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An Indirect Rank-Minimization Algorithm

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Since Thurstone's work in the 1930s, researchers have sought an algorithm that would choose the unique variances to minimize the rank of the reduced correlation matrix in the population and thereby discover the number of factors, which is equal to the minimum rank. This paper derives an algorithm to do so indirectly, uses simulations to demonstrate that it is successful both in the population and in reasonably-sized samples, and illustrates its use with an empirical example. Some comparisons are made to other factor analysis estimators that specify the number of factors in advance.