APPENDIX 3: WINBUGS CODE FOR THE MODEL WITH T-DISTRIBUTED STUDY-SPECIFIC MEANS

Parameters:

- x: observed effect sizes
- s: the corresponding standard deviations
- N: number of observed effect sizes
- mu: mean effect size
- alpha: study-specific means
- v1, v2: parameters of the weight function
- bs_sd: the square root of the between-study variance
- df: number of degrees of freedom of the distribution of the study-specific means

The model for RR=P(including statistically significant positive outcomes)/P(including other outcomes):

```winbugs
model {
  C <- 10000 ## this just has to be large enough to ensure all ph[i]'s > 0
  for(i in 1:N) {
    xs[i]<-step(x[i]/s[i]-1.96)
    q_std[i]<-(1.96*s[i]-alpha[i])/s[i]
    CDFq[i]<-phi(q_std[i])
    minl[i]<- -log(xs[i]*v1+(1-xs[i])*v2)+0.5*pow((x[i]-alpha[i])/s[i],2)+log(v1*(1-CDFq[i])+v2*CDFq[i])) ## -log likelihood

    ## the zero's trick, see: Winbugs help
    zeros[i]<-0
    zeros[i]~dpois(ph[i])
    ph[i]<-minl[i]+C

    alpha[i]~dt(mu,bs_prec,df)
  }
  RR<-v1/v2

  ## priors
  mu~dnorm(0,0.000001)
  bs_sd~dunif(0,10)
  bs_var<bs_sd*bs_sd
  bs_prec<1/bs_var
  v1~dunif(0,1)
  v2~dunif(0,1)
  df~dunif(2,100)
}
```
The model for $RR = P(\text{including statistically significant negative outcomes}) / P(\text{including other outcomes})$:

```r
model
{
  C <- 10000 ## this just has to be large enough to ensure all ph[i]'s > 0
  for(i in 1:N)
  {
    xns[i] <- 1-step(x[i]/s[i]+1.96)
    q_std[i] <- (-1.96*s[i]-alpha[i])/s[i]
    CDFq[i] <- phi(q_std[i])
    minl[i] <- -log(xns[i]*v1+(1-xns[i])*v2)+0.5*pow((x[i]-alpha[i])/s[i],2)+log(v1*CDFq[i]+v2*(1-CDFq[i])) ## -log likelihood

    ## the zero's trick, see: Winbugs help
    zeros[i] <- 0
    zeros[i] ~ dpois(ph[i])
    ph[i] <- minl[i] + C
  }

  RR <- v1/v2
}

## priors
mu ~ dnorm(0,0.000001)
bs_sd ~ dunif(0,10)
bs_var <- bs_sd*bs_sd
bs_prec <- 1/bs_var
v1 ~ dunif(0,1)
v2 ~ dunif(0,1)
dF ~ dunif(2,100)
}
```

The model for $RR = P(\text{including statistically significant outcomes}) / P(\text{including other outcomes})$:

```r
model
{
  C <- 10000 ## this just has to be large enough to ensure all ph[i]'s > 0
  for(i in 1:N)
  {
    xs[i] <- step(abs(x[i]/s[i])-1.96)
    CDF[i] <- phi((-1.96*s[i]-alpha[i])/s[i])+1-phi((1.96*s[i]-alpha[i])/s[i])
    minl[i] <- -log(xs[i]*v1+(1-xs[i])*v2)+0.5*pow((x[i]-alpha[i])/s[i],2)+log(v1*CDF[i]+v2*(1-CDF[i])) ## -log likelihood

    ## the zero's trick, see: Winbugs help
    zeros[i] <- 0
    zeros[i] ~ dpois(ph[i])
    ph[i] <- minl[i] + C
  }
```

```
\[ \alpha[i] \sim \text{dt}(\mu, \text{bs\_prec}, \text{df}) \]

\[
\text{RR} \leftarrow \frac{v_1}{v_2}
\]

## priors
\[
\mu \sim \text{dnorm}(0, 0.000001)
\]
\[
\text{bs\_sd} \sim \text{dunif}(0, 10)
\]
\[
\text{bs\_var} < \text{bs\_sd}^2 \text{bs\_sd}
\]
\[
\text{bs\_prec} < \frac{1}{\text{bs\_var}}
\]
\[
v_1 \sim \text{dunif}(0, 1)
\]
\[
v_2 \sim \text{dunif}(0, 1)
\]
\[
\text{df} \sim \text{dunif}(2, 100)
\]