StatisticalRethinkingChapter12

Denis Kozhokar

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library(rethinking)

## Loading required package: rstan

## Loading required package: ggplot2

## Loading required package: StanHeaders

## rstan (Version 2.17.3, GitRev: 2e1f913d3ca3)

## For execution on a local, multicore CPU with excess RAM we recommend calling  
## options(mc.cores = parallel::detectCores()).  
## To avoid recompilation of unchanged Stan programs, we recommend calling  
## rstan\_options(auto\_write = TRUE)

## Loading required package: parallel

## rethinking (Version 1.59)

library(rstan)

# 12E1. Which of the following priors will produce more shrinkage in the estimates?

1. αtank ∼ Normal(0, 1)

# 12E2. Make the following model into a multilevel model.

yi ∼ Binomial(1, pi) logit(pi) = αgroup[i] + βxi αgroup ∼ Normal(0, 10) β ∼ Normal(0, 1)

Q12.E2 <- map2stan( alist( yi ~ dbinom( density , p ) , logit(p) <- alpha[i] + beta , alpha[i] ~ dnorm( 0,10 ) , beta ~ dnorm(0,1) ), data=d , iter=4000 , chains=4 )

# 12E3. Make the following model into a multilevel model.

yi ∼ Normal(μi, σ) μi = αgroup[i] + βxi αgroup ∼ Normal(0, 10) β ∼ Normal(0, 1) σ ∼ HalfCauchy(0, 2)

Q12.E3 <- map2stan( alist( yi ~ dbinom( density , p ) , logit(p) <- alpha[i] + beta , alpha[i] ~ dnorm( 0 , 10 ) , sigma ~ dcauchy(0,1), beta ~ dnorm(0,1) ), data=d , iter=4000 , chains=4 )

# 12E4. Write an example mathematical model formula for a Poisson regression with varying intercepts.

Ti ∼ Poisson(μi) log(μi) = α[i] αi ∼ Normal(α, σ) α ∼ Normal(0, 1) σ∼ HalfCauchy(0, 1)

# 12E5. Write an example mathematical model formula for a Poisson regression with two different kinds of varying intercepts, a cross-classified model.

Ti ∼ Poisson(μi) log(μi) = α + αactor[i] + αblock[i] + (βP + βPCCi)Pi αactor ∼ Normal(0, σactor) αblock ∼ Normal(0, σblock) α ∼ Normal(0, 10) βP ∼ Normal(0, 10) βPC ∼ Normal(0, 10) σactor ∼ HalfCauchy(0, 1) σblock ∼ HalfCauchy(0, 1)

# 12M1. Revisit the Reed frog survival data, data(reedfrogs), and add the predation and size treatment variables to the varying intercepts model. Consider models with either main effect alone, both main effects, as well as a model including both and their interaction. Instead of focusing on inferences about these two predictor variables, focus on the inferred variation across tanks. Explain why it changes as it does across models.

data(reedfrogs)  
d <- reedfrogs  
str(d)

## 'data.frame': 48 obs. of 5 variables:  
## $ density : int 10 10 10 10 10 10 10 10 10 10 ...  
## $ pred : Factor w/ 2 levels "no","pred": 1 1 1 1 1 1 1 1 2 2 ...  
## $ size : Factor w/ 2 levels "big","small": 1 1 1 1 2 2 2 2 1 1 ...  
## $ surv : int 9 10 7 10 9 9 10 9 4 9 ...  
## $ propsurv: num 0.9 1 0.7 1 0.9 0.9 1 0.9 0.4 0.9 ...

# make the tank cluster variable  
d$tank <- 1:nrow(d)  
d$pred <- ifelse(test = d$pred == "pred", yes = 1, no = 0)  
d$frogsize <- ifelse(test = d$size == "big", yes = 1, no = 0)  
  
# fit several models  
Q12M1\_pred <- map2stan(  
 alist(  
 surv ~ dbinom(density, p) ,  
 logit(p) <- alpha[tank] + beta\_pred\*pred,  
 alpha[tank] ~ dnorm(a, sigma),  
 a ~ dnorm(0, 10),  
 sigma ~ dcauchy(0, 1),  
 beta\_pred ~ dnorm(0, 1)  
 ), data=d )

## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af214718227.cpp:8:  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## ^  
## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af214718227.cpp:564:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af214718227.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.  
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 2.8e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.28 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## Iteration: 1 / 2000 [ 0%] (Warmup)  
## Iteration: 200 / 2000 [ 10%] (Warmup)  
## Iteration: 400 / 2000 [ 20%] (Warmup)  
## Iteration: 600 / 2000 [ 30%] (Warmup)  
## Iteration: 800 / 2000 [ 40%] (Warmup)  
## Iteration: 1000 / 2000 [ 50%] (Warmup)  
## Iteration: 1001 / 2000 [ 50%] (Sampling)  
## Iteration: 1200 / 2000 [ 60%] (Sampling)  
## Iteration: 1400 / 2000 [ 70%] (Sampling)  
## Iteration: 1600 / 2000 [ 80%] (Sampling)  
## Iteration: 1800 / 2000 [ 90%] (Sampling)  
## Iteration: 2000 / 2000 [100%] (Sampling)  
##   
## Elapsed Time: 0.253008 seconds (Warm-up)  
## 0.22119 seconds (Sampling)  
## 0.474198 seconds (Total)  
##   
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 1.8e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.18 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 1e-06 seconds (Warm-up)  
## 6.6e-05 seconds (Sampling)  
## 6.7e-05 seconds (Total)

## Warning: There were 1 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup

## Warning: Examine the pairs() plot to diagnose sampling problems

## Computing WAIC

## Constructing posterior predictions

## [ 100 / 1000 ]  
[ 200 / 1000 ]  
[ 300 / 1000 ]  
[ 400 / 1000 ]  
[ 500 / 1000 ]  
[ 600 / 1000 ]  
[ 700 / 1000 ]  
[ 800 / 1000 ]  
[ 900 / 1000 ]  
[ 1000 / 1000 ]

## Aggregated binomial counts detected. Splitting to 0/1 outcome for WAIC calculation.

Q12M1\_size <- map2stan(  
 alist(  
 surv ~ dbinom(density, p) ,  
 logit(p) <- alpha[tank] + beta\_frogsize\*frogsize,  
 alpha[tank] ~ dnorm(a, sigma),  
 a ~ dnorm(0, 10),  
 sigma ~ dcauchy(0, 1),  
 beta\_frogsize ~ dnorm(0, 1)  
 ), data=d )

## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:2:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/QR:17:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Eigenvalues:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/operator\_unary\_plus.hpp:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/scal/fun/constants.hpp:4:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/constants/constants.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:27:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af276e6d133.cpp:564:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af276e6d133.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.  
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 2.5e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.25 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## Iteration: 1 / 2000 [ 0%] (Warmup)  
## Iteration: 200 / 2000 [ 10%] (Warmup)  
## Iteration: 400 / 2000 [ 20%] (Warmup)  
## Iteration: 600 / 2000 [ 30%] (Warmup)  
## Iteration: 800 / 2000 [ 40%] (Warmup)  
## Iteration: 1000 / 2000 [ 50%] (Warmup)  
## Iteration: 1001 / 2000 [ 50%] (Sampling)  
## Iteration: 1200 / 2000 [ 60%] (Sampling)  
## Iteration: 1400 / 2000 [ 70%] (Sampling)  
## Iteration: 1600 / 2000 [ 80%] (Sampling)  
## Iteration: 1800 / 2000 [ 90%] (Sampling)  
## Iteration: 2000 / 2000 [100%] (Sampling)  
##   
## Elapsed Time: 0.22449 seconds (Warm-up)  
## 0.179783 seconds (Sampling)  
## 0.404273 seconds (Total)  
##   
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 1.4e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.14 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 2e-06 seconds (Warm-up)  
## 6.6e-05 seconds (Sampling)  
## 6.8e-05 seconds (Total)

## Warning: There were 1 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup  
  
## Warning: Examine the pairs() plot to diagnose sampling problems

## Computing WAIC  
## Constructing posterior predictions

## [ 100 / 1000 ]  
[ 200 / 1000 ]  
[ 300 / 1000 ]  
[ 400 / 1000 ]  
[ 500 / 1000 ]  
[ 600 / 1000 ]  
[ 700 / 1000 ]  
[ 800 / 1000 ]  
[ 900 / 1000 ]  
[ 1000 / 1000 ]

## Aggregated binomial counts detected. Splitting to 0/1 outcome for WAIC calculation.

Q12M1\_both <- map2stan(  
 alist(  
 surv ~ dbinom(density, p) ,  
 logit(p) <- alpha[tank] + beta\_pred\*pred + beta\_frogsize\*frogsize,  
 alpha[tank] ~ dnorm(a, sigma),  
 a ~ dnorm(0, 10),  
 sigma ~ dcauchy(0, 1),  
 c(beta\_pred, beta\_frogsize) ~ dnorm(0, 1)  
 ), data=d )

## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:2:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/QR:17:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
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## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
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## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Eigenvalues:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
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## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/operator\_unary\_plus.hpp:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/scal/fun/constants.hpp:4:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/constants/constants.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:27:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27b3b9a8.cpp:612:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af27b3b9a8.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.  
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 2.5e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.25 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## Iteration: 1 / 2000 [ 0%] (Warmup)  
## Iteration: 200 / 2000 [ 10%] (Warmup)  
## Iteration: 400 / 2000 [ 20%] (Warmup)  
## Iteration: 600 / 2000 [ 30%] (Warmup)  
## Iteration: 800 / 2000 [ 40%] (Warmup)  
## Iteration: 1000 / 2000 [ 50%] (Warmup)  
## Iteration: 1001 / 2000 [ 50%] (Sampling)  
## Iteration: 1200 / 2000 [ 60%] (Sampling)  
## Iteration: 1400 / 2000 [ 70%] (Sampling)  
## Iteration: 1600 / 2000 [ 80%] (Sampling)  
## Iteration: 1800 / 2000 [ 90%] (Sampling)  
## Iteration: 2000 / 2000 [100%] (Sampling)  
##   
## Elapsed Time: 0.246819 seconds (Warm-up)  
## 0.198304 seconds (Sampling)  
## 0.445123 seconds (Total)  
##   
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 2e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.2 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 1e-06 seconds (Warm-up)  
## 6.8e-05 seconds (Sampling)  
## 6.9e-05 seconds (Total)

## Warning: There were 1 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup  
  
## Warning: Examine the pairs() plot to diagnose sampling problems

## Computing WAIC  
## Constructing posterior predictions

## [ 100 / 1000 ]  
[ 200 / 1000 ]  
[ 300 / 1000 ]  
[ 400 / 1000 ]  
[ 500 / 1000 ]  
[ 600 / 1000 ]  
[ 700 / 1000 ]  
[ 800 / 1000 ]  
[ 900 / 1000 ]  
[ 1000 / 1000 ]

## Aggregated binomial counts detected. Splitting to 0/1 outcome for WAIC calculation.

Q12M1\_interaction <- map2stan(  
 alist(  
 surv ~ dbinom(density, p) ,  
 logit(p) <- alpha[tank] + beta\_pred\*pred + beta\_frogsize\*frogsize + beta\_pred\_frogsize\*pred\*frogsize,  
 alpha[tank] ~ dnorm(a, sigma),  
 a ~ dnorm(0, 10),  
 sigma ~ dcauchy(0, 1),  
 c(beta\_pred, beta\_frogsize, beta\_pred\_frogsize) ~ dnorm(0, 1)  
 ), data=d )

## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:2:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/QR:17:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Eigenvalues:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/operator\_unary\_plus.hpp:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/scal/fun/constants.hpp:4:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/constants/constants.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:27:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af24c21d573.cpp:647:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af24c21d573.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.  
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 2.8e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.28 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## Iteration: 1 / 2000 [ 0%] (Warmup)  
## Iteration: 200 / 2000 [ 10%] (Warmup)  
## Iteration: 400 / 2000 [ 20%] (Warmup)  
## Iteration: 600 / 2000 [ 30%] (Warmup)  
## Iteration: 800 / 2000 [ 40%] (Warmup)  
## Iteration: 1000 / 2000 [ 50%] (Warmup)  
## Iteration: 1001 / 2000 [ 50%] (Sampling)  
## Iteration: 1200 / 2000 [ 60%] (Sampling)  
## Iteration: 1400 / 2000 [ 70%] (Sampling)  
## Iteration: 1600 / 2000 [ 80%] (Sampling)  
## Iteration: 1800 / 2000 [ 90%] (Sampling)  
## Iteration: 2000 / 2000 [100%] (Sampling)  
##   
## Elapsed Time: 0.30295 seconds (Warm-up)  
## 0.372374 seconds (Sampling)  
## 0.675324 seconds (Total)  
##   
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 1.7e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.17 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 1e-06 seconds (Warm-up)  
## 6.8e-05 seconds (Sampling)  
## 6.9e-05 seconds (Total)

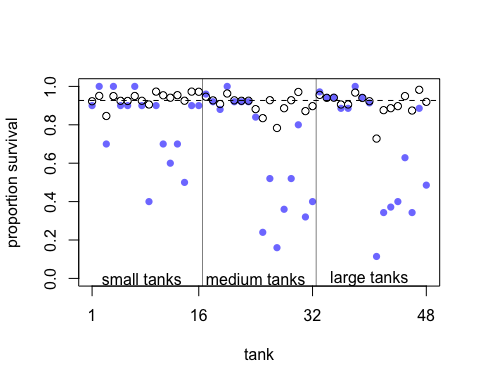
## Warning: There were 1 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup  
  
## Warning: Examine the pairs() plot to diagnose sampling problems

## Computing WAIC  
## Constructing posterior predictions

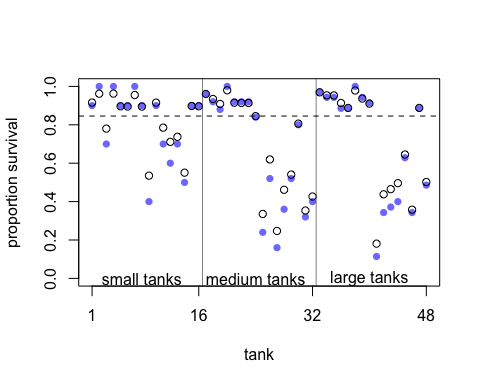
## [ 100 / 1000 ]  
[ 200 / 1000 ]  
[ 300 / 1000 ]  
[ 400 / 1000 ]  
[ 500 / 1000 ]  
[ 600 / 1000 ]  
[ 700 / 1000 ]  
[ 800 / 1000 ]  
[ 900 / 1000 ]  
[ 1000 / 1000 ]

## Aggregated binomial counts detected. Splitting to 0/1 outcome for WAIC calculation.

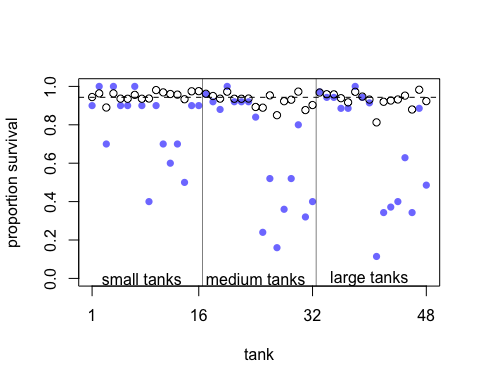
# posterior predictive check  
post\_pred <- function(model, df) {  
 post <- extract.samples(model)  
   
 # compute median intercept for each tank  
 # also transform to probability with logistic  
 df$propsurv\_est <- logistic( apply( X = post$alpha, MARGIN = 2, FUN = median ) )  
   
 # display raw proportions surviving in each tank  
 plot( df$propsurv , ylim=c(0,1) , pch=16 , xaxt="n" ,  
 xlab="tank" , ylab="proportion survival" , col=rangi2 )  
 axis( 1 , at=c(1,16,32,48) , labels=c(1,16,32,48) )  
   
 # overlay posterior medians  
 points( df$propsurv\_est )  
   
 # mark posterior median probability across tanks  
 abline( h=logistic(median(post$alpha)) , lty=2 )  
   
 # draw vertical dividers between tank densities  
 abline( v=16.5 , lwd=0.5 )  
 abline( v=32.5 , lwd=0.5 )  
 text( 8 , 0 , "small tanks" )  
 text( 16+8 , 0 , "medium tanks" )  
 text( 32+8 , 0 , "large tanks" )  
}  
  
post\_pred(model = Q12M1\_pred, df = d)



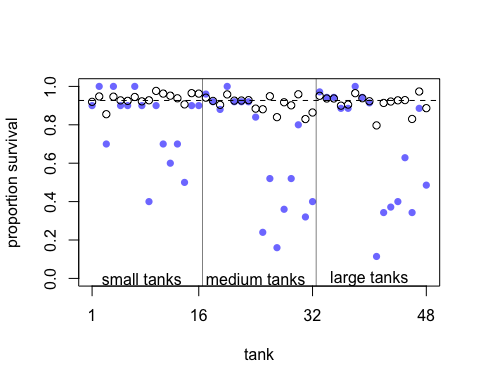
post\_pred(model = Q12M1\_size, df = d)



post\_pred(model = Q12M1\_both, df = d)



post\_pred(model = Q12M1\_interaction, df = d)



coeftab(Q12M1\_pred, Q12M1\_size, Q12M1\_both, Q12M1\_interaction)

## Q12M1\_pred Q12M1\_size Q12M1\_both Q12M1\_interaction  
## alpha[1] 2.50 2.45 2.86 2.46   
## alpha[2] 3.00 3.34 3.31 2.89   
## alpha[3] 1.69 1.30 2.12 1.75   
## alpha[4] 2.97 3.33 3.29 2.91   
## alpha[5] 2.51 2.21 2.71 2.55   
## alpha[6] 2.51 2.23 2.72 2.50   
## alpha[7] 2.98 3.17 3.11 2.90   
## alpha[8] 2.51 2.23 2.71 2.47   
## alpha[9] 2.26 0.14 2.68 2.53   
## alpha[10] 3.60 2.41 3.96 3.76   
## alpha[11] 3.03 1.32 3.44 3.26   
## alpha[12] 2.78 0.89 3.18 3.03   
## alpha[13] 3.05 1.05 3.11 2.73   
## alpha[14] 2.51 0.22 2.63 2.25   
## alpha[15] 3.59 2.22 3.68 3.30   
## alpha[16] 3.61 2.22 3.71 3.28   
## alpha[17] 2.91 3.23 3.25 2.83   
## alpha[18] 2.57 2.68 2.97 2.51   
## alpha[19] 2.30 2.31 2.70 2.25   
## alpha[20] 3.29 3.95 3.62 3.16   
## alpha[21] 2.58 2.43 2.70 2.55   
## alpha[22] 2.56 2.42 2.71 2.55   
## alpha[23] 2.55 2.44 2.71 2.57   
## alpha[24] 2.04 1.73 2.16 2.05   
## alpha[25] 1.60 -0.69 2.09 2.00   
## alpha[26] 2.57 0.49 3.01 2.92   
## alpha[27] 1.29 -1.13 1.76 1.68   
## alpha[28] 2.04 -0.16 2.49 2.42   
## alpha[29] 2.55 0.18 2.62 2.22   
## alpha[30] 3.53 1.45 3.60 3.17   
## alpha[31] 1.90 -0.61 1.96 1.58   
## alpha[32] 2.16 -0.29 2.23 1.83   
## alpha[33] 3.10 3.51 3.47 3.00   
## alpha[34] 2.76 3.03 3.17 2.72   
## alpha[35] 2.79 3.03 3.17 2.72   
## alpha[36] 2.29 2.39 2.72 2.23   
## alpha[37] 2.28 2.10 2.42 2.28   
## alpha[38] 3.43 3.94 3.55 3.34   
## alpha[39] 2.77 2.75 2.90 2.75   
## alpha[40] 2.50 2.34 2.63 2.50   
## alpha[41] 0.96 -1.49 1.44 1.38   
## alpha[42] 1.95 -0.25 2.41 2.35   
## alpha[43] 2.04 -0.13 2.52 2.45   
## alpha[44] 2.16 0.00 2.62 2.54   
## alpha[45] 2.94 0.59 2.98 2.56   
## alpha[46] 1.94 -0.57 1.99 1.58   
## alpha[47] 4.03 2.09 4.06 3.64   
## alpha[48] 2.44 0.01 2.48 2.06   
## a 2.58 1.55 2.84 2.57   
## sigma 0.82 1.63 0.78 0.74   
## beta\_pred -2.47 NA -2.47 -2.02   
## beta\_frogsize NA -0.33 -0.52 0.10   
## beta\_pred\_frogsize NA NA NA -1.03   
## nobs 48 48 48 48

After more predictors were added, the amount of variation decreased across tanks. The reason is because more of the variation could be explained when adding more predictors.

# 12M2. Compare the models you fit just above, using WAIC. Can you reconcile the differences in WAIC with the posterior distributions of the models?

compare(Q12M1\_pred, Q12M1\_size, Q12M1\_both, Q12M1\_interaction)

## WAIC pWAIC dWAIC weight SE dSE  
## Q12M1\_interaction 999.7 27.5 0.0 0.54 37.80 NA  
## Q12M1\_pred 1001.4 28.7 1.6 0.24 37.36 2.70  
## Q12M1\_both 1001.6 28.3 1.8 0.22 37.76 2.52  
## Q12M1\_size 1008.7 37.4 9.0 0.01 38.24 7.25

precis(Q12M1\_size)

## 48 vector or matrix parameters omitted in display. Use depth=2 to show them.

## Mean StdDev lower 0.89 upper 0.89 n\_eff Rhat  
## a 1.55 0.36 1.06 2.24 208 1.02  
## sigma 1.63 0.21 1.29 1.94 1000 1.00  
## beta\_frogsize -0.33 0.47 -1.09 0.40 121 1.03

precis(Q12M1\_pred)

## 48 vector or matrix parameters omitted in display. Use depth=2 to show them.

## Mean StdDev lower 0.89 upper 0.89 n\_eff Rhat  
## a 2.58 0.23 2.23 2.97 226 1.02  
## sigma 0.82 0.14 0.62 1.07 380 1.00  
## beta\_pred -2.47 0.28 -2.98 -2.06 182 1.02

# 12M3. Re-estimate the basic Reed frog varying intercept model,but now using a Cauchy distribution in place of the Gaussian distribution for the varying intercepts. That is, fit this model:

si ∼ Binomial(ni, pi) logit(pi) = αtank[i] αtank ∼ Cauchy(α, σ) α ∼ Normal(0, 1) σ ∼ HalfCauchy(0, 1)

Compare the posterior means of the intercepts, αtank, to the posterior means produced in the chapter, using the customary Gaussian prior. Can you explain the pattern of differences?

m12M3.alpha.cauchy <- map2stan(  
 alist(  
 surv ~ dbinom(density, p) ,  
 logit(p) <- alpha[tank],  
 alpha[tank] ~ dcauchy(m, shape),  
 m ~ dnorm(0, 10),  
 shape ~ dcauchy(0, 1)  
 ), data=d )

## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:2:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/QR:17:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Eigenvalues:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/operator\_unary\_plus.hpp:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/scal/fun/constants.hpp:4:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/constants/constants.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:27:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af27fa0c8fc.cpp:519:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af27fa0c8fc.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.  
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 2.2e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.22 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## Iteration: 1 / 2000 [ 0%] (Warmup)  
## Iteration: 200 / 2000 [ 10%] (Warmup)  
## Iteration: 400 / 2000 [ 20%] (Warmup)  
## Iteration: 600 / 2000 [ 30%] (Warmup)  
## Iteration: 800 / 2000 [ 40%] (Warmup)  
## Iteration: 1000 / 2000 [ 50%] (Warmup)  
## Iteration: 1001 / 2000 [ 50%] (Sampling)  
## Iteration: 1200 / 2000 [ 60%] (Sampling)  
## Iteration: 1400 / 2000 [ 70%] (Sampling)  
## Iteration: 1600 / 2000 [ 80%] (Sampling)  
## Iteration: 1800 / 2000 [ 90%] (Sampling)  
## Iteration: 2000 / 2000 [100%] (Sampling)  
##   
## Elapsed Time: 0.775322 seconds (Warm-up)  
## 1.39522 seconds (Sampling)  
## 2.17054 seconds (Total)  
##   
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 1.5e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.15 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 1e-06 seconds (Warm-up)  
## 7.4e-05 seconds (Sampling)  
## 7.5e-05 seconds (Total)

## Computing WAIC

## Constructing posterior predictions

## [ 100 / 1000 ]  
[ 200 / 1000 ]  
[ 300 / 1000 ]  
[ 400 / 1000 ]  
[ 500 / 1000 ]  
[ 600 / 1000 ]  
[ 700 / 1000 ]  
[ 800 / 1000 ]  
[ 900 / 1000 ]  
[ 1000 / 1000 ]

## Aggregated binomial counts detected. Splitting to 0/1 outcome for WAIC calculation.

m12M3.alpha.normal <- map2stan(  
 alist(  
 surv ~ dbinom(density, p) ,  
 logit(p) <- alpha[tank],  
 alpha[tank] ~ dnorm(a, sigma),  
 a ~ dnorm(0, 10),  
 sigma ~ dcauchy(0, 1)  
 ), data=d )

## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:2:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/QR:17:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Eigenvalues:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/operator\_unary\_plus.hpp:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/scal/fun/constants.hpp:4:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/constants/constants.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:27:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af229d9e86.cpp:516:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af229d9e86.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.  
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 1.8e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.18 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## Iteration: 1 / 2000 [ 0%] (Warmup)  
## Iteration: 200 / 2000 [ 10%] (Warmup)  
## Iteration: 400 / 2000 [ 20%] (Warmup)  
## Iteration: 600 / 2000 [ 30%] (Warmup)  
## Iteration: 800 / 2000 [ 40%] (Warmup)  
## Iteration: 1000 / 2000 [ 50%] (Warmup)  
## Iteration: 1001 / 2000 [ 50%] (Sampling)  
## Iteration: 1200 / 2000 [ 60%] (Sampling)  
## Iteration: 1400 / 2000 [ 70%] (Sampling)  
## Iteration: 1600 / 2000 [ 80%] (Sampling)  
## Iteration: 1800 / 2000 [ 90%] (Sampling)  
## Iteration: 2000 / 2000 [100%] (Sampling)  
##   
## Elapsed Time: 0.16815 seconds (Warm-up)  
## 0.119124 seconds (Sampling)  
## 0.287274 seconds (Total)  
##   
##   
## SAMPLING FOR MODEL 'surv ~ dbinom(density, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 1.6e-05 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 0.16 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 1e-06 seconds (Warm-up)  
## 6.2e-05 seconds (Sampling)  
## 6.3e-05 seconds (Total)

## Warning: There were 1 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup

## Warning: Examine the pairs() plot to diagnose sampling problems

## Computing WAIC  
## Constructing posterior predictions

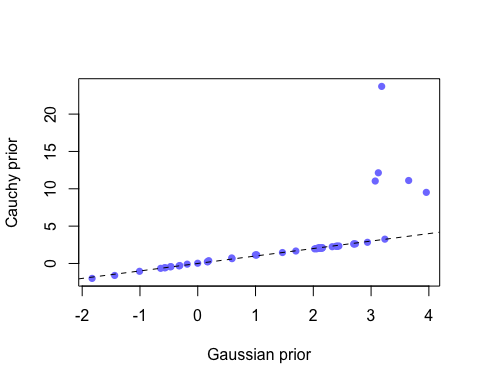
## [ 100 / 1000 ]  
[ 200 / 1000 ]  
[ 300 / 1000 ]  
[ 400 / 1000 ]  
[ 500 / 1000 ]  
[ 600 / 1000 ]  
[ 700 / 1000 ]  
[ 800 / 1000 ]  
[ 900 / 1000 ]  
[ 1000 / 1000 ]

## Aggregated binomial counts detected. Splitting to 0/1 outcome for WAIC calculation.

# compare  
coeftab(m12M3.alpha.cauchy, m12M3.alpha.normal)

## m12M3.alpha.cauchy m12M3.alpha.normal  
## alpha[1] 2.09 2.15   
## alpha[2] 11.04 3.07   
## alpha[3] 1.14 1.00   
## alpha[4] 12.14 3.13   
## alpha[5] 2.04 2.11   
## alpha[6] 2.11 2.16   
## alpha[7] 23.71 3.18   
## alpha[8] 2.12 2.09   
## alpha[9] -0.09 -0.18   
## alpha[10] 2.04 2.11   
## alpha[11] 1.13 1.01   
## alpha[12] 0.74 0.59   
## alpha[13] 1.15 1.02   
## alpha[14] 0.37 0.19   
## alpha[15] 2.06 2.12   
## alpha[16] 2.04 2.15   
## alpha[17] 2.83 2.94   
## alpha[18] 2.31 2.39   
## alpha[19] 1.96 2.02   
## alpha[20] 11.11 3.65   
## alpha[21] 2.29 2.41   
## alpha[22] 2.31 2.41   
## alpha[23] 2.34 2.44   
## alpha[24] 1.67 1.70   
## alpha[25] -1.05 -1.01   
## alpha[26] 0.23 0.17   
## alpha[27] -1.60 -1.44   
## alpha[28] -0.45 -0.48   
## alpha[29] 0.23 0.17   
## alpha[30] 1.46 1.47   
## alpha[31] -0.65 -0.64   
## alpha[32] -0.28 -0.31   
## alpha[33] 3.25 3.24   
## alpha[34] 2.62 2.70   
## alpha[35] 2.61 2.70   
## alpha[36] 1.97 2.06   
## alpha[37] 2.01 2.06   
## alpha[38] 9.52 3.96   
## alpha[39] 2.62 2.73   
## alpha[40] 2.24 2.33   
## alpha[41] -2.00 -1.83   
## alpha[42] -0.57 -0.58   
## alpha[43] -0.43 -0.46   
## alpha[44] -0.33 -0.32   
## alpha[45] 0.64 0.59   
## alpha[46] -0.57 -0.56   
## alpha[47] 2.00 2.05   
## alpha[48] 0.03 0.00   
## m 1.51 NA   
## shape 1.04 NA   
## a NA 1.37   
## sigma NA 1.63   
## nobs 48 48

# plot with author's code  
post.normal <- extract.samples(m12M3.alpha.normal)  
alpha.tank.normal <- apply(X = post.normal$alpha, MARGIN = 2, FUN = mean)  
post.cauchy <- extract.samples(m12M3.alpha.cauchy)  
alpha.tank.cauchy <- apply(X = post.cauchy$alpha, MARGIN = 2, FUN = mean)  
plot( alpha.tank.normal , alpha.tank.cauchy , pch=16 , col=rangi2 ,  
 xlab="Gaussian prior" , ylab="Cauchy prior" )  
abline(a=0, b=1, lty=2)



Somse of the Cauchy means are larger. The reason being that the cauchy has a longer tail and more data points that are possible. The Gaussian prior pulls extreme data points more than the Cauchy.

# 12M4. Fit the following cross-classified multilevel model to the chimpanzees data:

Li ∼ Binomial(1, pi) logit(pi) = αactor[i] + αblock[i] + (βP + βPCCi)Pi αactor ∼ Normal(α, σactor) αblock ∼ Normal(γ, σblock) α,γ,βP,βPC ∼ Normal(0,10) σactor, σblock ∼ HalfCauchy(0, 1)

Each of the parameters in those comma-separated lists gets the same independent prior. Compare the posterior distribution to that produced by the similar cross-classified model from the chapter. Also compare the number of effective samples. Can you explain the differences?

data(chimpanzees)  
d <- chimpanzees  
str(d)

## 'data.frame': 504 obs. of 8 variables:  
## $ actor : int 1 1 1 1 1 1 1 1 1 1 ...  
## $ recipient : int NA NA NA NA NA NA NA NA NA NA ...  
## $ condition : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ block : int 1 1 1 1 1 1 2 2 2 2 ...  
## $ trial : int 2 4 6 8 10 12 14 16 18 20 ...  
## $ prosoc\_left : int 0 0 1 0 1 1 1 1 0 0 ...  
## $ chose\_prosoc: int 1 0 0 1 1 1 0 0 1 1 ...  
## $ pulled\_left : int 0 1 0 0 1 1 0 0 0 0 ...

d$block\_id <- d$block  
d$actor <- d$actor  
  
m12.5 <- map2stan(  
 alist(  
 pulled\_left ~ dbinom( 1 , p ),  
 logit(p) <- a\_actor[actor] + a\_block[block\_id] +  
 (bp + bpc\*condition)\*prosoc\_left,  
 a\_actor[actor] ~ dnorm( a , sigma\_actor ),  
 a\_block[block\_id] ~ dnorm( y , sigma\_block ),  
 c(a,y,bp,bpc) ~ dnorm(0,10),  
 sigma\_actor ~ dcauchy(0,1),  
 sigma\_block ~ dcauchy(0,1)  
),  
data=d, warmup=1000 , iter=6000 , chains=4 , cores=3 )

## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/gevv\_vvv\_vari.hpp:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/var.hpp:7:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/config.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config.hpp:39:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/config/compiler/clang.hpp:200:11: warning: 'BOOST\_NO\_CXX11\_RVALUE\_REFERENCES' macro redefined [-Wmacro-redefined]  
## # define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES  
## ^  
## <command line>:6:9: note: previous definition is here  
## #define BOOST\_NO\_CXX11\_RVALUE\_REFERENCES 1  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:1:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Core:531:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:2:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/LU:47:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Jacobi:29:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Cholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/QR:17:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Householder:27:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:5:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SVD:48:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Geometry:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:14:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/matrix\_vari.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat/fun/Eigen\_NumTraits.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/Eigen.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Dense:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Eigenvalues:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/operator\_unary\_plus.hpp:7:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/scal/fun/constants.hpp:4:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/constants/constants.hpp:13:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/math/tools/convert\_from\_string.hpp:15:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast.hpp:32:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/try\_lexical\_convert.hpp:42:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/lexical\_cast/detail/converter\_lexical.hpp:52:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/container\_fwd.hpp:61:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/container/detail/std\_fwd.hpp:27:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:26:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCore:66:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:27:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/OrderingMethods:71:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:29:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseCholesky:43:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:32:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/SparseQR:35:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:83:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/csr\_extract\_u.hpp:6:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/Sparse:33:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/IterativeLinearSolvers:46:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/RcppEigen/include/Eigen/src/Core/util/ReenableStupidWarnings.h:10:30: warning: pragma diagnostic pop could not pop, no matching push [-Wunknown-pragmas]  
## #pragma clang diagnostic pop  
## ^  
## In file included from file12af25fa99591.cpp:736:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/rstaninc.hpp:3:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/rstan/include/rstan/stan\_fit.hpp:36:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/services/optimize/bfgs.hpp:11:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/bfgs.hpp:9:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/optimization/lbfgs\_update.hpp:6:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer.hpp:54:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/circular\_buffer/details.hpp:20:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/move.hpp:30:  
## In file included from /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/iterator.hpp:27:  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/iterator\_traits.hpp:29:1: warning: inline namespaces are a C++11 feature [-Wc++11-inline-namespace]  
## BOOST\_MOVE\_STD\_NS\_BEG  
## ^  
## /Library/Frameworks/R.framework/Versions/3.5/Resources/library/BH/include/boost/move/detail/std\_ns\_begin.hpp:18:34: note: expanded from macro 'BOOST\_MOVE\_STD\_NS\_BEG'  
## #define BOOST\_MOVE\_STD\_NS\_BEG \_LIBCPP\_BEGIN\_NAMESPACE\_STD  
## ^  
## /Applications/Xcode.app/Contents/Developer/Toolchains/XcodeDefault.xctoolchain/usr/include/c++/v1/\_\_config:390:52: note: expanded from macro '\_LIBCPP\_BEGIN\_NAMESPACE\_STD'  
## #define \_LIBCPP\_BEGIN\_NAMESPACE\_STD namespace std {inline namespace \_LIBCPP\_NAMESPACE {  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:44:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints.hpp:14:17: warning: unused function 'set\_zero\_all\_adjoints' [-Wunused-function]  
## static void set\_zero\_all\_adjoints() {  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core.hpp:45:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/core/set\_zero\_all\_adjoints\_nested.hpp:17:17: warning: 'static' function 'set\_zero\_all\_adjoints\_nested' declared in header file should be declared 'static inline' [-Wunneeded-internal-declaration]  
## static void set\_zero\_all\_adjoints\_nested() {  
## ^  
## In file included from file12af25fa99591.cpp:8:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/src/stan/model/model\_header.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math.hpp:4:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/rev/mat.hpp:12:  
## In file included from /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat.hpp:58:  
## /Users/yemiliyakozhokar 1/Library/R/3.5/library/StanHeaders/include/stan/math/prim/mat/fun/autocorrelation.hpp:17:14: warning: function 'fft\_next\_good\_size' is not needed and will not be emitted [-Wunneeded-internal-declaration]  
## size\_t fft\_next\_good\_size(size\_t N) {  
## ^  
## 19 warnings generated.  
## ld: warning: text-based stub file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation.tbd and library file /System/Library/Frameworks//CoreFoundation.framework/CoreFoundation are out of sync. Falling back to library file for linking.

## Warning: There were 6115 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup

## Warning: There were 320 transitions after warmup that exceeded the maximum treedepth. Increase max\_treedepth above 10. See  
## http://mc-stan.org/misc/warnings.html#maximum-treedepth-exceeded

## Warning: Examine the pairs() plot to diagnose sampling problems

##   
## SAMPLING FOR MODEL 'pulled\_left ~ dbinom(1, p)' NOW (CHAIN 1).  
##   
## Gradient evaluation took 0.001136 seconds  
## 1000 transitions using 10 leapfrog steps per transition would take 11.36 seconds.  
## Adjust your expectations accordingly!  
##   
##   
## WARNING: No variance estimation is  
## performed for num\_warmup < 20  
##   
## Iteration: 1 / 1 [100%] (Sampling)  
##   
## Elapsed Time: 1e-06 seconds (Warm-up)  
## 0.000352 seconds (Sampling)  
## 0.000353 seconds (Total)

## Warning: There were 1 divergent transitions after warmup. Increasing adapt\_delta above 0.8 may help. See  
## http://mc-stan.org/misc/warnings.html#divergent-transitions-after-warmup  
  
## Warning: Examine the pairs() plot to diagnose sampling problems

## Computing WAIC

## Constructing posterior predictions

## [ 2000 / 20000 ]  
[ 4000 / 20000 ]  
[ 6000 / 20000 ]  
[ 8000 / 20000 ]  
[ 10000 / 20000 ]  
[ 12000 / 20000 ]  
[ 14000 / 20000 ]  
[ 16000 / 20000 ]  
[ 18000 / 20000 ]  
[ 20000 / 20000 ]

## Warning in map2stan(alist(pulled\_left ~ dbinom(1, p), logit(p) <- a\_actor[actor] + : There were 6115 divergent iterations during sampling.  
## Check the chains (trace plots, n\_eff, Rhat) carefully to ensure they are valid.

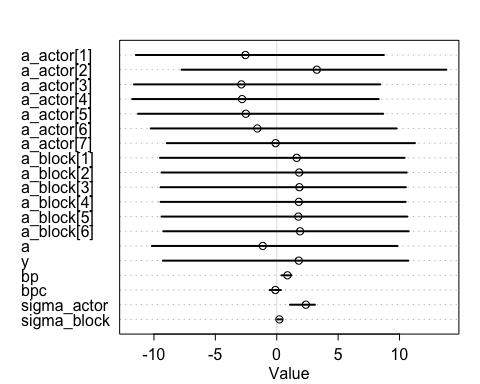
precis(m12.5,depth=2) # depth=2 displays varying effects

## Warning in precis(m12.5, depth = 2): There were 6115 divergent iterations during sampling.  
## Check the chains (trace plots, n\_eff, Rhat) carefully to ensure they are valid.

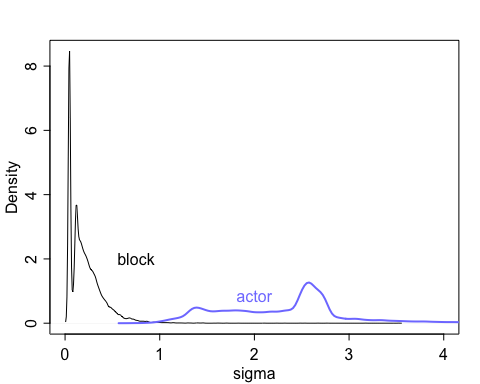
## Mean StdDev lower 0.89 upper 0.89 n\_eff Rhat  
## a\_actor[1] -2.55 7.04 -11.47 8.73 8 1.15  
## a\_actor[2] 3.27 6.92 -7.74 13.81 16 1.10  
## a\_actor[3] -2.88 7.07 -11.62 8.42 8 1.16  
## a\_actor[4] -2.82 7.02 -11.77 8.30 8 1.15  
## a\_actor[5] -2.52 7.02 -11.29 8.67 8 1.15  
## a\_actor[6] -1.58 7.03 -10.26 9.76 8 1.15  
## a\_actor[7] -0.09 7.07 -8.96 11.25 8 1.16  
## a\_block[1] 1.62 7.04 -9.51 10.41 8 1.15  
## a\_block[2] 1.83 6.99 -9.38 10.58 9 1.15  
## a\_block[3] 1.84 6.99 -9.46 10.51 9 1.15  
## a\_block[4] 1.80 7.00 -9.47 10.49 9 1.15  
## a\_block[5] 1.76 7.00 -9.38 10.62 8 1.15  
## a\_block[6] 1.90 6.98 -9.24 10.75 9 1.14  
## a -1.14 6.83 -10.17 9.83 10 1.12  
## y 1.79 7.00 -9.27 10.72 8 1.15  
## bp 0.87 0.27 0.39 1.21 16 1.09  
## bpc -0.11 0.28 -0.58 0.34 21 1.06  
## sigma\_actor 2.37 0.84 1.08 3.11 154 1.02  
## sigma\_block 0.22 0.19 0.04 0.43 6 1.21

plot(precis(m12.5,depth=2)) # also plot

## Warning in precis(m12.5, depth = 2): There were 6115 divergent iterations during sampling.  
## Check the chains (trace plots, n\_eff, Rhat) carefully to ensure they are valid.



post <- extract.samples(m12.5)  
dens( post$sigma\_block , xlab="sigma" , xlim=c(0,4) )  
dens( post$sigma\_actor , col=rangi2 , lwd=2 , add=TRUE )  
text( 2 , 0.85 , "actor" , col=rangi2 )  
text( 0.75 , 2 , "block" )



Yes, because there is less variation and more shrinkage, there will be more effective samples. Again, the reason being that the more samples provided in the model, the more likelihood of effective samples.