Abstract: This paper extends the work by Rao [6] concerning factor analysis criteria equivalent to the principal component analysis of a finite set of random variables. We search for global (i.e. non-iterative) criteria for the factor analysis of a probability defined on a separable Hilbert space or of a real random function other than a finite or countable set of real random variables. We compare this analysis with principal component analysis defined in a general probabilistic setting by Dauxois and Pousse [2].

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