Homework 9

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Part 1

Prior literature in the field of children's pedagogical cognition has shown that young children are quite adept when placed in a pedagogical role: they use more generic language, tailor the content of their instruction to the knowledge and abilities of the learner, and teach veridical information (Baer & Friedman, 2018; Gelman et al., 2016). A factor that has been shown to influence adults' propensity to spread information is the information's sensational character (Chen et al., 2015). The present study investigates whether children tend to teach sensational rather than neutral information (Experiment 1), and whether their potential preference for sensational information shifts when sensationalism is pitted against veracity (Experiment 2). In Experiment 1 (N = 24, 12 female), 5-year-olds were presented with 12 pairs of information from which they chose one item each to teach to a learner. Results revealed that children taught significantly more sensational than neutral information, $p < .001$ (69% sensational, 31% neutral).

In Experiment 2, I investigate whether children overcome their preference for sharing sensational information when the information is false. In this experiment, 4- and 5-year-olds are asked to select a fact to teach a peer. Truth (true vs. false) and sensational character (sensational vs. neutral) are independently varied. Experiment 2 is a between-subjects design with two conditions (truth value assigned and no truth value assigned). The no truth value assigned condition is a replication and extension of the findings from Experiment 1 for 4- and 5-year-olds. In the truth value assigned condition, children are presented with 12 pairs of facts (one sensational, one neutral) in 12 trials. Critically, one of the facts is accurately depicted in the stimulus, and another is proven false in the stimulus. For example, for the pair, "Caks have three brains (S) / Caks have one brain (N)", the stimulus picture will depict a "Cak" with one brain (true). We predict that children's preference for teaching sensational information will be reduced if they observe that the information is false. We predict that 5-year-olds will be better than 4-year-olds at teaching facts that are true.

Research Questions

1. Does the truth value of the information predict children's transmission of interesting information?
2. Des the interestingness of the information predict children's transmission of true information?

Data Structure

My data has a cross-classified multilevel structure, with fact selections (10) at level 1, and participants at level 2. It also has a cross-classified structure, since responses are nested within participants (level 2 predictor: age) and nested within items (10 total).

A power analysis determined that I will need 24 participants per age group per condition, so there will be 240 observations at level 1.

Plan of Data Analysis

I will conduct a mixed-effects logistic regression for this data, allowing for random slopes (after testing for random slopes) and random intercepts at both the participants and the item level. The outcome, fact selection (0 = neutral, 1 = sensational for research question 1, and 0 = false, 1 = true for research question 2), will be predicted by truth X interesting condition (level 1 predictor), age (level 2 predictor), and nested within participants and items.

Part 2

Variables:

Age (level 2 predictor, “age”): 4-year-olds and 5-year-olds

Truth X Sensational condition (level 1 predictor, “intrue”): whether the sensational fact is true (1) or the neutral fact is true (0)

Truth X Sensational condition (level 1 predictor, “intrue”): whether the true fact is neutral (0) or interesting (1)

Response (outcome variable, “inres”): whether the fact taught is sensational (1) or neutral (0)

Response (outcome variable, “trueres”): whether the fact taught is false (0) or true (1)

Model Equations

Since I have two research questions, two models will be used to address each one. Both models have the same model equations, except for Response is “intrue” for one model, and “trueres” for the other.

Repeated measures(level 1):

$$\text{Response}_{i(j,k)} = \text{Bernoulli}(\mu_{i(j,k)})$$

$$\eta_{i(j,k)} = \text{logit}(\mu_{i(j,k)}) = \log[\mu_{i(j,k)}/(1 - \mu_{i(j,k)})]$$

$$\eta_{ij} = \beta_{0(j,k)}$$

Between-cell (Person X Item) level (Level 2):

$$\beta_{0(j,k)} = \gamma_{00} + \beta_{1ij}\text{truth*sensational}_{ik} + \beta_{2ik}\text{age}_{ij} + \beta_{3ij}\text{truth*sensational}_{ik} \times \text{age}_{ij} + u_{0ij} + v_{0ik} + e_{ijk}$$

Person-level random slopes (Level 2):

$$\beta_{1ij} = \gamma_{10} + \gamma_{11}\text{age} + u_{1j}$$

$$\beta_{3ij} = \gamma_{30} + \gamma_{31}\text{age} + u_{3j}$$

Item-level (Level 2b)

$$\beta_{2ik} = \gamma_{20} + v_{2k}$$

where k is item, j is person, and i is observation

Load data

```
dat <- read_xlsx(here("Flashy Coding Sheet exp 2.xlsx"))
dat$intrue <- as.factor(dat$intrue)
dat$inres <- as.factor(dat$inres)
dat$trueres <- as.factor(dat$trueres)
dat$age <- as.factor(dat$age)
```

Where intrue = 0 is when the interesting fact is false (and thus the neutral fact true), and intrue = 1 is when the interesting fact is true (and thus the neutral fact false)

Are children’s preferences to teach sensational information predicted by the truth value of the information?

Test random slopes

```
m <- glmer(intrue~ (1|subject), data = dat, family = binomial("logit"))
```

```
## boundary (singular) fit: see help('isSingular')
```

```
summary(m)
```

```
## Generalized linear mixed model fit by maximum likelihood (Laplace
##   Approximation) [glmerMod]
##  Family: binomial  ( logit )
## Formula: intrue ~ (1 | subject)
##    Data: dat
##
##      AIC      BIC   logLik deviance df.resid
##    170.3    175.9    -83.2    166.3      118
##
## Scaled residuals:
##     Min      1Q  Median      3Q     Max
## -0.9835 -0.9835 -0.9835  1.0168  1.0168
##
## Random effects:
##  Groups  Name        Variance Std.Dev.
##  subject (Intercept) 0        0
## Number of obs: 120, groups:  subject, 12
##
## Fixed effects:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) -0.03334    0.18260  -0.183    0.855
## optimizer (Nelder_Mead) convergence code: 0 (OK)
## boundary (singular) fit: see help('isSingular')
```

```
# item-level variable, such as intrue, have no person-level variance
```

```
#brms
#ICC
m_ri1 <- brm(inres ~ intrue * age + (1 | subject) + (1 | item),
           data = dat, family = bernoulli("logit"),
           prior = prior(student_t(3, 0, 1), class = "b"),
           seed = 144)
```

```
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 6.3e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.63 s
econds.
## Chain 1: Adjust your expectations accordingly!
## Chain 1:
## Chain 1:
## Chain 1: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 1: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 1: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 1: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 1: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 1: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 1: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 1: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 1: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 1: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 1: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 1: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 1:
## Chain 1:  Elapsed Time: 0.517572 seconds (Warm-up)
## Chain 1:                0.543668 seconds (Sampling)
## Chain 1:                1.06124 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 2.5e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.25 s
econds.
## Chain 2: Adjust your expectations accordingly!
## Chain 2:
## Chain 2:
## Chain 2: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 2: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 2: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 2: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 2: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 2: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 2: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 2: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 2: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 2: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 2: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 2: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 2:
## Chain 2:  Elapsed Time: 0.488234 seconds (Warm-up)
## Chain 2:                0.543135 seconds (Sampling)
## Chain 2:                1.03137 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 3).
## Chain 3:
```

```
## Chain 3: Gradient evaluation took 2e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.2 se
conds.
## Chain 3: Adjust your expectations accordingly!
## Chain 3:
## Chain 3:
## Chain 3: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 3: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 3: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 3: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 3: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 3: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 3: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 3: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 3: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 3: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 3: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 3: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 3:
## Chain 3:  Elapsed Time: 0.511919 seconds (Warm-up)
## Chain 3:                0.548177 seconds (Sampling)
## Chain 3:                1.0601 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 4).
## Chain 4:
## Chain 4: Gradient evaluation took 2.3e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.23 s
econds.
## Chain 4: Adjust your expectations accordingly!
## Chain 4:
## Chain 4:
## Chain 4: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 4: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 4: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 4: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 4: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 4: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 4: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 4: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 4: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 4: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 4: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 4: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 4:
## Chain 4:  Elapsed Time: 0.571504 seconds (Warm-up)
## Chain 4:                0.549019 seconds (Sampling)
## Chain 4:                1.12052 seconds (Total)
## Chain 4:
```

```
summary(m_ri1)
```

```
##  Family: bernoulli
##   Links: mu = logit
## Formula: inres ~ intrue * age + (1 | subject) + (1 | item)
##    Data: dat (Number of observations: 120)
##   Draws: 4 chains, each with iter = 2000; warmup = 1000; thin = 1;
##          total post-warmup draws = 4000
##
## Group-Level Effects:
## ~item (Number of levels: 10)
##               Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)     0.85      0.60     0.04     2.33 1.00     1367     2121
##
## ~subject (Number of levels: 12)
##               Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)     0.55      0.50     0.02     1.83 1.00     1725     2320
##
## Population-Level Effects:
##              Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## Intercept       -0.33      0.71    -1.90     0.95 1.00     3995     2597
## intrue1          0.45      0.58    -0.68     1.64 1.00     5353     3073
## age5            -4.36      2.00    -9.44    -1.56 1.00     1993     1006
## intrue1:age5    11.16      4.07     5.66    21.45 1.00     1903     1208
##
## Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

```
tot <- 0.85^2 + 0.55^2+(pi^2/3) #total variance
subject <- (0.55^2)/tot
item <- (0.85^2)/tot
tot #total variance is 4.31
```

```
## [1] 4.314868
```

```
subject #variability at the subject level accounts for 7% of the total variability in
responses
```

```
## [1] 0.07010643
```

```
item #variability at the item level accounts for for 17% of the total variability in
 responses
```

```
## [1] 0.1674443
```

```
# need to include random intercept as there is evidence that there is variation acros
s subjects and items.
m_brm <- brm(inres ~ intrue * age + (item | subject) + (subject | item),
           data = dat, family = bernoulli("logit"),
           prior = prior(student_t(3, 0, 1), class = "b"),
           seed = 144)
```

```
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 0.000139 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 1.39 s
econds.
## Chain 1: Adjust your expectations accordingly!
## Chain 1:
## Chain 1:
## Chain 1: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 1: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 1: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 1: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 1: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 1: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 1: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 1: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 1: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 1: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 1: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 1: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 1:
## Chain 1:  Elapsed Time: 1.47498 seconds (Warm-up)
## Chain 1:                1.17885 seconds (Sampling)
## Chain 1:                2.65383 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 3.9e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.39 s
econds.
## Chain 2: Adjust your expectations accordingly!
## Chain 2:
## Chain 2:
## Chain 2: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 2: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 2: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 2: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 2: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 2: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 2: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 2: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 2: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 2: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 2: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 2: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 2:
## Chain 2:  Elapsed Time: 1.39304 seconds (Warm-up)
## Chain 2:                1.20922 seconds (Sampling)
## Chain 2:                2.60226 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 3).
## Chain 3:
```

```
## Chain 3: Gradient evaluation took 3.8e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.38 s
econds.
## Chain 3: Adjust your expectations accordingly!
## Chain 3:
## Chain 3:
## Chain 3: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 3: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 3: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 3: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 3: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 3: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 3: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 3: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 3: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 3: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 3: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 3: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 3:
## Chain 3:  Elapsed Time: 1.63302 seconds (Warm-up)
## Chain 3:                1.2994 seconds (Sampling)
## Chain 3:                2.93242 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 4).
## Chain 4:
## Chain 4: Gradient evaluation took 4.2e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.42 s
econds.
## Chain 4: Adjust your expectations accordingly!
## Chain 4:
## Chain 4:
## Chain 4: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 4: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 4: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 4: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 4: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 4: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 4: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 4: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 4: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 4: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 4: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 4: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 4:
## Chain 4:  Elapsed Time: 1.44304 seconds (Warm-up)
## Chain 4:                1.1718 seconds (Sampling)
## Chain 4:                2.61484 seconds (Total)
## Chain 4:
```

```
summary(m_brm)
```

```
##  Family: bernoulli
##   Links: mu = logit
## Formula: inres ~ intrue * age + (item | subject) + (subject | item)
##    Data: dat (Number of observations: 120)
##   Draws: 4 chains, each with iter = 2000; warmup = 1000; thin = 1;
##          total post-warmup draws = 4000
##
## Group-Level Effects:
## ~item (Number of levels: 10)
##                       Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS
## sd(Intercept)             0.79      0.66     0.03     2.45 1.00     1544
## sd(subject)               0.21      0.17     0.01     0.63 1.00      867
## cor(Intercept,subject)   -0.09      0.56    -0.95     0.92 1.00     1192
##                       Tail_ESS
## sd(Intercept)             1960
## sd(subject)               1401
## cor(Intercept,subject)    2096
##
## ~subject (Number of levels: 12)
##                     Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)           0.73      0.66     0.02     2.38 1.00     1927     1644
## sd(item)                0.14      0.13     0.00     0.48 1.00     1826     2381
## cor(Intercept,item)    -0.16      0.59    -0.97     0.94 1.00     2380     2750
##
## Population-Level Effects:
##              Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## Intercept       -0.71      0.98    -3.05     0.97 1.00     2477     2561
## intrue1          0.52      0.65    -0.70     1.88 1.00     4758     2691
## age5            -5.30      2.87   -12.10    -1.41 1.00     1228      879
## intrue1:age5    14.12      6.26     6.74    29.97 1.01     1076      577
##
## Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

```
#final model
m_brm1 <- brm(inres ~ intrue * age + (1 | subject) + (subject | item),
           data = dat, family = bernoulli("logit"),
           prior = prior(student_t(3, 0, 1), class = "b"),
           seed = 144)
```

```
##
## SAMPLING FOR MODEL 'c3196022f8e474950f4af0c8ffa93f1b' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 0.000106 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 1.06 s
econds.
## Chain 1: Adjust your expectations accordingly!
## Chain 1:
## Chain 1:
## Chain 1: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 1: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 1: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 1: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 1: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 1: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 1: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 1: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 1: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 1: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 1: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 1: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 1:
## Chain 1:  Elapsed Time: 1.2743 seconds (Warm-up)
## Chain 1:                0.91547 seconds (Sampling)
## Chain 1:                2.18977 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'c3196022f8e474950f4af0c8ffa93f1b' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 3.2e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.32 s
econds.
## Chain 2: Adjust your expectations accordingly!
## Chain 2:
## Chain 2:
## Chain 2: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 2: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 2: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 2: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 2: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 2: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 2: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 2: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 2: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 2: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 2: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 2: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 2:
## Chain 2:  Elapsed Time: 0.986825 seconds (Warm-up)
## Chain 2:                1.16351 seconds (Sampling)
## Chain 2:                2.15033 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'c3196022f8e474950f4af0c8ffa93f1b' NOW (CHAIN 3).
## Chain 3:
```

```
## Chain 3: Gradient evaluation took 4.2e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.42 s
econds.
## Chain 3: Adjust your expectations accordingly!
## Chain 3:
## Chain 3:
## Chain 3: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 3: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 3: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 3: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 3: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 3: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 3: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 3: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 3: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 3: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 3: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 3: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 3:
## Chain 3:  Elapsed Time: 1.05279 seconds (Warm-up)
## Chain 3:                1.12766 seconds (Sampling)
## Chain 3:                2.18046 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'c3196022f8e474950f4af0c8ffa93f1b' NOW (CHAIN 4).
## Chain 4:
## Chain 4: Gradient evaluation took 3.2e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.32 s
econds.
## Chain 4: Adjust your expectations accordingly!
## Chain 4:
## Chain 4:
## Chain 4: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 4: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 4: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 4: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 4: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 4: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 4: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 4: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 4: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 4: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 4: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 4: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 4:
## Chain 4:  Elapsed Time: 0.96682 seconds (Warm-up)
## Chain 4:                0.896956 seconds (Sampling)
## Chain 4:                1.86378 seconds (Total)
## Chain 4:
```

```
tab_model(m_brm1)
```

inres

Predictors	*Odds Ratios*	*CI (95%)*

Intercept	0.65	0.10 – 2.58
intrue: intrue1	1.61	0.46 – 6.04
age: age5	0.01	0.00 – 0.18
intrue1:age5	177010.23	587.91 – 344026266236.08

Random Effects

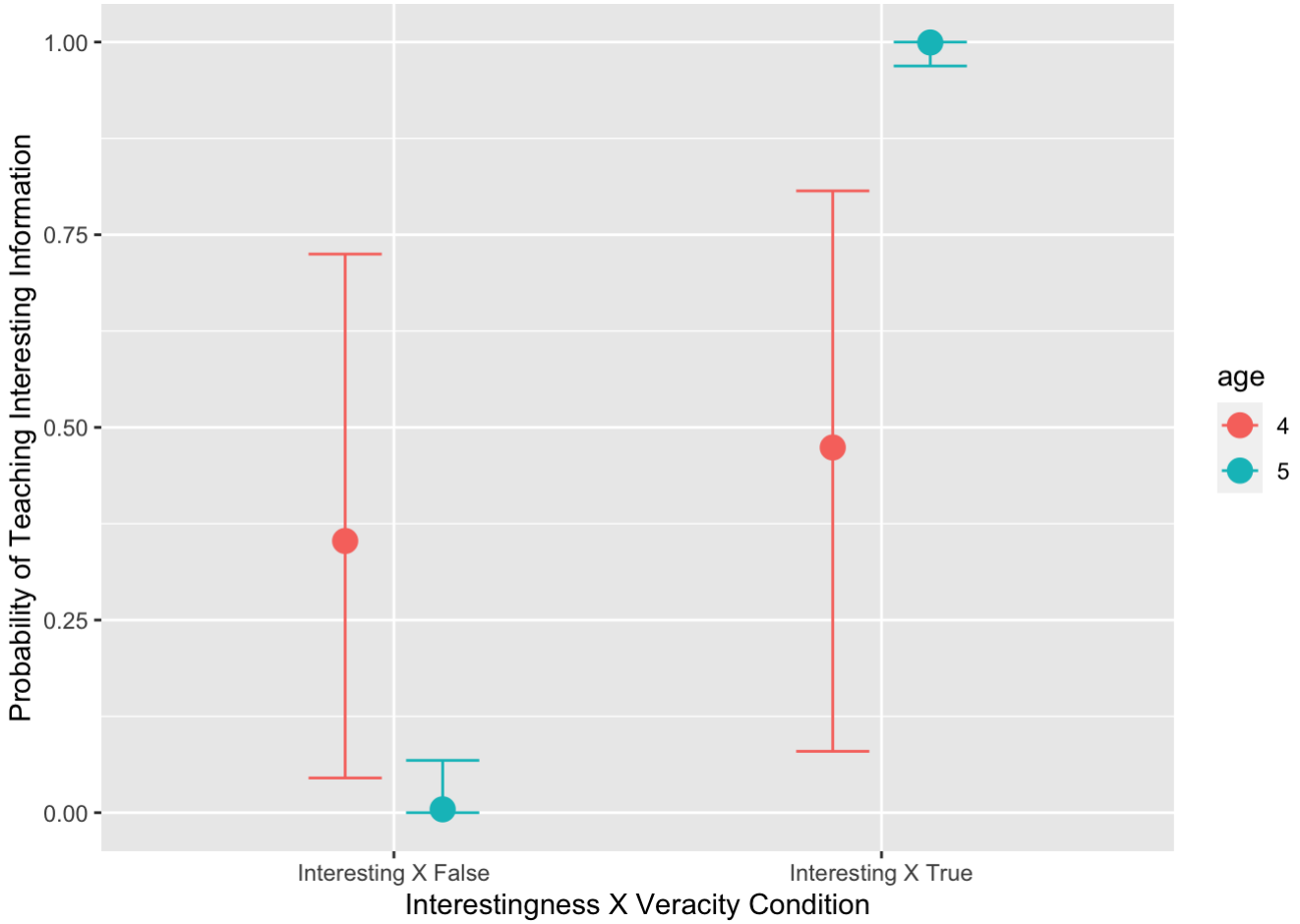
σ^2	3.29
$\tau_{00\ item}$	0.98
$\tau_{00\ subject}$	0.39
$\tau_{11\ item.subject}$	0.07
ρ_{01}	
ρ_{01}	
ICC	0.29
$N_{subject}$	12
N_{item}	10
Observations	120
Marginal R^2 / Conditional R^2	0.654 / 0.720

Since the 95% credible interval for random effects for age does not include 0, 95% CI[0.03, 3.53], age will be included as a random slope. Item will not be included as a random slope because the 95% CI includes 0 [0, 0.39].

Results show a significant interaction, suggesting that the effect of condition (interesting and true vs. interesting and false) on response depends on the age. When the interesting information is false, the log odds of 4-year-olds teaching interesting information is -0.39 (probability = 40%). When the information is true, the log odds of 4-year-olds teaching interesting information is 0.05 (probability = 51%). This difference is not significant for 4-year-olds (95% CI[-0.75, 1.71]). When the interesting information is false, the log odds of 5-year-olds teaching interesting information is -4.85 (probability = 0.7%). This is significantly lower than the log odds of 4-year-olds teaching interesting but false information, 95% CI [-9.18, -1.24].

Lastly, the difference in the slope between information truthfulness and teaching interesting information is significant between 4-year-olds and 5-year-olds: the log odds of 5-year-olds teaching true interesting information is 11.69 more than the log odds of 4-year-olds teaching interesting information， 95% CI [5.77, 22.64].

```
bayes_m1 <- conditional_effects(m_brm)
plot <- plot(bayes_m1, plot = FALSE)[[3]] +
  labs(x = "Interesting X Truth Condition",
       y = "Probability of Teaching Interesting Information")+
  scale_x_discrete("Interestingness X Veracity Condition",
  labels = c("0" = "Interesting X False",
             "1" = "Interesting X True"))
plot
```



Are children's decisions to teach true information predicted by the interestingness of the information?

```
#ICC
m_ri2 <- brm(trueres ~ intrue * age + (1 | subject) + (1 | item),
             data = dat, family = bernoulli("logit"),
             prior = prior(student_t(3, 0, 1), class = "b"),
             seed = 144)
```

```
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 6.3e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.63 s
econds.
## Chain 1: Adjust your expectations accordingly!
## Chain 1:
## Chain 1:
## Chain 1: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 1: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 1: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 1: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 1: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 1: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 1: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 1: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 1: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 1: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 1: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 1: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 1:
## Chain 1:  Elapsed Time: 0.454512 seconds (Warm-up)
## Chain 1:                0.571704 seconds (Sampling)
## Chain 1:                1.02622 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 2e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.2 se
conds.
## Chain 2: Adjust your expectations accordingly!
## Chain 2:
## Chain 2:
## Chain 2: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 2: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 2: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 2: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 2: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 2: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 2: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 2: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 2: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 2: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 2: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 2: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 2:
## Chain 2:  Elapsed Time: 0.438788 seconds (Warm-up)
## Chain 2:                0.479051 seconds (Sampling)
## Chain 2:                0.917839 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 3).
## Chain 3:
```

```
## Chain 3: Gradient evaluation took 2.6e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.26 s
econds.
## Chain 3: Adjust your expectations accordingly!
## Chain 3:
## Chain 3:
## Chain 3: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 3: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 3: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 3: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 3: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 3: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 3: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 3: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 3: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 3: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 3: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 3: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 3:
## Chain 3:  Elapsed Time: 0.405089 seconds (Warm-up)
## Chain 3:                0.577833 seconds (Sampling)
## Chain 3:                0.982922 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL '0f8b69178b46680440e34ed742624093' NOW (CHAIN 4).
## Chain 4:
## Chain 4: Gradient evaluation took 2.5e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.25 s
econds.
## Chain 4: Adjust your expectations accordingly!
## Chain 4:
## Chain 4:
## Chain 4: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 4: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 4: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 4: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 4: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 4: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 4: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 4: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 4: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 4: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 4: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 4: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 4:
## Chain 4:  Elapsed Time: 0.42926 seconds (Warm-up)
## Chain 4:                0.479169 seconds (Sampling)
## Chain 4:                0.908429 seconds (Total)
## Chain 4:
```

```
summary(m_ri2)
```

```
##  Family: bernoulli
##   Links: mu = logit
## Formula: trueres ~ intrue * age + (1 | subject) + (1 | item)
##    Data: dat (Number of observations: 120)
##   Draws: 4 chains, each with iter = 2000; warmup = 1000; thin = 1;
##          total post-warmup draws = 4000
##
## Group-Level Effects:
## ~item (Number of levels: 10)
##               Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)     0.36      0.31     0.01     1.17 1.01     2308     1920
##
## ~subject (Number of levels: 12)
##               Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)     0.98      1.46     0.03     6.75 1.04      125       37
##
## Population-Level Effects:
##              Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## Intercept        0.55      1.49    -0.97     6.10 1.03      127       41
## intrue1          0.13      0.55    -0.95     1.21 1.01     1428      583
## age5             4.71      2.23     0.19     9.74 1.03      146       39
## intrue1:age5     0.44      1.25    -1.75     3.25 1.01     3556     1992
##
## Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

```
tot <- 0.98^2 + 0.36^2+(pi^2/3) #total variance
subject <- (0.98^2)/tot
item <- (0.36^2)/tot
tot #total variance is 4.38
```

```
## [1] 4.379868
```

```
subject #variability at the subject level accounts for 22% of the total variability i
n responses
```

```
## [1] 0.219276
```

```
item #variability at the item level accounts for for 3% of the total variability in r
esponses
```

```
## [1] 0.02958993
```

```
# need to include random intercepts for both subject and item

#brms
m_brm2 <- brm(trueres ~ intrue * age + (item | subject) + (subject | item),
           data = dat, family = bernoulli("logit"),
           prior = prior(student_t(3, 0, 1), class = "b"),
           seed = 144)
```

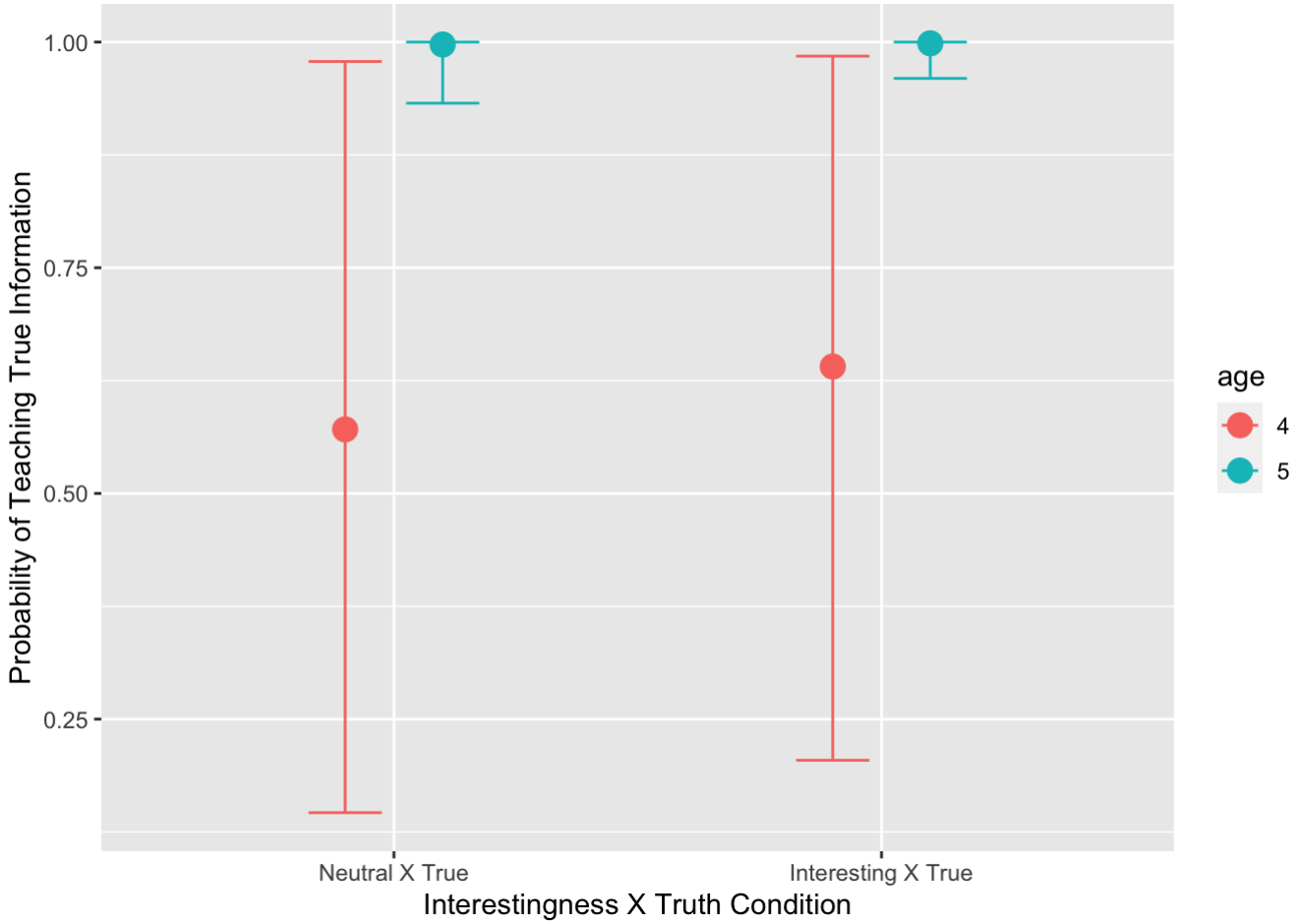
```
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 0.000136 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 1.36 s
econds.
## Chain 1: Adjust your expectations accordingly!
## Chain 1:
## Chain 1:
## Chain 1: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 1: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 1: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 1: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 1: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 1: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 1: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 1: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 1: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 1: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 1: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 1: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 1:
## Chain 1:  Elapsed Time: 1.86574 seconds (Warm-up)
## Chain 1:                2.10231 seconds (Sampling)
## Chain 1:                3.96805 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 4.2e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.42 s
econds.
## Chain 2: Adjust your expectations accordingly!
## Chain 2:
## Chain 2:
## Chain 2: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 2: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 2: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 2: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 2: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 2: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 2: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 2: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 2: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 2: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 2: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 2: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 2:
## Chain 2:  Elapsed Time: 1.88312 seconds (Warm-up)
## Chain 2:                1.64309 seconds (Sampling)
## Chain 2:                3.52621 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 3).
## Chain 3:
```

```
## Chain 3: Gradient evaluation took 4e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.4 se
conds.
## Chain 3: Adjust your expectations accordingly!
## Chain 3:
## Chain 3:
## Chain 3: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 3: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 3: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 3: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 3: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 3: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 3: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 3: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 3: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 3: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 3: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 3: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 3:
## Chain 3:  Elapsed Time: 1.65174 seconds (Warm-up)
## Chain 3:                2.17749 seconds (Sampling)
## Chain 3:                3.82923 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'c205a29da1c04bf55c009c2aa4cccdc9' NOW (CHAIN 4).
## Chain 4:
## Chain 4: Gradient evaluation took 4.9e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.49 s
econds.
## Chain 4: Adjust your expectations accordingly!
## Chain 4:
## Chain 4:
## Chain 4: Iteration:    1 / 2000 [  0%]  (Warmup)
## Chain 4: Iteration:  200 / 2000 [ 10%]  (Warmup)
## Chain 4: Iteration:  400 / 2000 [ 20%]  (Warmup)
## Chain 4: Iteration:  600 / 2000 [ 30%]  (Warmup)
## Chain 4: Iteration:  800 / 2000 [ 40%]  (Warmup)
## Chain 4: Iteration: 1000 / 2000 [ 50%]  (Warmup)
## Chain 4: Iteration: 1001 / 2000 [ 50%]  (Sampling)
## Chain 4: Iteration: 1200 / 2000 [ 60%]  (Sampling)
## Chain 4: Iteration: 1400 / 2000 [ 70%]  (Sampling)
## Chain 4: Iteration: 1600 / 2000 [ 80%]  (Sampling)
## Chain 4: Iteration: 1800 / 2000 [ 90%]  (Sampling)
## Chain 4: Iteration: 2000 / 2000 [100%]  (Sampling)
## Chain 4:
## Chain 4:  Elapsed Time: 1.67054 seconds (Warm-up)
## Chain 4:                2.06411 seconds (Sampling)
## Chain 4:                3.73465 seconds (Total)
## Chain 4:
```

```
summary(m_brm2)
```

```
##  Family: bernoulli
##   Links: mu = logit
## Formula: trueres ~ intrue * age + (item | subject) + (subject | item)
##    Data: dat (Number of observations: 120)
##   Draws: 4 chains, each with iter = 2000; warmup = 1000; thin = 1;
##          total post-warmup draws = 4000
##
## Group-Level Effects:
## ~item (Number of levels: 10)
##                       Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS
## sd(Intercept)             0.73      0.64     0.03     2.35 1.00     1719
## sd(subject)               0.13      0.11     0.01     0.42 1.00     1310
## cor(Intercept,subject)   -0.25      0.57    -0.98     0.90 1.00     1759
##                       Tail_ESS
## sd(Intercept)             1929
## sd(subject)               2025
## cor(Intercept,subject)    2029
##
## ~subject (Number of levels: 12)
##                     Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## sd(Intercept)           2.43      1.60     0.17     6.35 1.00      816     1134
## sd(item)                0.65      0.39     0.14     1.61 1.00      888     1131
## cor(Intercept,item)    -0.68      0.37    -1.00     0.36 1.00      941     1324
##
## Population-Level Effects:
##              Estimate Est.Error l-95% CI u-95% CI Rhat Bulk_ESS Tail_ESS
## Intercept        0.42      1.36    -1.76     3.82 1.00     1071      836
## intrue1          0.32      0.68    -0.95     1.73 1.00     3239     2046
## age5             6.03      3.16     0.73    13.59 1.01      850      837
## intrue1:age5     0.35      1.28    -1.93     3.18 1.00     3878     1767
##
## Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
## and Tail_ESS are effective sample size measures, and Rhat is the potential
## scale reduction factor on split chains (at convergence, Rhat = 1).
```

```
bayes_m2 <- conditional_effects(m_brm2)
plot2 <- plot(bayes_m2, plot = FALSE)[[3]] +
  labs(x = "Interesting X Truth Condition",
       y = "Probability of Teaching True Information")+
  scale_x_discrete("Interestingness X Truth Condition",
  labels = c("0" = "Neutral X True",
             "1" = "Interesting X True"))
plot2
```




```
tab_model(m_brm2)
```

	trueres	
Predictors	*Odds Ratios*	*CI (95%)*
Intercept	1.33	0.17 – 45.50
intrue: intrue1	1.35	0.39 – 5.62
age: age5	291.75	2.08 – 800676.16
intrue1:age5	1.29	0.15 – 24.11

Random Effects

σ^2	3.29
$\tau_{00\ item}$	0.95
$\tau_{00\ subject}$	8.47
$\tau_{11\ item.subject}$	0.03
$\tau_{11\ subject.item}$	0.57
ρ_{01}	
ρ_{01}	
ICC	0.74
$N_{subject}$	12
N_{item}	10

Observations	120
Marginal R^2 / Conditional R^2	0.299 / 0.592

Random slopes for both item and subject were included because the 95% CI did not include 0.

Based on the analysis, it appears that the interestingness of the information does not predict children's decisions to teach true information. There is a significant main effect of age. The probability of 5-year-olds teaching true and neutral information is 99.6%, which is significantly higher than the probability of 4-year-olds teaching true and neutral information, log odds 95% CI [1.79, 11.06].