation of accidents in short intervals.

The main contribution of this paper is the concept of “grouped accident proneness” evidenced through the analysis of data. The influence of some psychological dimensions is suggested.

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