TRANSFORMATION OF SURVIVAL DATA

Richard A. Johnson

University of Wisconsin

1. Introduction

It is good statistical practice to perform more than one analysis on a given data set. Normal theory methods usually provide one alternative. By employing transformations their domain of application can be greatly extended. Under normal theory, we have the advantage of simple interpretations of linear regression and interactions. Coupled with the relative ease of computation and availability of diagnostic techniques, for complete samples, normal theory has much to recommend it. Except for computational ease, the other advantages are retained in the survival analysis setting.

By transforming survival data, and then applying parametric estimation methods, we obtain an estimated survival curve which may be compared to the Kaplan-Meier (1958) estimate. In a regression setting comparisons could be made with the analysis based on the Cox (1972) proportional hazards model, or the methods of Miller (1976), Buckley and James (1979) and Koul, Susarla and Van Ryzin (1981).

2. Background and Notation

We briefly review the literature that pertains to our extensions. Box and Cox (1964) suggest the family of transformations