

Z is the log-transformed bivariate response
 x[i,1] is a sequence indicator
 x[i,2] is a period indicator
 x[i,3] is a treatment indicator
 s[g[i]] corresponds to the random subject effect
 g[i] is a variable indicator of the subject effect

Model

```
{
  for (i in 1:N) {
    z[i,1:2]~dmnorm(mu[i,1:2],tau1[1:2,1:2])
    mu[i,1]<-beta1[1]*x1[i,1]+beta1[2]*x1[i,2]+alpha[1]*x1[i,3]+s[g[i],1]
    mu[i,2]<-beta2[1]*x2[i,1]+beta2[2]*x2[i,2]+alpha[2]*x2[i,3]+s[g[i],2]
  }
}
```

distribution of the random effects

```
for ( k in 1:p) {
  s[i,1:2]~dmnorm(mu0[],tau3[,])
}
```

```
for ( k in 1:2) {
  mu0[k]~dnorm(0,0.001)
  beta1[k]~dnorm(0,0.001)
  beta2[k]~dnorm(0,0.001)
}
```

correlated Prior distribution on the treatment effect

```
alpha[1:2]~dmnorm(betamu1[],Sigma1[1:2,1:2])
```

```
Sigma1[1:2,1:2]<-inverse(omega[,])
```

```
tau1[1:2,1:2]~dwish( RT1[,], 2 )
```

```
tau3[1:2,1:2]~dwish( RT3[,], 2 )
```

```
omega1[1:2,1:2]<-inverse(tau1[,])
```

```
omega3[1:2,1:2]<-inverse(tau3[,])
```

```
omega[1,1]<-S2BR
omega[2,2]<-S2BT
omega[1,2]<-rho*sqrt(S2BT*S2BR)
omega[2,1]<-omega[1,2]
```

```
S2BR<-1/TAUBR
S2BT<-1/TAUBT
TAUBR<-0.055
TAUBT<-0.055
rho~dunif(0,1)
```

```
RT1[1,1]<-1
RT1[1,2]<-0
RT1[2,1]<-0
RT1[2,2]<-1
```

```
RT3[1,1]<-1
RT3[1,2]<-0
RT3[2,1]<-0
RT3[2,2]<-1
```

```
# ABE criteria
```

```
abe1<-2*alpha[1]
abe2<-2*alpha[2]
```

```
#posterior probability of criteria
```

```
PAB1<-step(abe1-log(0.8))-step(abe1-log(1.25))
```

```
PAB2<-step(abe2-log(0.8))-step(abe2-log(1.25))
```

```
# joint posterior probability
```

```
PAB<-PAB1*PAB2
```

```
}
```

Data

```
list(N=36,p=18,  
x1=structure(.Data=c(  
0,0,0,  
0,0,0,  
....  
....  
),  
.Dim=c(36,3)),  
  
x2=structure(.Data=c(  
0,0,0,  
0,0,0,  
....  
....  
),  
.Dim=c(36,3)),  
z=structure(.Data=c(  
2.52,1.04,  
8.87,3.80,  
...  
...  
),.Dim=c(36,2)))
```