# Beta prior for correlation parameters: betacorrelation

This is a prior for the correlation parameter $\rho \in (-1, 1)$ which is internally represented as

$$\theta = \log \frac{\rho + 1}{\rho - 1}$$

## Parametrization

The prior defined on $\theta$ so that the correlation parameter $\rho$ has a Beta$(a, b)$ distribution scaled to have domain in $(-1, 1)$:

$$\pi(\rho|a, b) = 0.5 \, \frac{\Gamma(a + b)}{\Gamma(a)\Gamma(b)} \rho^{a-1}(1 - \rho)^{b-1}$$

## Specification

The Beta prior for the correlation is specified in the `hyper` argument as follows:

```
hyper = list(<theta> = list(prior = "betacorrelation", param=c(<a>,<b>)))
```

## Example

## Notes

The prior is internally defined on the $\theta$ parameter therefore initial values have to be provided in the $\theta$-scale. For example if the desired initial value is $\rho = 0.5$, which means $\theta = \log(1/3) = -1.098$ the following specification has to be provided:

```
hyper = list(<theta> = list(prior = "betacorrelation",
          param=c(<a>,<b>),initial=-1.098))
```