

```

model{
  for(p in 1:N){
    for(i in 1:nit){

      logit(p.slow[p,i]) <- a.slow[i]*theta[p] - b.slow[i] #Eq. 3

      logit(p.fast[p,i]) <- a.fast[i]*theta[p] - b.fast[i] #Eq. 4

      mu.rt[p,i]<- icept[i] - speed[p] #Expected value of Eq. 1

      lrt[p,i]~dnorm(mu.rt[p,i],prec[i]) #Follows from Eq. 1

      res[p,i]<-lrt[p,i]- mu.rt[p,i]

      logit(pi[p,i])<- time*(res[p,i] * sqrt(prec[i])-marg) #Eq. 5 with  $\text{prec}[i] = \sigma_{\epsilon i}^{-2}$ 

      prob[p,i] <- pi[p,i]*p.slow[p,i]+(1-pi[p,i])*p.fast[p,i] #Eq. 2

      x[p,i]~dbern(prob[p,i])

    }
  }

  for(p in 1:N){

    theta[p]~dnorm(0,1) # prior on  $\theta$ 

    mu.s[p]<-cor*theta[p]

    speed[p]~dnorm(mu.s[p],prec.s) # prior on  $\tau$  with  $\text{prec.s} = \sigma_{\tau}^{'-2}$ 

  }

  for(i in 1: nit){ # prior on  $\eta_i$ 

    item.par[i,1:6]~dmnorm(item.mu[],item.prec[,])

    a.fast[i]<-exp(item.par[i,1]) #  $\alpha_{0i}$ 

    a.slow[i]<-exp(item.par[i,2]) #  $\alpha_{1i}$ 

    b.fast[i]<-item.par[i,3] #  $\beta_{0i}$ 

    b.slow[i]<-item.par[i,4] #  $\beta_{1i}$ 

    icept[i]<-item.par[i,5] #  $\lambda_i$ 
  }
}

```

prec[i]<-1/exp(item.par[i,6])	# $\sigma_{\epsilon i}^{-2}$
}	
Intime~dnorm(0,.1)	#prior on $\ln(\zeta_1)$
time<-exp(Intime)	# ζ_1
marg~dnorm(0,.1)	#prior on ζ_0
item.mu[1:6]~dmnorm(zeros[],item.prec[,])	# hyperprior on μ_η
item.prec[1:6,1:6]~dwish(R[,],6)	# hyperprior on Σ_η^{-2}
sigma2.s.tilde<-1/prec.s	
sigma2.s<-sigma2.s.tilde+cor*cor	# $\sigma_\tau^{-2} = \sigma_\tau'^{-2} + \sigma_{\theta\tau}^{-2}$
cor~dnorm(0,.1)	# hyperprior on $\sigma_{\theta\tau}$
prec.s~dgamma(.1,.1)	# hyperprior on $\sigma_\tau'^{-2}$
}	