The results below are generated from an R script.

```
// original code for HMNL from J Yapp
//https://discourse.mc-stan.org/t/speeding-up-a-hierarchical-multinomial-logit-model/1538/5
data {
  int<lower=2> C; // Number of alternatives (choices) in each scenario
  int<lower=1> K; // Number of alternatives
  int<lower=1> R; // Number of respondents
  int<lower=1> S; // Number of scenarios per respondent
  int<lower=1,upper=C> YB[R, S]; // best choices
  int<lower=1,upper=C> YW[R, S]; // worst choices
  matrix[C, K] X[R, S]; // matrix of attributes for each obs
}

parameters {
  vector[K] Beta[R];
  vector[K - 1] Theta_raw;
  cholesky_factor_corr[K] L_Omega;
  vector<lower=0, upper=pi()/2>[K] L_sigma_unif;
}

transformed parameters {
  vector<lower=0>[K] L_sigma;
  matrix[K, K] L_Sigma;
  vector[C] XB[R, S];
  vector[K] Theta;

  for (k in 1:K) {
    L_sigma[k] = 2.5 * tan(L_sigma_unif[k]);
  }

  L_Sigma = diag_pre_multiply(L_sigma, L_Omega);

  Theta[1] = 0;
  for (k in 1:(K-1)) {
    Theta[k + 1] = Theta_raw[k];
  }

  for (r in 1:R) {
    for (s in 1:S) {
      XB[r,s] = X[r,s] * Beta[r];
    }
  }
}

model {
  //priors
  Theta_raw ~ normal(0, 10);
  L_Omega ~ lkj_corr_cholesky(4);

  //likelihood
  Beta ~ multi_normal_cholesky(Theta, L_Sigma);
  for (r in 1:R) {
    for (s in 1:S) {
```

```
      YB[r,s] ~ categorical_logit(XB[r,s]);
      YW[r,s] ~ categorical_logit(-XB[r,s]);
    }
  }
}
}

## Error:  <text>:1:1:  unexpected '/'
## 1:  /
##     ^
```

The R session information (including the OS info, R version and all packages used):

```
sessionInfo()

## R version 3.5.2 (2018-12-20)
## Platform: x86_64-apple-darwin15.6.0 (64-bit)
## Running under: macOS Mojave 10.14.5
##
## Matrix products: default
## BLAS: /System/Library/Frameworks/Accelerate.framework/Versions/A/Frameworks/vecLib.framework/Versions
## LAPACK: /Library/Frameworks/R.framework/Versions/3.5/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_CA.UTF-8/en_CA.UTF-8/en_CA.UTF-8/C/en_CA.UTF-8/en_CA.UTF-8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] usethis_1.5.0
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_1.0.1         highr_0.8          compiler_3.5.2     pillar_1.3.1
##  [5] plyr_1.8.4         prettyunits_1.0.2  tools_3.5.2        packrat_0.5.0
##  [9] pkgbuild_1.0.3     evaluate_0.13      tibble_2.1.1       gtable_0.3.0
## [13] pkgconfig_2.0.2    rlang_0.3.4        cli_1.1.0          rstudioapi_0.10
## [17] parallel_3.5.2     xfun_0.6           loo_2.1.0          gridExtra_2.3
## [21] stringr_1.4.0      knitr_1.22         dplyr_0.8.0.1      fs_1.2.7
## [25] stats4_3.5.2       grid_3.5.2         tidyselect_0.2.5   glue_1.3.1
## [29] inline_0.3.15      R6_2.4.0           processx_3.3.0     rstan_2.18.2
## [33] ggplot2_3.1.1      callr_3.2.0        purrr_0.3.2        magrittr_1.5
## [37] scales_1.0.0       ps_1.3.0           StanHeaders_2.18.1 matrixStats_0.54.0
## [41] assertthat_0.2.1   colorspace_1.4-1   stringi_1.4.3      lazyeval_0.2.2
## [45] munsell_0.5.0      crayon_1.3.4

Sys.time()

## [1] "2019-07-22 14:03:07 MDT"
```