

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] 30.57895
```

```
sd(Max_days$Max_day, na.rm=TRUE)
```

```
## [1] 5.620555
```

```
#min(Max_days$Max_day, na.rm=TRUE)

#View(Max_days)

#setwd("C:/Users/Missy Dreier/OneDrive - Rutgers University/Documents/Papers/2022_SMASH_Affect/Paper writing/Current Research in Ecological and Social Psychology/RR1")

#getwd()

#write.csv(Max_days, file = "Days_in_study.csv", row.names = F)

wide <- data[which(data$day_in_study==1 & data$hour_in_study==1),] # create dataset with 1 row/participant for demographics

gender <- wide %>% select("pid", "GenderBirth") # subset data to just ID and sex

totals <- day %>% group_by(pid) %>%
  dplyr::summarise(sum_sm = sum(sum_sm, na.rm = TRUE), Naf_am = mean(Naf_am, na.rm=TRUE), Naf_pm = mean(Naf_pm, na.rm=TRUE),
count_sm = sum(count_sm, na.rm = TRUE), SM_Pos = mean(SM_Pos, na.rm=TRUE), SM_Neg = mean(SM_Neg, na.rm=TRUE))

## summarize dataset

daygen <- merge(totals, gender, by = "pid") #merge

t.test(sum_sm ~ GenderBirth, data = daygen) #test sex differences in SM screen time
```



```
##  
## Welch Two Sample t-test  
##  
## data:  sum_sm by GenderBirth  
## t = 2.0984, df = 6.2206, p-value = 0.07902  
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0  
## 95 percent confidence interval:  
## -301.7959 4167.1999  
## sample estimates:  
## mean in group 0 mean in group 1  
##      3296.910      1364.208
```

```
t.test(count_sm ~ GenderBirth, data = daygen) #test sex diffs in SM checking
```

```
##  
## Welch Two Sample t-test  
##  
## data:  count_sm by GenderBirth  
## t = 0.58062, df = 12.903, p-value = 0.5715  
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0  
## 95 percent confidence interval:  
## -2518.788 4368.352  
## sample estimates:  
## mean in group 0 mean in group 1  
##      4748.167      3823.385
```

```
t.test(SM_Pos ~ GenderBirth, data = daygen) #test sex diffs in positive affect SM
```

```
##  
## Welch Two Sample t-test  
##  
## data: SM_Pos by GenderBirth  
## t = -1.516, df = 11.357, p-value = 0.1568  
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0  
## 95 percent confidence interval:  
## -43.695110 7.971083  
## sample estimates:  
## mean in group 0 mean in group 1  
## 40.71464 58.57665
```

```
t.test(SM_Neg ~ GenderBirth, data = daygen) #test sex diffs in negative affect SM
```

```
##  
## Welch Two Sample t-test  
##  
## data: SM_Neg by GenderBirth  
## t = 0.50739, df = 6.8502, p-value = 0.6278  
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0  
## 95 percent confidence interval:  
## -13.67337 21.10232  
## sample estimates:  
## mean in group 0 mean in group 1  
## 15.04517 11.33070
```

```
t.test(NAf_am ~ GenderBirth, data = daygen) #test sex diffs in general negative affect AM
```

```
##
## Welch Two Sample t-test
##
## data:  NAf_am by GenderBirth
## t = -0.7743, df = 13.35, p-value = 0.4523
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0
## 95 percent confidence interval:
##  -25.67002  12.09766
## sample estimates:
## mean in group 0 mean in group 1
##      13.81093      20.59711
```

```
t.test(NAf_pm ~ GenderBirth, data = daygen) #test sex diffs in general negative affect PM
```

```
##
## Welch Two Sample t-test
##
## data:  NAf_pm by GenderBirth
## t = -0.94029, df = 14.141, p-value = 0.3629
## alternative hypothesis: true difference in means between group 0 and group 1 is not equal to 0
## 95 percent confidence interval:
##  -26.55351  10.35672
## sample estimates:
## mean in group 0 mean in group 1
##      14.73500      22.83339
```

Models Prediciting Next morning Negative Mood

```
#-----Bayesian multilevel models-----#

## Negative mood - sumduration
NA_sm_sum_bayes <- brm(NAf_am_p ~ sum_sm_p_lag + sum_sm_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 5e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.5 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: 0.599 seconds (Warm-up)
## Chain 1:                0.255 seconds (Sampling)
## Chain 1:                0.854 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 2.2e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.22 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: 0.632 seconds (Warm-up)
## Chain 2: 0.244 seconds (Sampling)
## Chain 2: 0.876 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 4.5e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.45 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: 0.625 seconds (Warm-up)
## Chain 3: 0.278 seconds (Sampling)
## Chain 3: 0.903 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 2.8e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.28 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: 0.637 seconds (Warm-up)
## Chain 4:           0.324 seconds (Sampling)
## Chain 4:           0.961 seconds (Total)
## Chain 4:
```

```
model_parameters(NA_sm_sum_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	6.81741050	0.95	1.82712827	11.90427087	0.99725	0.006842105
b_sum_sm_p_lag	conditional	0.01844204	0.95	-0.03513926	0.07087412	0.75450	1.000000000
b_sum_sm_p_c	conditional	0.01040600	0.95	-0.03354537	0.05360783	0.67925	1.000000000
b_day_in_study	conditional	-0.47219184	0.95	-0.71243919	-0.23899901	0.99975	1.000000000
sigma	sigma	20.07128774	0.95	18.65491169	21.63035841	1.00000	0.000000000

5 rows | 1-8 of 10 columns

standard_error(NA_sm_sum_bayes)

Parameter	SE
<chr>	<dbl>
b_Intercept	2.59992754
b_sum_sm_p_lag	0.02702636
b_sum_sm_p_c	0.02254535
b_day_in_study	0.12041932
sigma	0.75378932
5 rows	

```
NA_sm_sum <- lmer(NAf_am_p ~ sum_sm_p_lag + sum_sm_p_c + day_in_study + (1 | pid), data = day)
```

```
## write function to extract standardized coefficients
stdCoef.merMod <- function(object) {
  sdy <- sd(getME(object,"y"))
  sdx <- apply(getME(object,"X"), 2, sd)
  sc <- fixef(object)*sdx/sdy
  se.fixef <- coef(summary(object))[, "Std. Error"]
  se <- se.fixef*sdx/sdy
  return(data.frame(stdcoef=sc, stdse=se))
}
```

stdCoef.merMod(NA_sm_sum)

	stdcoef	stdse
	<dbl>	<dbl>
(Intercept)	0.00000000	0.00000000
sum_sm_p_lag	0.03580871	0.05228809

	stdcoef <dbl>	stdse <dbl>
sum_sm_p_c	0.02560141	0.05271610
day_in_study	-0.20798673	0.05278313
4 rows		

Negative mood - counts

```
NA_sm_count_bayes <- brm(NAf_am_p ~ count_sm_p_lag + count_sm_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 6.4e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.64 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: 0.913 seconds (Warm-up)
## Chain 1:                0.207 seconds (Sampling)
## Chain 1:                1.12 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 2.1e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.21 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: 0.961 seconds (Warm-up)
## Chain 2: 0.309 seconds (Sampling)
## Chain 2: 1.27 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 2.7e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.27 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: 0.864 seconds (Warm-up)
## Chain 3: 0.181 seconds (Sampling)
## Chain 3: 1.045 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 2.4e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.24 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: 0.913 seconds (Warm-up)
## Chain 4:           0.278 seconds (Sampling)
## Chain 4:           1.191 seconds (Total)
## Chain 4:
```

```
model_parameters(NA_sm_count_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	7.3992248220	0.95	2.17330084	12.85665698	0.99675	0
b_count_sm_p_lag	conditional	0.0142954154	0.95	-0.01640850	0.04472145	0.82350	1
b_count_sm_p_c	conditional	-0.0004331904	0.95	-0.02275399	0.02112595	0.51625	1
b_day_in_study	conditional	-0.4596099401	0.95	-0.69814906	-0.22708383	1.00000	1
sigma	sigma	20.0371791158	0.95	18.61310164	21.56240641	1.00000	0

5 rows | 1-8 of 10 columns

```
standard_error(NA_sm_count_bayes)
```

Parameter	SE
<chr>	<dbl>
b_Intercept	2.69864973
b_count_sm_p_lag	0.01556003
b_count_sm_p_c	0.01116648
b_day_in_study	0.12043490
sigma	0.74436540
5 rows	

```
NA_sm_count <- lmer(NAf_am_p ~ count_sm_p_lag + count_sm_p_c + day_in_study + (1 | pid), data = day) # frequentist version
to extract coeffs

stdCoef.merMod(NA_sm_count)
```

	stdcoef	stdse
	<dbl>	<dbl>
(Intercept)	0.00000000	0.00000000
count_sm_p_lag	0.04688100	0.05229610
count_sm_p_c	-0.00146278	0.05213973
day_in_study	-0.20308163	0.05224681
4 rows		

Positive Affect on SM predicting social media use

```
#-----Bayesian multilevel models-----#  
  
## Positive affect & minutes of SM  
  
PA_on_SM_day_bayes <- brm(sum_sm_p ~ SM_Pos_p_lag + SM_Pos_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 7.6e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.76 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: 0.58 seconds (Warm-up)
## Chain 1:                0.343 seconds (Sampling)
## Chain 1:                0.923 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 3.5e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.35 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: 0.637 seconds (Warm-up)
## Chain 2:          0.301 seconds (Sampling)
## Chain 2:          0.938 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 2.4e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.24 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: 0.713 seconds (Warm-up)
## Chain 3:          0.379 seconds (Sampling)
## Chain 3:          1.092 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 2.4e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.24 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: 0.566 seconds (Warm-up)
## Chain 4:           0.275 seconds (Sampling)
## Chain 4:           0.841 seconds (Total)
## Chain 4:
```

```
model_parameters(PA_on_SM_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	14.85689214	0.95	3.3581271	26.5824274	0.99375	0.005526316
b_SM_Pos_p_lag	conditional	0.09248794	0.95	-0.1119780	0.3020779	0.80325	1.000000000
b_SM_Pos_p_c	conditional	-0.02139076	0.95	-0.1750787	0.1313063	0.60175	1.000000000
b_day_in_study	conditional	-0.79049650	0.95	-1.2091862	-0.3681070	1.00000	1.000000000
sigma	sigma	38.51886680	0.95	36.1016753	41.2654147	1.00000	0.000000000

5 rows | 1-8 of 10 columns

```
standard_error(PA_on_SM_day_bayes)
```

Parameter <chr>	SE <dbl>
b_Intercept	5.92622970
b_SM_Pos_p_lag	0.10596127
b_SM_Pos_p_c	0.07867866
b_day_in_study	0.21395038
sigma	1.31604605
5 rows	

```
PA_on_SM_day <- lmer(sum_sm_p ~ SM_Pos_p_lag + SM_Pos_p_c + day_in_study + (1 | pid), data = day) # run frequentist version  
to extract standardized coefficients
```

```
stdCoef.merMod(PA_on_SM_day) # standardized coefs
```



	stdcoef <dbl>	stdse <dbl>
(Intercept)	0.00000000	0.00000000
SM_Pos_p_lag	0.04440139	0.05014939
SM_Pos_p_c	-0.01412423	0.04854095
day_in_study	-0.18460457	0.05018582
4 rows		

```
## Minutes of SM --> positive mood
```

```
SM_on_PA_day_bayes <- brm(SM_Pos_p ~ sum_sm_p_lag + sum_sm_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 0.000183 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 1.83 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: 2.186 seconds (Warm-up)
## Chain 1:                0.409 seconds (Sampling)
## Chain 1:                2.595 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 4e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.4 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: 1.314 seconds (Warm-up)
## Chain 2: 0.51 seconds (Sampling)
## Chain 2: 1.824 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 3.6e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.36 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: 1.327 seconds (Warm-up)
## Chain 3: 0.543 seconds (Sampling)
## Chain 3: 1.87 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 3.3e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.33 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: 1.119 seconds (Warm-up)
## Chain 4:           0.399 seconds (Sampling)
## Chain 4:           1.518 seconds (Total)
## Chain 4:
```

```
model_parameters(SM_on_PA_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	7.13092619	0.95	3.09029260	11.20749443	0.9995	0
b_sum_sm_p_lag	conditional	0.01604665	0.95	-0.02931794	0.05997336	0.7670	1
b_sum_sm_p_c	conditional	0.00126636	0.95	-0.03335761	0.03509490	0.5320	1
b_day_in_study	conditional	-0.47964633	0.95	-0.67458916	-0.28643881	1.0000	1
sigma	sigma	17.73622431	0.95	16.55764034	19.02808934	1.0000	0

5 rows | 1-8 of 10 columns

```
standard_error(SM_on_PA_day_bayes)
```

Parameter <chr>	SE <dbl>
b_Intercept	2.07616832
b_sum_sm_p_lag	0.02247838
b_sum_sm_p_c	0.01769340
b_day_in_study	0.09820672
sigma	0.64087131
5 rows	

```
SM_on_PA_day <- lmer(SM_Pos_p ~ sum_sm_p_lag + sum_sm_p_c + day_in_study + (1 | pid), data = day) # frequentist version to extract coeffs
```

```
stdCoef.merMod(SM_on_PA_day) # std coeffs
```

	stdcoef <dbl>	stdse <dbl>
(Intercept)	0.000000000	0.00000000
sum_sm_p_lag	0.036789475	0.04922445
sum_sm_p_c	0.003812216	0.04915214
day_in_study	-0.234904114	0.04926817
4 rows		

```
## Positive affect & SM checks
```

```
PA_on_SM_count_day_bayes <- brm(count_sm_p ~ SM_Pos_p_lag + SM_Pos_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```



```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 7.7e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.77 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: 0.746 seconds (Warm-up)
## Chain 1:                0.43 seconds (Sampling)
## Chain 1:                1.176 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' 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 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: 0.762 seconds (Warm-up)
## Chain 2: 0.492 seconds (Sampling)
## Chain 2: 1.254 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 3e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.3 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: 0.816 seconds (Warm-up)
## Chain 3: 0.472 seconds (Sampling)
## Chain 3: 1.288 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 3.5e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.35 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: 0.751 seconds (Warm-up)
## Chain 4:           0.475 seconds (Sampling)
## Chain 4:           1.226 seconds (Total)
## Chain 4:
```

```
model_parameters(PA_on_SM_count_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	8.5821125	0.95	-14.97961103	31.68149482	0.76825	0.3976316
b_SM_Pos_p_lag	conditional	0.3647546	0.95	-0.04305498	0.78717810	0.95600	1.0000000
b_SM_Pos_p_c	conditional	0.1833740	0.95	-0.12860749	0.50854143	0.86600	1.0000000
b_day_in_study	conditional	-0.8906806	0.95	-1.72702689	-0.09756134	0.98550	1.0000000
sigma	sigma	76.5899521	0.95	71.74241515	81.92662940	1.00000	0.0000000

5 rows | 1-8 of 10 columns

```
standard_error(PA_on_SM_count_day_bayes)
```

Parameter <chr>	SE <dbl>
b_Intercept	11.9019911
b_SM_Pos_p_lag	0.2131571
b_SM_Pos_p_c	0.1628706
b_day_in_study	0.4216398
sigma	2.6417916
5 rows	

```
PA_on_SM_count_day <- lmer(count_sm_p ~ SM_Pos_p_lag + SM_Pos_p_c + day_in_study + (1 | pid), data = day) # frequentist version to extract coeffs
```

```
stdCoef.merMod(PA_on_SM_count_day) # std coeffs
```

	stdcoef <dbl>	stdse <dbl>
(Intercept)	0.00000000	0.00000000
SM_Pos_p_lag	0.08494567	0.05051275
SM_Pos_p_c	0.05626127	0.04889266
day_in_study	-0.10459417	0.05054945
4 rows		

```
## SM Checks --> positive mood
```

```
SM_count_on_PA_day_bayes <- brm(SM_Pos_p ~ count_sm_p_lag + count_sm_p_c + day_in_study + (1 | pid), prior = prior1, data =  
day)
```



```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 5.2e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.52 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: 1.675 seconds (Warm-up)
## Chain 1:                0.519 seconds (Sampling)
## Chain 1:                2.194 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 4.4e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.44 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: 1.448 seconds (Warm-up)
## Chain 2: 0.372 seconds (Sampling)
## Chain 2: 1.82 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 3.2e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.32 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: 1.296 seconds (Warm-up)
## Chain 3: 0.425 seconds (Sampling)
## Chain 3: 1.721 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 2.8e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.28 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: 1.196 seconds (Warm-up)
## Chain 4:           0.422 seconds (Sampling)
## Chain 4:           1.618 seconds (Total)
## Chain 4:
```

```
model_parameters(SM_count_on_PA_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	7.675894469	0.95	3.309129433	11.93895544	0.9995	0
b_count_sm_p_lag	conditional	0.029059775	0.95	0.003279141	0.05390351	0.9865	1
b_count_sm_p_c	conditional	-0.005211073	0.95	-0.023315706	0.01203765	0.7235	1
b_day_in_study	conditional	-0.471834885	0.95	-0.671002683	-0.27663280	1.0000	1
sigma	sigma	17.639018071	0.95	16.444144539	18.89589784	1.0000	0

5 rows | 1-8 of 10 columns

standard_error(SM_count_on_PA_day_bayes)

Parameter	SE
<chr>	<dbl>
b_Intercept	2.176223677
b_count_sm_p_lag	0.012915620
b_count_sm_p_c	0.009022451
b_day_in_study	0.100135175
sigma	0.624240965
5 rows	

```
SM_count_on_PA_day <- lmer(SM_Pos_p ~ count_sm_p_lag + count_sm_p_c + day_in_study + (1 | pid), data = day) # frequentist version to extract coeffs

stdCoef.merMod(SM_count_on_PA_day) # std coeffs
```

	stdcoef	stdse
	<dbl>	<dbl>
(Intercept)	0.00000000	0.00000000
count_sm_p_lag	0.11122500	0.04874298
count_sm_p_c	-0.02828832	0.04871000
day_in_study	-0.23313998	0.04865192
4 rows		

Negative Affect on SM predicting social media use

```
#-----Bayesian multilevel models-----#
```

```
## Negative affect & minutes of SM
```

```
NA_on_SM_day_bayes <- brm(sum_sm_p ~ SM_Neg_p_lag + SM_Neg_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 5.2e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.52 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: 0.702 seconds (Warm-up)
## Chain 1:                0.42 seconds (Sampling)
## Chain 1:                1.122 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 5.4e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.54 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: 0.639 seconds (Warm-up)
## Chain 2: 0.413 seconds (Sampling)
## Chain 2: 1.052 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 3.2e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.32 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: 0.646 seconds (Warm-up)
## Chain 3: 0.39 seconds (Sampling)
## Chain 3: 1.036 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 3.4e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.34 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: 0.674 seconds (Warm-up)
## Chain 4:           0.368 seconds (Sampling)
## Chain 4:           1.042 seconds (Total)
## Chain 4:
```

```
model_parameters(NA_on_SM_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	19.38707181	0.95	8.5330842	31.4028046	0.99950	0
b_SM_Neg_p_lag	conditional	-0.03401761	0.95	-0.3348122	0.2688844	0.58725	1
b_SM_Neg_p_c	conditional	0.01479522	0.95	-0.3974762	0.4311641	0.53300	1
b_day_in_study	conditional	-1.04444955	0.95	-1.5605544	-0.5337563	1.00000	1
sigma	sigma	39.39030976	0.95	36.4478930	42.6005421	1.00000	0

5 rows | 1-8 of 10 columns

```
standard_error(NA_on_SM_day_bayes)
```

Parameter <chr>	SE <dbl>
b_Intercept	5.7744487
b_SM_Neg_p_lag	0.1511133
b_SM_Neg_p_c	0.2094706
b_day_in_study	0.2636675
sigma	1.5867062
5 rows	

```
NA_on_SM_day <- lmer(sum_sm_p ~ SM_Neg_p_lag + SM_Neg_p_c + day_in_study + (1 | pid), data = day) # frequentist to get coefficients
```

```
stdCoef.merMod(NA_on_SM_day)
```

	stdcoef <dbl>	stdse <dbl>
(Intercept)	0.00000000	0.00000000
SM_Neg_p_lag	-0.01064858	0.05746790
SM_Neg_p_c	0.01121572	0.05761907
day_in_study	-0.22807151	0.05825472
4 rows		

```
## Minutes of SM --> NA
```

```
SM_on_NA_day_bayes <- brm(SM_Neg_p ~ sum_sm_p_lag + sum_sm_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 8.8e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.88 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: 1.275 seconds (Warm-up)
## Chain 1:                0.44 seconds (Sampling)
## Chain 1:                1.715 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 3.5e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.35 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: 1.197 seconds (Warm-up)
## Chain 2: 0.363 seconds (Sampling)
## Chain 2: 1.56 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 3.9e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.39 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: 1.094 seconds (Warm-up)
## Chain 3: 0.352 seconds (Sampling)
## Chain 3: 1.446 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```



```
## Chain 4: Gradient evaluation took 8e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.8 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: 1.047 seconds (Warm-up)
## Chain 4:           0.476 seconds (Sampling)
## Chain 4:           1.523 seconds (Total)
## Chain 4:
```

```
model_parameters(SM_on_NA_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	3.615897083	0.95	-0.53961067	7.87494034	0.95475	0.1502632
b_sum_sm_p_lag	conditional	-0.007785546	0.95	-0.04999027	0.03348084	0.64075	1.0000000
b_sum_sm_p_c	conditional	0.007590345	0.95	-0.02859907	0.04197817	0.67325	1.0000000
b_day_in_study	conditional	-0.260765043	0.95	-0.46427559	-0.06923394	0.99725	1.0000000
sigma	sigma	15.228580203	0.95	14.06940882	16.57080368	1.00000	0.0000000

5 rows | 1-8 of 10 columns

```
standard_error(SM_on_NA_day_bayes)
```

Parameter <chr>	SE <dbl>
b_Intercept	2.15075926
b_sum_sm_p_lag	0.02158728
b_sum_sm_p_c	0.01807335
b_day_in_study	0.10062675
sigma	0.63515757
5 rows	

```
SM_on_NA_day <- lmer(SM_Neg_p ~ sum_sm_p_lag + sum_sm_p_c + day_in_study + (1 | pid), data = day) # frequentist to get coefficients
```

```
stdCoef.merMod(SM_on_NA_day)
```

	stdcoef <dbl>	stdse <dbl>
(Intercept)	0.00000000	0.00000000
sum_sm_p_lag	-0.02138549	0.05910090
sum_sm_p_c	0.02373998	0.05899012
day_in_study	-0.14955840	0.05961875
4 rows		

```
## Negative affect & SM checks
```

```
NA_on_SM_count_day_bayes <- brm(count_sm_p ~ SM_Neg_p_lag + SM_Neg_p_c + day_in_study + (1 | pid), prior = prior1, data = day)
```

```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 7.9e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.79 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: 0.599 seconds (Warm-up)
## Chain 1:                0.547 seconds (Sampling)
## Chain 1:                1.146 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 1.9e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.19 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: 0.558 seconds (Sampling)
## Chain 2: 1.129 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 3).
## Chain 3:
## Chain 3: Gradient evaluation took 2.4e-05 seconds
## Chain 3: 1000 transitions using 10 leapfrog steps per transition would take 0.24 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: 0.584 seconds (Warm-up)
## Chain 3: 0.469 seconds (Sampling)
## Chain 3: 1.053 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 3.4e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.34 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: 0.588 seconds (Warm-up)
## Chain 4:           0.558 seconds (Sampling)
## Chain 4:           1.146 seconds (Total)
## Chain 4:
```

```
model_parameters(NA_on_SM_count_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	59.89043161	0.95	5.4477673	115.2807676	0.98500	0.006052632
b_SM_Neg_p_lag	conditional	-0.08333492	0.95	-0.6185377	0.4229375	0.62475	1.000000000
b_SM_Neg_p_c	conditional	-1.83966718	0.95	-5.3955185	1.5826267	0.86325	1.000000000
b_day_in_study	conditional	-1.71650115	0.95	-2.6345406	-0.7793919	0.99975	1.000000000
sigma	sigma	68.48084659	0.95	63.1051487	74.5044133	1.00000	0.000000000

5 rows | 1-8 of 10 columns

standard_error(NA_on_SM_count_day_bayes)

Parameter	SE
<chr>	<dbl>
b_Intercept	27.7299114
b_SM_Neg_p_lag	0.2645747
b_SM_Neg_p_c	1.7554149
b_day_in_study	0.4816120
sigma	2.9162185
5 rows	

```
NA_on_SM_count_day <- lmer(count_sm_p ~ SM_Neg_p_lag + SM_Neg_p_c + day_in_study + (1 | pid), data = day) # frequentist to get coefficients

stdCoef.merMod(NA_on_SM_count_day)
```

	stdcoef	stdse
	<dbl>	<dbl>
(Intercept)	0.00000000	0.00000000
SM_Neg_p_lag	-0.01483172	0.04995794
SM_Neg_p_c	-0.28725444	0.30098736
day_in_study	-0.19716210	0.05603780
4 rows		

```
## SM Checks --> NA
```

```
SM_count_on_NA_day_bayes <- brm(SM_Neg_p ~ count_sm_p_lag + count_sm_p_c + day_in_study + (1 | pid), prior = prior1, data =  
day)
```



```
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 1).
## Chain 1:
## Chain 1: Gradient evaluation took 5.8e-05 seconds
## Chain 1: 1000 transitions using 10 leapfrog steps per transition would take 0.58 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: 1.174 seconds (Warm-up)
## Chain 1:                0.237 seconds (Sampling)
## Chain 1:                1.411 seconds (Total)
## Chain 1:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 2).
## Chain 2:
## Chain 2: Gradient evaluation took 1.7e-05 seconds
## Chain 2: 1000 transitions using 10 leapfrog steps per transition would take 0.17 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: 0.789 seconds (Warm-up)
## Chain 2: 0.176 seconds (Sampling)
## Chain 2: 0.965 seconds (Total)
## Chain 2:
##
## SAMPLING FOR MODEL 'anon_model' 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 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: 0.942 seconds (Warm-up)
## Chain 3: 0.247 seconds (Sampling)
## Chain 3: 1.189 seconds (Total)
## Chain 3:
##
## SAMPLING FOR MODEL 'anon_model' NOW (CHAIN 4).
## Chain 4:
```

```
## Chain 4: Gradient evaluation took 2.4e-05 seconds
## Chain 4: 1000 transitions using 10 leapfrog steps per transition would take 0.24 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: 0.697 seconds (Warm-up)
## Chain 4:           0.139 seconds (Sampling)
## Chain 4:           0.836 seconds (Total)
## Chain 4:
```

```
model_parameters(SM_count_on_NA_day_bayes, centrality = "mean")
```

Parameter <chr>	Component <chr>	Mean <dbl>	CI <dbl>	CI_low <dbl>	CI_high <dbl>	pd <dbl>	ROPE_Percentage <dbl>
b_Intercept	conditional	4.0291078482	0.95	-0.45434669	8.46243604	0.96125	0.1105263
b_count_sm_p_lag	conditional	-0.0010749037	0.95	-0.02545412	0.02428477	0.53675	1.0000000
b_count_sm_p_c	conditional	-0.0008359042	0.95	-0.02009837	0.01911302	0.53375	1.0000000
b_day_in_study	conditional	-0.2467478844	0.95	-0.44453459	-0.05095965	0.99450	1.0000000
sigma	sigma	15.2193555309	0.95	14.06736921	16.50938527	1.00000	0.0000000

5 rows | 1-8 of 10 columns

standard_error(SM_count_on_NA_day_bayes)

Parameter	SE
<chr>	<dbl>
b_Intercept	2.26105309
b_count_sm_p_lag	0.01302430
b_count_sm_p_c	0.01006786
b_day_in_study	0.10011233
sigma	0.62724533
5 rows	

```
SM_count_on_NA_day <- lmer(SM_Neg_p ~ count_sm_p_lag + count_sm_p_c + day_in_study + (1 | pid), data = day) # frequentist to get coefficients

stdCoef.merMod(SM_count_on_NA_day)
```



	stdcoef	stdse
	<dbl>	<dbl>
(Intercept)	0.000000000	0.00000000
count_sm_p_lag	-0.004988639	0.05958868
count_sm_p_c	-0.006592131	0.05864592
day_in_study	-0.143915259	0.05926586
4 rows		