Notation for likelihood and related quantities

The notation below will assume that we have a random vector $Y = (Y_1, \ldots, Y_n)$, where $Y_1, \ldots, Y_n$ are independent, identically distributed, from a density function $f(y;\theta)$ where $\theta \in R^p$. Extensions to the non identically distributed or non independent case will be made later as needed.

likelihood function	$L(\theta) = L(\theta; y) = \prod_1^n f(y_i;\theta)$
log-likelihood function	$\ell(\theta) = \ell(\theta; y) = \sum \log f(y_i;\theta)$
maximum likelihood estimate	$\hat\theta = \hat\theta(y) = \arg\sup_\theta L(\theta)$
score function	$U(\theta) = \ell'(\theta) = \sum U_i(\theta)$
observed information function	$j(\theta) = \frac{1}{n}\{-\ell''(\theta)\}$
observed (Fisher) information	$j(\hat\theta)$
expected (Fisher) information	$i(\theta) = \frac{1}{n} var_\theta\{U(\theta)\}$
standardized score statistic	$\frac{1}{\sqrt{n}}U(\theta)\{j(\hat\theta)\}^{-1/2}$
standardized Wald statistic	$\sqrt{n}(\hat\theta - \theta)\{j(\hat\theta)\}^{1/2}$
likelihood ratio statistic	$w(\theta) = 2\{\ell(\hat\theta) - \ell(\theta)\}$
likelihood root ($p = 1$)	$r(\theta) = \pm\sqrt{w(\theta)}$

When necessary, the random nature of likelihood quantities will be made explicit by writing, for example, $L(\theta; Y)$, $\ell(\theta; Y)$, $\hat\theta(Y)$.