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data {
  int<lower=0> n;
  int<lower=0> m;
  vector[m] student;
  vector[m] science;
  vector[m] cwordspl;
  vector[n] cond;
  vector[n] dapq;
  vector[n] wordspl;
  vector[n] condword;
  vector[n] ysci;
  vector[n] ystu;
  vector[n] time2shock;
  vector[n] time2shocklast2;
}

parameters {
  vector[2] aword;
  real<lower=0> sigma_word;

  vector[4] aapq;
  real<lower=0> sigma_apq;

  vector[3] atime;
  real<lower=0> sigma_time;

  vector[2] asci;
  real<lower=0> sigma_sci;

  vector[2] astu;
  real<lower=0> sigma_stu;

  vector[3] acword;
  real<lower=0> sigma_cword;
}

model {
  real s;
  real s2;
  s = 10;
  s2 = 5;

  for(i in 1:2) {
    aword[i] ~ normal(0,s);
    acword[i] ~ normal(0,s);
    aapq[i] ~ normal(0,s);
    atime[i] ~ normal(0,s);
    asci[i] ~ normal(0,s);
    astu[i] ~ normal(0,s);
  }
}

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for(i in 3:4) {
  aapq[i] ~ normal(0,s);
}
atime[3] ~ normal(0,s);
acword[3] ~ normal(0,s);

sigma_word ~ cauchy(0,s2);
sigma_cword ~ cauchy(0,s2);
sigma_apq ~ cauchy(0,s2);
sigma_time ~ cauchy(0,s2);
sigma_sci ~ cauchy(0,s2);
sigma_stu ~ cauchy(0,s2);

wordspl ~ normal(aword[1] + aword[2]*cond, sigma_word);
cwordspl ~ normal(acword[1] + acword[2]*student +
acword[3]*science, sigma_cword);
dapq ~ normal(aapq[1] + aapq[2]*cond + aapq[3]*wordspl +
aapq[4]*condword, sigma_apq);
time2shocklast2 ~ normal(atime[1] + atime[2]*time2shock +
atime[3]*cond, sigma_time);
ysci ~ normal(asci[1] + asci[2]*cond, sigma_sci);
ystu ~ normal(astu[1] + astu[2]*cond, sigma_stu);
}

generated quantities {
  vector[n] wordspl_new;
  vector[n] dapq_new;
  vector[n] time2shocklast2_new;
  vector[n] ysci_new;
  vector[n] ystu_new;
  vector[m] cwordspl_new;

  for(i in 1:n) {
    wordspl_new[i] = normal_rng(aword[1] + aword[2]*cond[i],
sigma_word);
    dapq_new[i] = normal_rng(aapq[1] + aapq[2]*cond[i] +
aapq[3]*wordspl[i] + aapq[4]*condword[i], sigma_apq);
    time2shocklast2_new[i] = normal_rng(atime[1] +
atime[2]*time2shock[i] + atime[3]*cond[i], sigma_time);
    ysci_new[i] = normal_rng(asci[1] +
asci[2]*cond[i], sigma_sci);
    ystu_new[i] = normal_rng(astu[1] +
astu[2]*cond[i], sigma_stu);
  }
  for(i in 1:m)
    cwordspl_new[i] = normal_rng(acword[1] + acword[2]*student[i]
+ acword[3]*science[i], sigma_cword);
}
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