Affect and SM Use - SMASH Study

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# Descriptive Statistics

## Days in Study  
  
# summarize max days in study  
Max\_days <- data %>%  
 group\_by(pid) %>%  
 summarise(Max\_day = max(day\_in\_study, na.rm=TRUE))  
  
# get mean/sd day in study  
mean(Max\_days$Max\_day, na.rm=TRUE)

## [1] 29.68421

sd(Max\_days$Max\_day, na.rm=TRUE)

## [1] 6.403581

# Models Prediciting Evening Negative Mood

###check utility of random slopes  
model1 <- lmer(NAf\_pm\_p ~ sum\_sm\_p + NAf\_am\_p + sum\_sm\_p\_c + day\_in\_study + (1 | pid), data = day)  
model2 <- lmer(NAf\_pm\_p ~ sum\_sm\_p + NAf\_am\_p + sum\_sm\_p\_c + day\_in\_study + (sum\_sm\_p | pid), data = day)  
  
anova(model1, model2)

## Data: day  
## Models:  
## model1: NAf\_pm\_p ~ sum\_sm\_p + NAf\_am\_p + sum\_sm\_p\_c + day\_in\_study + (1 | pid)  
## model2: NAf\_pm\_p ~ sum\_sm\_p + NAf\_am\_p + sum\_sm\_p\_c + day\_in\_study + (sum\_sm\_p | pid)  
## npar AIC BIC logLik deviance Chisq Df Pr(>Chisq)  
## model1 7 2477.3 2502.9 -1231.7 2463.3   
## model2 9 2481.3 2514.2 -1231.7 2463.3 0 2 1

model3 <- lmer(NAf\_pm\_p ~ count\_sm\_p + NAf\_am\_p + count\_sm\_p\_c + day\_in\_study + (1 | pid), data = day)  
model4 <- lmer(NAf\_pm\_p ~ count\_sm\_p + NAf\_am\_p + count\_sm\_p\_c + day\_in\_study + (count\_sm\_p | pid), data = day)  
  
anova(model3, model4)

## Data: day  
## Models:  
## model3: NAf\_pm\_p ~ count\_sm\_p + NAf\_am\_p + count\_sm\_p\_c + day\_in\_study + (1 | pid)  
## model4: NAf\_pm\_p ~ count\_sm\_p + NAf\_am\_p + count\_sm\_p\_c + day\_in\_study + (count\_sm\_p | pid)  
## npar AIC BIC logLik deviance Chisq Df Pr(>Chisq)  
## model3 7 2475.7 2501.3 -1230.8 2461.7   
## model4 9 2479.7 2512.6 -1230.8 2461.7 0 2 1

#---------------------------------------------Bayesian multilevel models---------------------------------------#  
  
## Negative mood - sumduration  
NA\_sm\_sum\_bayes <- brm(NAf\_pm\_p ~ sum\_sm\_p + NAf\_am\_p + sum\_sm\_p\_c + day\_in\_study + (1 | pid), prior = prior1, data = day)

##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 1).  
## Chain 1:   
## Chain 1: Gradient evaluation took 0 seconds  
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.369 seconds (Warm-up)  
## Chain 1: 0.184 seconds (Sampling)  
## Chain 1: 0.553 seconds (Total)  
## Chain 1:   
##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 2).  
## Chain 2:   
## Chain 2: Gradient evaluation took 0 seconds  
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.377 seconds (Warm-up)  
## Chain 2: 0.229 seconds (Sampling)  
## Chain 2: 0.606 seconds (Total)  
## Chain 2:   
##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 3).  
## Chain 3:   
## Chain 3: Gradient evaluation took 0 seconds  
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.359 seconds (Warm-up)  
## Chain 3: 0.163 seconds (Sampling)  
## Chain 3: 0.522 seconds (Total)  
## Chain 3:   
##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 4).  
## Chain 4:   
## Chain 4: Gradient evaluation took 0 seconds  
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.348 seconds (Warm-up)  
## Chain 4: 0.238 seconds (Sampling)  
## Chain 4: 0.586 seconds (Total)  
## Chain 4:

model\_parameters(NA\_sm\_sum\_bayes, centrality = "mean")

## # Fixed effects  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## ---------------------------------------------------------------------------  
## (Intercept) | -1.74 | [-6.54, 3.09] | 76.17% | 45.13% | 1.001 | 3401.00  
## sum\_sm\_p | 0.03 | [-0.10, 0.16] | 68.12% | 100% | 0.999 | 4411.00  
## NAf\_am\_p | 0.11 | [ 0.01, 0.22] | 98.22% | 100% | 1.000 | 4621.00  
## sum\_sm\_p\_c | -0.02 | [-0.19, 0.15] | 60.48% | 100% | 1.000 | 3814.00  
## day\_in\_study | 0.11 | [-0.13, 0.36] | 81.65% | 100% | 1.000 | 3693.00  
##   
## # Fixed effects sigma  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -----------------------------------------------------------------------  
## sigma | 18.15 | [16.68, 19.72] | 100% | 0% | 1.000 | 4571.00

standard\_error(NA\_sm\_sum\_bayes)

## Parameter SE  
## 1 b\_Intercept 2.49175925  
## 2 b\_sum\_sm\_p 0.06649513  
## 3 b\_NAf\_am\_p 0.05412198  
## 4 b\_sum\_sm\_p\_c 0.08771055  
## 5 b\_day\_in\_study 0.12481564  
## 6 sigma 0.77706632

## Negative mood - counts  
  
NA\_sm\_count\_bayes <- brm(NAf\_pm\_p ~ count\_sm\_p + NAf\_am\_p + count\_sm\_p\_c + day\_in\_study + (1 | pid), prior = prior1, data = day)

##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 1).  
## Chain 1:   
## Chain 1: Gradient evaluation took 0 seconds  
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.392 seconds (Warm-up)  
## Chain 1: 0.205 seconds (Sampling)  
## Chain 1: 0.597 seconds (Total)  
## Chain 1:   
##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 2).  
## Chain 2:   
## Chain 2: Gradient evaluation took 0 seconds  
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.457 seconds (Warm-up)  
## Chain 2: 0.181 seconds (Sampling)  
## Chain 2: 0.638 seconds (Total)  
## Chain 2:   
##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 3).  
## Chain 3:   
## Chain 3: Gradient evaluation took 0 seconds  
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.42 seconds (Warm-up)  
## Chain 3: 0.219 seconds (Sampling)  
## Chain 3: 0.639 seconds (Total)  
## Chain 3:   
##   
## SAMPLING FOR MODEL '9e3e0de898197cb843beae7a536602f2' NOW (CHAIN 4).  
## Chain 4:   
## Chain 4: Gradient evaluation took 0 seconds  
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.44 seconds (Warm-up)  
## Chain 4: 0.302 seconds (Sampling)  
## Chain 4: 0.742 seconds (Total)  
## Chain 4:

model\_parameters(NA\_sm\_count\_bayes, centrality = "mean")

## # Fixed effects  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## ---------------------------------------------------------------------------  
## (Intercept) | -1.63 | [-6.90, 3.53] | 72.25% | 45.82% | 1.000 | 3975.00  
## count\_sm\_p | 0.05 | [-0.02, 0.11] | 91.25% | 100% | 1.000 | 4569.00  
## NAf\_am\_p | 0.11 | [ 0.01, 0.21] | 98.38% | 100% | 0.999 | 4097.00  
## count\_sm\_p\_c | -0.01 | [-0.11, 0.08] | 61.95% | 100% | 1.000 | 3971.00  
## day\_in\_study | 0.11 | [-0.13, 0.35] | 80.75% | 100% | 1.000 | 3895.00  
##   
## # Fixed effects sigma  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -----------------------------------------------------------------------  
## sigma | 18.09 | [16.69, 19.64] | 100% | 0% | 1.000 | 5051.00

standard\_error(NA\_sm\_count\_bayes)

## Parameter SE  
## 1 b\_Intercept 2.66135978  
## 2 b\_count\_sm\_p 0.03510602  
## 3 b\_NAf\_am\_p 0.05271738  
## 4 b\_count\_sm\_p\_c 0.04809988  
## 5 b\_day\_in\_study 0.12299846  
## 6 sigma 0.74410923

## Positive Affect on SM predicting social media use

###check utility of random slopes  
model1 <- lmer(sum\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (1 | pid), data = day)  
model2 <- lmer(sum\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (SM\_Pos\_p | pid), data = day)  
  
anova(model1, model2)

## Data: day  
## Models:  
## model1: sum\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (1 | pid)  
## model2: sum\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (SM\_Pos\_p | pid)  
## npar AIC BIC logLik deviance Chisq Df Pr(>Chisq)  
## model1 6 3358.6 3382.6 -1673.3 3346.6   
## model2 8 3358.9 3390.8 -1671.4 3342.9 3.7174 2 0.1559

model3 <- lmer(count\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (1 | pid), data = day)  
model4 <- lmer(count\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (SM\_Pos\_p | pid), data = day)  
  
anova(model3, model4)

## Data: day  
## Models:  
## model3: count\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (1 | pid)  
## model4: count\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (SM\_Pos\_p | pid)  
## npar AIC BIC logLik deviance Chisq Df Pr(>Chisq)   
## model3 6 3919.7 3943.7 -1953.8 3907.7   
## model4 8 3915.1 3947.1 -1949.6 3899.1 8.5777 2 0.01372 \*  
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

#--------------------------------------------Bayesian multilevel models-------------------------------------------#  
  
## Positive affect & minutes of SM  
  
PA\_on\_SM\_day\_bayes <- brm(sum\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (1 | pid), prior = prior1, data = day)

##   
## SAMPLING FOR MODEL '30d6614209c12e6a6fe16b80a0f2de95' NOW (CHAIN 1).  
## Chain 1:   
## Chain 1: Gradient evaluation took 0 seconds  
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.551 seconds (Warm-up)  
## Chain 1: 0.222 seconds (Sampling)  
## Chain 1: 0.773 seconds (Total)  
## Chain 1:   
##   
## SAMPLING FOR MODEL '30d6614209c12e6a6fe16b80a0f2de95' NOW (CHAIN 2).  
## Chain 2:   
## Chain 2: Gradient evaluation took 0 seconds  
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.571 seconds (Warm-up)  
## Chain 2: 0.296 seconds (Sampling)  
## Chain 2: 0.867 seconds (Total)  
## Chain 2:   
##   
## SAMPLING FOR MODEL '30d6614209c12e6a6fe16b80a0f2de95' NOW (CHAIN 3).  
## Chain 3:   
## Chain 3: Gradient evaluation took 0 seconds  
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.556 seconds (Warm-up)  
## Chain 3: 0.302 seconds (Sampling)  
## Chain 3: 0.858 seconds (Total)  
## Chain 3:   
##   
## SAMPLING FOR MODEL '30d6614209c12e6a6fe16b80a0f2de95' NOW (CHAIN 4).  
## Chain 4:   
## Chain 4: Gradient evaluation took 0 seconds  
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.558 seconds (Warm-up)  
## Chain 4: 0.354 seconds (Sampling)  
## Chain 4: 0.912 seconds (Total)  
## Chain 4:

model\_parameters(PA\_on\_SM\_day\_bayes, centrality = "mean")

## # Fixed effects  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -------------------------------------------------------------------------------  
## (Intercept) | 0.09 | [-4.51, 4.61] | 51.40% | 53.42% | 0.999 | 5176.00  
## SM\_Pos\_p | 0.12 | [ 0.03, 0.21] | 99.78% | 100% | 0.999 | 5307.00  
## SM\_Pos\_p\_c | -7.78e-03 | [-0.07, 0.05] | 59.88% | 100% | 0.999 | 4945.00  
## day\_in\_study | 0.03 | [-0.14, 0.20] | 63.65% | 100% | 0.999 | 5454.00  
##   
## # Fixed effects sigma  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -----------------------------------------------------------------------  
## sigma | 15.63 | [14.54, 16.75] | 100% | 0% | 0.999 | 5842.00

standard\_error(PA\_on\_SM\_day\_bayes)

## Parameter SE  
## 1 b\_Intercept 2.30735192  
## 2 b\_SM\_Pos\_p 0.04437005  
## 3 b\_SM\_Pos\_p\_c 0.03144961  
## 4 b\_day\_in\_study 0.08637035  
## 5 sigma 0.56608141

## Positive affect & SM checks  
  
PA\_on\_SM\_count\_day\_bayes <- brm(count\_sm\_p ~ SM\_Pos\_p + SM\_Pos\_p\_c + day\_in\_study + (1 | pid), prior = prior1, data = day)

##   
## SAMPLING FOR MODEL '98206ce929ede4014e5550968c73cc2f' NOW (CHAIN 1).  
## Chain 1:   
## Chain 1: Gradient evaluation took 0 seconds  
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.449 seconds (Warm-up)  
## Chain 1: 0.227 seconds (Sampling)  
## Chain 1: 0.676 seconds (Total)  
## Chain 1:   
##   
## SAMPLING FOR MODEL '98206ce929ede4014e5550968c73cc2f' NOW (CHAIN 2).  
## Chain 2:   
## Chain 2: Gradient evaluation took 0 seconds  
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.51 seconds (Warm-up)  
## Chain 2: 0.243 seconds (Sampling)  
## Chain 2: 0.753 seconds (Total)  
## Chain 2:   
##   
## SAMPLING FOR MODEL '98206ce929ede4014e5550968c73cc2f' NOW (CHAIN 3).  
## Chain 3:   
## Chain 3: Gradient evaluation took 0 seconds  
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.501 seconds (Warm-up)  
## Chain 3: 0.265 seconds (Sampling)  
## Chain 3: 0.766 seconds (Total)  
## Chain 3:   
##   
## SAMPLING FOR MODEL '98206ce929ede4014e5550968c73cc2f' NOW (CHAIN 4).  
## Chain 4:   
## Chain 4: Gradient evaluation took 0 seconds  
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.453 seconds (Warm-up)  
## Chain 4: 0.293 seconds (Sampling)  
## Chain 4: 0.746 seconds (Total)  
## Chain 4:

model\_parameters(PA\_on\_SM\_count\_day\_bayes, centrality = "mean")

## # Fixed effects  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## --------------------------------------------------------------------------------  
## (Intercept) | -3.51 | [-12.61, 5.50] | 77.35% | 41.11% | 1.000 | 4481.00  
## SM\_Pos\_p | 0.33 | [ 0.16, 0.51] | 100% | 100% | 1.000 | 5132.00  
## SM\_Pos\_p\_c | -3.79e-03 | [ -0.13, 0.12] | 52.70% | 100% | 1.000 | 4493.00  
## day\_in\_study | 0.22 | [ -0.13, 0.57] | 88.00% | 100% | 1.000 | 5351.00  
##   
## # Fixed effects sigma  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -----------------------------------------------------------------------  
## sigma | 31.43 | [29.39, 33.64] | 100% | 0% | 1.000 | 4614.00

standard\_error(PA\_on\_SM\_count\_day\_bayes)

## Parameter SE  
## 1 b\_Intercept 4.67195966  
## 2 b\_SM\_Pos\_p 0.09162712  
## 3 b\_SM\_Pos\_p\_c 0.06389878  
## 4 b\_day\_in\_study 0.18001815  
## 5 sigma 1.09355347

## Negative Affect on SM predicting social media use

###check utility of random slopes  
model1 <- lmer(sum\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (1 | pid), data = day)  
model2 <- lmer(sum\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (SM\_Neg\_p | pid), data = day)  
  
anova(model1, model2)

## Data: day  
## Models:  
## model1: sum\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (1 | pid)  
## model2: sum\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (SM\_Neg\_p | pid)  
## npar AIC BIC logLik deviance Chisq Df Pr(>Chisq)  
## model1 6 2503.2 2525.4 -1245.6 2491.2   
## model2 8 2507.1 2536.6 -1245.6 2491.1 0.1383 2 0.9332

model3 <- lmer(count\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (1 | pid), data = day)  
model4 <- lmer(count\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (SM\_Neg\_p | pid), data = day)  
  
anova(model3, model4)

## Data: day  
## Models:  
## model3: count\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (1 | pid)  
## model4: count\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (SM\_Neg\_p | pid)  
## npar AIC BIC logLik deviance Chisq Df Pr(>Chisq)  
## model3 6 2880.9 2903.0 -1434.4 2868.9   
## model4 8 2884.9 2914.4 -1434.4 2868.9 0 2 1

#---------------------------------------------Bayesian multilevel models---------------------------------------#  
  
  
## Negative affect & minutes of SM  
  
NA\_on\_SM\_day\_bayes <- brm(sum\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (1 | pid), prior = prior1, data = day)

##   
## SAMPLING FOR MODEL 'b04d05b3371db38c3838ed849e7265f6' NOW (CHAIN 1).  
## Chain 1:   
## Chain 1: Gradient evaluation took 0 seconds  
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.351 seconds (Warm-up)  
## Chain 1: 0.231 seconds (Sampling)  
## Chain 1: 0.582 seconds (Total)  
## Chain 1:   
##   
## SAMPLING FOR MODEL 'b04d05b3371db38c3838ed849e7265f6' NOW (CHAIN 2).  
## Chain 2:   
## Chain 2: Gradient evaluation took 0 seconds  
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.418 seconds (Warm-up)  
## Chain 2: 0.237 seconds (Sampling)  
## Chain 2: 0.655 seconds (Total)  
## Chain 2:   
##   
## SAMPLING FOR MODEL 'b04d05b3371db38c3838ed849e7265f6' NOW (CHAIN 3).  
## Chain 3:   
## Chain 3: Gradient evaluation took 0 seconds  
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.329 seconds (Warm-up)  
## Chain 3: 0.154 seconds (Sampling)  
## Chain 3: 0.483 seconds (Total)  
## Chain 3:   
##   
## SAMPLING FOR MODEL 'b04d05b3371db38c3838ed849e7265f6' NOW (CHAIN 4).  
## Chain 4:   
## Chain 4: Gradient evaluation took 0 seconds  
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.382 seconds (Warm-up)  
## Chain 4: 0.249 seconds (Sampling)  
## Chain 4: 0.631 seconds (Total)  
## Chain 4:

model\_parameters(NA\_on\_SM\_day\_bayes, centrality = "mean")

## # Fixed effects  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## ---------------------------------------------------------------------------  
## (Intercept) | 3.76 | [-0.47, 7.97] | 96.03% | 14.32% | 1.000 | 4440.00  
## SM\_Neg\_p | -0.02 | [-0.14, 0.11] | 58.10% | 100% | 0.999 | 5428.00  
## SM\_Neg\_p\_c | -0.04 | [-0.22, 0.14] | 69.80% | 100% | 1.000 | 3145.00  
## day\_in\_study | -0.15 | [-0.36, 0.06] | 92.70% | 100% | 1.000 | 4094.00  
##   
## # Fixed effects sigma  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -----------------------------------------------------------------------  
## sigma | 16.60 | [15.29, 18.10] | 100% | 0% | 0.999 | 5103.00

standard\_error(NA\_on\_SM\_day\_bayes)

## Parameter SE  
## 1 b\_Intercept 2.17860278  
## 2 b\_SM\_Neg\_p 0.06509308  
## 3 b\_SM\_Neg\_p\_c 0.08835575  
## 4 b\_day\_in\_study 0.10823228  
## 5 sigma 0.71279396

## Negative affect & SM checks  
  
NA\_on\_SM\_count\_day\_bayes <- brm(count\_sm\_p ~ SM\_Neg\_p + SM\_Neg\_p\_c + day\_in\_study + (1 | pid), prior = prior1, data = day)

##   
## SAMPLING FOR MODEL '4d54ef52f606d6b4aab5c1f77bfe5a0c' NOW (CHAIN 1).  
## Chain 1:   
## Chain 1: Gradient evaluation took 0 seconds  
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.394 seconds (Warm-up)  
## Chain 1: 0.19 seconds (Sampling)  
## Chain 1: 0.584 seconds (Total)  
## Chain 1:   
##   
## SAMPLING FOR MODEL '4d54ef52f606d6b4aab5c1f77bfe5a0c' NOW (CHAIN 2).  
## Chain 2:   
## Chain 2: Gradient evaluation took 0 seconds  
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.373 seconds (Warm-up)  
## Chain 2: 0.23 seconds (Sampling)  
## Chain 2: 0.603 seconds (Total)  
## Chain 2:   
##   
## SAMPLING FOR MODEL '4d54ef52f606d6b4aab5c1f77bfe5a0c' NOW (CHAIN 3).  
## Chain 3:   
## Chain 3: Gradient evaluation took 0 seconds  
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.353 seconds (Warm-up)  
## Chain 3: 0.234 seconds (Sampling)  
## Chain 3: 0.587 seconds (Total)  
## Chain 3:   
##   
## SAMPLING FOR MODEL '4d54ef52f606d6b4aab5c1f77bfe5a0c' NOW (CHAIN 4).  
## Chain 4:   
## Chain 4: Gradient evaluation took 0 seconds  
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0 seconds.  
## 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: 0.352 seconds (Warm-up)  
## Chain 4: 0.192 seconds (Sampling)  
## Chain 4: 0.544 seconds (Total)  
## Chain 4:

model\_parameters(NA\_on\_SM\_count\_day\_bayes, centrality = "mean")

## # Fixed effects  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## ----------------------------------------------------------------------------  
## (Intercept) | 4.69 | [-3.08, 12.87] | 87.75% | 34.58% | 1.000 | 5954.00  
## SM\_Neg\_p | -0.11 | [-0.34, 0.13] | 81.62% | 100% | 1.000 | 5885.00  
## SM\_Neg\_p\_c | -0.02 | [-0.32, 0.29] | 55.25% | 100% | 1.000 | 3953.00  
## day\_in\_study | -0.24 | [-0.63, 0.15] | 87.80% | 100% | 1.000 | 6037.00  
##   
## # Fixed effects sigma  
##   
## Parameter | Mean | 95% CI | pd | % in ROPE | Rhat | ESS  
## -----------------------------------------------------------------------  
## sigma | 31.49 | [29.13, 34.11] | 100% | 0% | 1.000 | 4978.00

standard\_error(NA\_on\_SM\_count\_day\_bayes)

## Parameter SE  
## 1 b\_Intercept 4.0415998  
## 2 b\_SM\_Neg\_p 0.1194571  
## 3 b\_SM\_Neg\_p\_c 0.1557400  
## 4 b\_day\_in\_study 0.2026538  
## 5 sigma 1.2830796