

Positive Affect and SM Use - SMASH Study

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Examine Variables

Negative Affect

```
## Negative mood - sumduration
```

```
NA_sm_sum <- lmer(Mood_1_pm ~ phone_applications_foreground_rapids_sumdurationsm + Mood_1_am + day_in_study, data = data)  
summary(NA_sm_sum)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [  
## lmerModLmerTest]  
## Formula: Mood_1_pm ~ phone_applications_foreground_rapids_sumdurationsm +  
##      Mood_1_am + day_in_study + (1 | pid)  
##      Data: data  
##  
## REML criterion at convergence: 50580.3  
##  
## Scaled residuals:  
##      Min       1Q   Median       3Q      Max   
## -1.8602 -0.5240 -0.1081  0.1487  4.2221   
##  
## Random effects:  
##      Groups   Name      Variance Std.Dev.  
##      pid      (Intercept) 337.9    18.38  
##      Residual             334.2    18.28  
## Number of obs: 5836, groups: pid, 17  
##  
## Fixed effects:  
##  
##              Estimate Std. Error  
## (Intercept)      1.679e+01  4.528e+00  
## phone_applications_foreground_rapids_sumdurationsm 2.369e-02  2.579e-02  
## Mood_1_am          1.088e-01  1.175e-02  
## day_in_study       1.045e-01  2.996e-02  
##  
##              df t value Pr(>|t|)  
## (Intercept)      1.665e+01   3.708 0.001801  
## phone_applications_foreground_rapids_sumdurationsm 5.821e+03   0.918 0.358518  
## Mood_1_am          5.832e+03   9.260 < 2e-16  
## day_in_study       5.828e+03   3.487 0.000493  
##
```

```

## (Intercept) **
## phone_applications_foreground_rapids_sumdurationsm
## Mood_1_am ***
## day_in_study ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##      (Intr) ph____ Md_1_m
## phn_pplc____ -0.035
## Mood_1_am    -0.077 -0.007
## day_in_std   -0.117  0.042  0.242

## Negative mood - sumduration

NA_sm_sum_test <- lmer(NAf_pm ~ sum_sm + NAf_am + day_in_study + (1 | pid), data = day)
summary(NA_sm_sum_test)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: NAf_pm ~ sum_sm + NAf_am + day_in_study + (1 | pid)
## Data: day
##
## REML criterion at convergence: 8791.5
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.3534 -0.4687 -0.1009  0.0270  4.4305
##
## Random effects:
## Groups   Name      Variance Std.Dev.
## pid      (Intercept) 61738    248.5
## Residual                206490   454.4
## Number of obs: 581, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept) 233.57731    74.21905 36.86749   3.147  0.00326 **
## sum_sm       0.14349     0.20272 567.80533   0.708  0.47934
## NAf_am       0.13173     0.04002 560.69639   3.291  0.00106 **
## day_in_study -0.68116     2.07055 570.06846  -0.329  0.74230
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##      (Intr) sum_sm NAf_am
## sum_sm      -0.303
## NAf_am      -0.246 -0.017
## day_in_std  -0.487  0.048  0.181

## Negative mood - counts

```

```
NA_sm_count <- lmer(Mood_1_pm ~ phone_applications_foreground_rapids_countsm + Mood_1_am + day_in_study
summary(NA_sm_count)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:
## Mood_1_pm ~ phone_applications_foreground_rapids_countsm + Mood_1_am +
##   day_in_study + (1 | pid)
##   Data: data
##
## REML criterion at convergence: 28573
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.9693 -0.5092 -0.1497  0.2084  4.0615
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 325.5    18.04
##   Residual                357.4    18.91
## Number of obs: 3268, groups: pid, 17
##
## Fixed effects:
##
##              Estimate Std. Error    df
## (Intercept)    1.489e+01  4.520e+00 1.735e+01
## phone_applications_foreground_rapids_countsm 6.138e-02  2.898e-02 3.254e+03
## Mood_1_am      1.226e-01  1.580e-02 3.264e+03
## day_in_study   1.733e-01  4.109e-02 3.260e+03
##
##              t value Pr(>|t|)
## (Intercept)    3.294  0.00419 **
## phone_applications_foreground_rapids_countsm  2.118  0.03424 *
## Mood_1_am      7.756 1.16e-14 ***
## day_in_study   4.216 2.55e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) ph____ Md_1_m
## phn_pplc____ -0.075
## Mood_1_am    -0.104 -0.009
## day_in_std   -0.161  0.028  0.240
```

```
NA_sm_count_test <- lmer(NAf_pm ~ count_sm + NAf_am + day_in_study + (1 | pid), data = day)
summary(NA_sm_count_test) #####Significant - # of SM checks predicts evening neg mood
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: NAf_pm ~ count_sm + NAf_am + day_in_study + (1 | pid)
##   Data: day
##
```

```
## REML criterion at convergence: 8785.7
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.4137 -0.4475 -0.1415  0.0886  4.3800
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   pid      (Intercept)    60405     245.8
##   Residual                204549    452.3
## Number of obs: 581, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)  164.89280   77.89591  41.47796   2.117  0.04032 *
## count_sm      0.52774    0.21223 293.41059   2.487  0.01345 *
## NAf_am        0.12989    0.03983 560.23556   3.261  0.00118 **
## day_in_study  -0.10120    2.07450 572.35339  -0.049  0.96111
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) cnt_sm NAf_am
## count_sm     -0.436
## NAf_am        -0.226 -0.027
## day_in_stdy   -0.499  0.125  0.177
```

#####Negative Events#####

*## Negative Event Rating * Where event occurred & minutes of SM*

```
NA_sm <- lmer(phone_applications_foreground_rapids_sumdurationsm ~ NegEventRating_1_pm*NegEventHow_pm +
summary(NA_sm)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:
## phone_applications_foreground_rapids_sumdurationsm ~ NegEventRating_1_pm *
##      NegEventHow_pm + day_in_study + (1 | pid)
##      Data: data
##
## REML criterion at convergence: 39716.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.7346 -0.5589 -0.2336  0.2034  6.7878
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   pid      (Intercept)    11.56     3.400
##   Residual                71.50     8.456
## Number of obs: 5576, groups: pid, 18
##
```

```

## Fixed effects:
##
##               Estimate Std. Error      df t value
## (Intercept)      6.21429    0.86983  20.89850    7.144
## NegEventRating_1_pm -0.15824    0.02358  5386.96875   -6.711
## NegEventHow_pm1    -0.69999    0.67830  5554.64040   -1.032
## NegEventHow_pm2    -0.38352    1.19708  5293.95683   -0.320
## NegEventHow_pm3    -7.87634    1.50585  5336.02513   -5.231
## NegEventHow_pm4      4.90026    2.13228  5563.99518    2.298
## day_in_study     -0.04282    0.01415  5558.71219   -3.026
## NegEventRating_1_pm:NegEventHow_pm1  0.16254    0.02577  5358.06555    6.307
## NegEventRating_1_pm:NegEventHow_pm2  0.16985    0.03270  5011.13411    5.193
## NegEventRating_1_pm:NegEventHow_pm3  0.25661    0.04752  5368.75322    5.400
## NegEventRating_1_pm:NegEventHow_pm4  0.11169    0.04254  5512.96328    2.626
##
##               Pr(>|t|)
## (Intercept)      4.94e-07 ***
## NegEventRating_1_pm  2.13e-11 ***
## NegEventHow_pm1      0.30212
## NegEventHow_pm2      0.74869
## NegEventHow_pm3      1.76e-07 ***
## NegEventHow_pm4      0.02159 *
## day_in_study        0.00249 **
## NegEventRating_1_pm:NegEventHow_pm1  3.06e-10 ***
## NegEventRating_1_pm:NegEventHow_pm2  2.15e-07 ***
## NegEventRating_1_pm:NegEventHow_pm3  6.95e-08 ***
## NegEventRating_1_pm:NegEventHow_pm4  0.00868 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##               (Intr) NgER_1_ NgEH_1 NgEH_2 NgEH_3 NgEH_4 dy_n_s NER_1_:NEH_1
## NgEvtntRt_1_   -0.025
## NgEvtntHw_p1   -0.097  0.042
## NgEvtntHw_p2   -0.039  0.182  0.066
## NgEvtntHw_p3   -0.049  0.195  0.109  0.185
## NgEvtntHw_p4   -0.021  0.008  0.042  0.030  0.025
## day_in_stdy    -0.280 -0.063  0.101  0.035 -0.030  0.078
## NER_1_:NEH_1    0.023 -0.922 -0.372 -0.190 -0.200 -0.023  0.033
## NER_1_:NEH_2    0.004 -0.806 -0.041 -0.677 -0.221 -0.019  0.076  0.758
## NER_1_:NEH_3    0.007 -0.596 -0.027 -0.175 -0.804  0.000  0.099  0.551
## NER_1_:NEH_4   -0.001 -0.552 -0.022 -0.126 -0.106 -0.782 -0.003  0.524
##
##               NER_1_:NEH_2 NER_1_:NEH_3
## NgEvtntRt_1_
## NgEvtntHw_p1
## NgEvtntHw_p2
## NgEvtntHw_p3
## NgEvtntHw_p4
## day_in_stdy
## NER_1_:NEH_1
## NER_1_:NEH_2
## NER_1_:NEH_3  0.515
## NER_1_:NEH_4  0.469      0.327

```

```
### collapsed across day
```

```
NA_sm_test <- lmer(sum_sm ~ NegEvent*NegEventWhere + NA_average + day_in_study + (1 | pid), data = day)
```

```
summary(NA_sm_test) # between person effect
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sum_sm ~ NegEvent * NegEventWhere + NA_average + day_in_study +
## (1 | pid)
## Data: day
##
## REML criterion at convergence: 3115.4
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.8650 -0.4788 -0.0906  0.3765  6.7489
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   pid      (Intercept)  4176      64.63
##   Residual                    4825      69.46
## Number of obs: 273, groups: pid, 18
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    135.5963    30.8169   29.3864   4.400 0.000131 ***
## NegEvent        -0.9419     0.4368  261.3687  -2.157 0.031943 *
## NegEventWhere   -10.6910    11.1312  266.8892  -0.960 0.337693
## NA_average      -0.2426     0.6802   18.3991  -0.357 0.725395
## day_in_study    -0.7526     0.5065  258.4470  -1.486 0.138561
## NegEvent:NegEventWhere  0.4659     0.2326  265.0334   2.003 0.046156 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) NgEvnt NgEvnW NA_vrg dy_n_s
## NegEvent      -0.255
## NegEventWhr   -0.467  0.565
## NA_average    -0.641 -0.065  0.020
## day_in_stdy   -0.318  0.003  0.089  0.003
## NgEvnt:NgEW   0.362 -0.884 -0.809 -0.033 -0.003
```

```
## Negative Event * Where event occurred & SM checks
```

```
NA_sm_count <- lmer(phone_applications_foreground_rapids_countsm ~ NegEventRating_1_pm*NegEventHow_pm +
summary(NA_sm_count)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: phone_applications_foreground_rapids_countsm ~ NegEventRating_1_pm *
## NegEventHow_pm + day_in_study + (1 | pid)
## Data: data
##
## REML criterion at convergence: 24735.6
```

```

##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.6368 -0.6121 -0.1734  0.3575  8.8852
##
## Random effects:
##      Groups   Name      Variance Std.Dev.
##      pid      (Intercept) 93.84    9.687
##      Residual          139.59   11.815
## Number of obs: 3171, groups: pid, 18
##
## Fixed effects:
##
##              Estimate Std. Error      df t value
## (Intercept)      15.34821    2.38579   17.96510    6.433
## NegEventRating_1_pm      -0.57444    0.50634  3145.49520   -1.135
## NegEventHow_pm1           0.07310    1.21519  3155.41662    0.060
## NegEventHow_pm2           3.30462    2.26867  3155.81873    1.457
## NegEventHow_pm3           0.68453    3.11806  3077.89691    0.220
## NegEventHow_pm4          -6.91691    4.08455  3152.99391   -1.693
## day_in_study          -0.09946    0.02633  3155.10372   -3.778
## NegEventRating_1_pm:NegEventHow_pm1    0.58099    0.50713  3145.58001    1.146
## NegEventRating_1_pm:NegEventHow_pm2    0.54149    0.50710  3145.69114    1.068
## NegEventRating_1_pm:NegEventHow_pm3    0.55646    0.51150  3146.93346    1.088
## NegEventRating_1_pm:NegEventHow_pm4    0.71744    0.51229  3146.29350    1.400
##
##              Pr(>|t|)
## (Intercept)      4.74e-06 ***
## NegEventRating_1_pm      0.256669
## NegEventHow_pm1         0.952037
## NegEventHow_pm2         0.145318
## NegEventHow_pm3         0.826246
## NegEventHow_pm4         0.090472 .
## day_in_study          0.000161 ***
## NegEventRating_1_pm:NegEventHow_pm1 0.252027
## NegEventRating_1_pm:NegEventHow_pm2 0.285689
## NegEventRating_1_pm:NegEventHow_pm3 0.276721
## NegEventRating_1_pm:NegEventHow_pm4 0.161477
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##
##      (Intr) NgER_1_ NgEH_1 NgEH_2 NgEH_3 NgEH_4 dy_n_s NER_1_:NEH_1
## NgEvntRt_1_  -0.045
## NgEvntHw_p1  -0.078  0.054
## NgEvntHw_p2  -0.014  0.019  0.048
## NgEvntHw_p3  -0.056  0.011  0.128  0.060
## NgEvntHw_p4  -0.007  0.025  0.030  0.022  0.017
## day_in_stdy  -0.192  0.168  0.157  0.007  0.013  0.075
## NER_1_:NEH_1  0.045 -0.999 -0.084 -0.021 -0.014 -0.026 -0.173
## NER_1_:NEH_2  0.043 -0.997 -0.053 -0.086 -0.014 -0.026 -0.162  0.997
## NER_1_:NEH_3  0.047 -0.989 -0.057 -0.024 -0.140 -0.025 -0.161  0.989
## NER_1_:NEH_4  0.041 -0.990 -0.050 -0.022 -0.008 -0.156 -0.173  0.989
##
##      NER_1_:NEH_2 NER_1_:NEH_3
## NgEvntRt_1_
## NgEvntHw_p1

```

```
## NgEvtHw_p2
## NgEvtHw_p3
## NgEvtHw_p4
## day_in_stdy
## NER_1_:NEH_1
## NER_1_:NEH_2
## NER_1_:NEH_3 0.987
## NER_1_:NEH_4 0.988      0.979
```

```
### collapsed across day
```

```
NA_sm_count_test <- lmer(count_sm ~ NegEvent*NegEventWhere + NA_average + day_in_study + (1 | pid), data)
summary(NA_sm_count_test)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: count_sm ~ NegEvent * NegEventWhere + NA_average + day_in_study +
##      (1 | pid)
##      Data: day
##
## REML criterion at convergence: 3134.3
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.4367 -0.6117 -0.0822  0.4077  4.3527
##
## Random effects:
##  Groups   Name                Variance Std.Dev.
##  pid      (Intercept) 20865      144.45
##  Residual                4731       68.78
## Number of obs: 273, groups: pid, 18
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   231.43557    57.56891   17.64769   4.020 0.000831 ***
## NegEvent       0.02768     0.43690   252.90784   0.063 0.949534
## NegEventWhere   5.80807    11.26464   255.93081   0.516 0.606578
## NA_average    -2.26766     1.39774    15.34869  -1.622 0.125078
## day_in_study   -0.96239     0.50479   251.68695  -1.907 0.057720 .
## NegEvent:NegEventWhere 0.01627     0.23398   254.50418   0.070 0.944613
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) NgEvtHw NgEvtW NA_vrg dy_n_s
## NegEvent      -0.141
## NegEventWhr  -0.254  0.570
## NA_average    -0.741 -0.028  0.011
## day_in_stdy   -0.168  0.004  0.092  0.000
## NgEvtHw:NgEW  0.199 -0.886 -0.813 -0.018 -0.005
```



```
## Negative Event * Who event was with & minutes of SM
```

```
NA_sm_int <- lmer(phone_applications_foreground_rapids_sumdurationsm ~ NegEventRating_1_pm*NegEventWho_1_pm, data = data)
summary(NA_sm_int)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:
## phone_applications_foreground_rapids_sumdurationsm ~ NegEventRating_1_pm *
##     NegEventWho_pm + day_in_study + (1 | pid)
## Data: data
##
## REML criterion at convergence: 39767.5
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.3200 -0.5526 -0.2450  0.1932  6.7666
##
## Random effects:
## Groups Name Variance Std.Dev.
## pid (Intercept) 10.17 3.19
## Residual 72.25 8.50
## Number of obs: 5576, groups: pid, 18
##
## Fixed effects:
##
```

	Estimate	Std. Error	df	t value
(Intercept)	6.25449	0.82600	21.63048	7.572
NegEventRating_1_pm	-0.04151	0.01165	5461.49378	-3.563
NegEventWho_pm1	-2.67252	0.84182	5004.19321	-3.175
NegEventWho_pm13	10.11484	3.77913	5276.02416	2.676
NegEventWho_pm2	-0.17908	0.76235	5563.70367	-0.235
NegEventWho_pm3	7.25906	2.05794	5565.06660	3.527
day_in_study	-0.05785	0.01425	5546.08945	-4.059
NegEventRating_1_pm:NegEventWho_pm1	0.08205	0.01948	5383.28368	4.212
NegEventRating_1_pm:NegEventWho_pm2	0.04164	0.01584	5551.64170	2.629
NegEventRating_1_pm:NegEventWho_pm3	-0.06822	0.03719	5565.88722	-1.834

```
## Pr(>|t|)
## (Intercept) 1.62e-07 ***
## NegEventRating_1_pm 0.000369 ***
## NegEventWho_pm1 0.001509 **
## NegEventWho_pm13 0.007463 **
## NegEventWho_pm2 0.814293
## NegEventWho_pm3 0.000423 ***
## day_in_study 4.99e-05 ***
## NegEventRating_1_pm:NegEventWho_pm1 2.57e-05 ***
## NegEventRating_1_pm:NegEventWho_pm2 0.008586 **
## NegEventRating_1_pm:NegEventWho_pm3 0.066638 .
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) NgER_1_ NgEW_1 NEW_13 NgEW_2 NgEW_3 dy_n_s NER_1_:NEW_1
```

```
## NgEvtRt_1_ -0.067
## NgEvtWh_p1 -0.094 0.109
## NgEvtWh_13 -0.034 -0.222 -0.017
## NgEvtWh_p2 -0.092 0.025 0.095 0.013
## NgEvtWh_p3 -0.003 0.009 0.065 -0.004 0.016
## day_in_stdy -0.303 0.018 0.105 0.033 0.093 -0.008
## NER_1_:NEW_1 0.036 -0.623 -0.739 0.144 -0.029 -0.038 0.014
## NER_1_:NEW_2 0.050 -0.715 -0.132 0.169 -0.632 -0.026 -0.059 0.485
## NER_1_:NEW_3 -0.011 -0.303 -0.022 0.074 0.017 -0.890 0.030 0.194
## NER_1_:NEW_2
## NgEvtRt_1_
## NgEvtWh_p1
## NgEvtWh_13
## NgEvtWh_p2
## NgEvtWh_p3
## day_in_stdy
## NER_1_:NEW_1
## NER_1_:NEW_2
## NER_1_:NEW_3 0.229
## fit warnings:
## fixed-effect model matrix is rank deficient so dropping 1 column / coefficient
```

```
### collapsed across day, within person only
```

```
NA_sm_int_test <- lmer(sum_sm ~ NegEvent*NegEventWho + NA_average + day_in_study + (1 | pid), data = day)
summary(NA_sm_int_test)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sum_sm ~ NegEvent * NegEventWho + NA_average + day_in_study +
## (1 | pid)
## Data: day
##
## REML criterion at convergence: 3122.2
##
## Scaled residuals:
## Min 1Q Median 3Q Max
## -2.7695 -0.4992 -0.1074 0.3489 6.7960
##
## Random effects:
## Groups Name Variance Std.Dev.
## pid (Intercept) 4426 66.53
## Residual 4896 69.97
## Number of obs: 273, groups: pid, 18
##
## Fixed effects:
## Estimate Std. Error df t value Pr(>|t|)
## (Intercept) 121.70057 29.27848 21.79692 4.157 0.000418 ***
## NegEvent -0.24532 0.37132 259.14996 -0.661 0.509421
## NegEventWho 1.91054 6.34671 256.65091 0.301 0.763637
## NA_average -0.21105 0.69755 17.79828 -0.303 0.765734
## day_in_study -0.85446 0.50917 257.90604 -1.678 0.094527 .
## NegEvent:NegEventWho 0.03297 0.11807 258.85562 0.279 0.780308
```

```

## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##      (Intr) NgEvt NgEvnW NA_vrg dy_n_s
## NegEvent      -0.139
## NegEventWho  -0.300  0.329
## NA_average   -0.678 -0.098 -0.024
## day_in_stdy  -0.323  0.148  0.101  0.004
## NgEvt:NgEW   0.249 -0.784 -0.762  0.000 -0.131

## Negative Event * Who event was with & SM checks

NA_sm_count_int <- lmer(phone_applications_foreground_rapids_countsm ~ NegEventRating_1_pm*NegEventWho_
summary(NA_sm_count_int)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: phone_applications_foreground_rapids_countsm ~ NegEventRating_1_pm *
##      NegEventWho_pm + day_in_study + (1 | pid)
##      Data: data
##
## REML criterion at convergence: 24735.1
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.6314 -0.6116 -0.1736  0.3607  8.9022
##
## Random effects:
##      Groups      Name      Variance Std.Dev.
##      pid      (Intercept)  95.06     9.75
##      Residual             139.47    11.81
## Number of obs: 3171, groups: pid, 18
##
## Fixed effects:
##
##              Estimate Std. Error      df t value
## (Intercept)    15.10938    2.39789   17.85913    6.301
## NegEventRating_1_pm    -0.01575    0.02843  3157.93404   -0.554
## NegEventWho_pm1         2.10447    1.52938  3127.04876    1.376
## NegEventWho_pm13       -0.48312    5.72953  3154.70988   -0.084
## NegEventWho_pm2       -1.35980    1.35711  3151.02057   -1.002
## NegEventWho_pm3       -1.54536    3.87445  3148.43620   -0.399
## day_in_study       -0.08250    0.02618  3158.57999   -3.152
## NegEventRating_1_pm:NegEventWho_pm1    0.01462    0.03869  3160.17748    0.378
## NegEventRating_1_pm:NegEventWho_pm2    0.03622    0.03442  3154.00338    1.052
## NegEventRating_1_pm:NegEventWho_pm3    0.07130    0.07222  3149.93273    0.987
##
##              Pr(>|t|)
## (Intercept)    6.35e-06 ***
## NegEventRating_1_pm    0.57981
## NegEventWho_pm1       0.16891
## NegEventWho_pm13      0.93281
## NegEventWho_pm2       0.31643
## NegEventWho_pm3       0.69003

```

```

## day_in_study 0.00164 **
## NegEventRating_1_pm:NegEventWho_pm1 0.70553
## NegEventRating_1_pm:NegEventWho_pm2 0.29268
## NegEventRating_1_pm:NegEventWho_pm3 0.32358
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##      (Intr) NgER_1_ NgEW_1 NEW_13 NgEW_2 NgEW_3 dy_n_s NER_1_:NEW_1
## NgEvtntRt_1_ -0.038
## NgEvtntWh_p1 -0.069 0.019
## NgEvtntWh_13 -0.023 -0.365 0.002
## NgEvtntWh_p2 -0.062 0.019 0.093 0.031
## NgEvtntWh_p3 -0.005 0.004 0.074 -0.003 0.010
## day_in_stdy -0.192 0.076 0.141 0.015 0.123 0.001
## NER_1_:NEW_1 0.032 -0.718 -0.612 0.269 -0.024 -0.035 -0.061
## NER_1_:NEW_2 0.038 -0.823 -0.065 0.303 -0.513 -0.015 -0.127 0.623
## NER_1_:NEW_3 -0.002 -0.390 0.003 0.149 0.016 -0.862 0.002 0.282
##      NER_1_:NEW_2
## NgEvtntRt_1_
## NgEvtntWh_p1
## NgEvtntWh_13
## NgEvtntWh_p2
## NgEvtntWh_p3
## day_in_stdy
## NER_1_:NEW_1
## NER_1_:NEW_2
## NER_1_:NEW_3 0.325
## fit warnings:
## fixed-effect model matrix is rank deficient so dropping 1 column / coefficient

```

```

### collapsed across day, wihtin person only

```

```

NA_sm_count_int_test <- lmer(count_sm ~ NegEvent*NegEventWho + NA_average + day_in_study + (1 | pid), data = day_data)
summary(NA_sm_count_int_test)

```

```

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: count_sm ~ NegEvent * NegEventWho + NA_average + day_in_study +
##      (1 | pid)
##      Data: day
##
## REML criterion at convergence: 3135.9
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.4835 -0.5794 -0.0796  0.3970  4.3179
##
## Random effects:
##      Groups      Name      Variance Std.Dev.
##      pid      (Intercept) 20385    142.78
##      Residual              4724     68.73
## Number of obs: 273, groups:  pid, 18

```

```

##
## Fixed effects:
##           Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    246.63882    55.75002   16.28911    4.424 0.000409 ***
## NegEvent         0.33781     0.36746  252.24078    0.919 0.358803
## NegEventWho     -5.79060     6.26519  251.46826   -0.924 0.356242
## NA_average      -2.22561     1.38219   15.38065   -1.610 0.127679
## day_in_study    -1.04091     0.50314  251.74453   -2.069 0.039584 *
## NegEvent:NegEventWho  0.01097     0.11679  252.07394    0.094 0.925211
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##           (Intr) NgEvtnt NgEvtW NA_vrg dy_n_s
## NegEvent      -0.071
## NegEventWho  -0.155  0.328
## NA_average    -0.752 -0.050 -0.012
## day_in_stdy   -0.165  0.152  0.099  0.001
## NgEvtnt:NgEW  0.128 -0.786 -0.760  0.002 -0.134
#####Negative Affect During SM Use#####

## Negitive affect & minutes of SM

NA_on_SM <- lmer(phone_applications_foreground_rapids_sumdurationsm ~ SMNeg_1_pm + day_in_study + (1 | pid))
summary(NA_on_SM)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: phone_applications_foreground_rapids_sumdurationsm ~ SMNeg_1_pm +
##           day_in_study + (1 | pid)
##           Data: data
##
## REML criterion at convergence: 42732.6
##
## Scaled residuals:
##           Min           1Q       Median           3Q            Max
## -1.3687 -0.5419 -0.2535  0.1746  6.7382
##
## Random effects:
##           Groups      Name      Variance Std.Dev.
##           pid      (Intercept)  9.124    3.021
##           Residual              73.491    8.573
## Number of obs: 5979, groups: pid, 18
##
## Fixed effects:
##           Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)  5.942e+00  7.680e-01  2.006e+01    7.737 1.91e-07 ***
## SMNeg_1_pm    5.543e-03  7.308e-03  5.643e+03    0.758 0.448214
## day_in_study -5.135e-02  1.382e-02  5.913e+03   -3.717 0.000204 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
## Correlation of Fixed Effects:
##           (Intr) SMN_1_
## SMNeg_1_pm  -0.173
## day_in_stdy -0.287  0.186

### collapsed across day, wihtin person only

NA_on_SM_test <- lmer(sum_sm ~ SM_Neg + NA_sm_average + day_in_study + (1 | pid), data = day)

summary(NA_on_SM_test)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sum_sm ~ SM_Neg + NA_sm_average + day_in_study + (1 | pid)
## Data: day
##
## REML criterion at convergence: 3354.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.8056 -0.4714 -0.1259  0.3859  7.0294
##
## Random effects:
## Groups   Name            Variance Std.Dev.
## pid      (Intercept) 4342      65.89
## Residual                4731      68.78
## Number of obs: 294, groups: pid, 18
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)  119.7818   25.4241  18.2073  4.711 0.000169 ***
## SM_Neg        0.2189    0.2665 273.5237  0.821 0.412092
## NA_sm_average -0.3777    1.4099  15.7415 -0.268 0.792256
## day_in_study  -0.8991    0.4926 281.7229 -1.825 0.069002 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##           (Intr) SM_Neg NA_sm_
## SM_Neg      -0.042
## NA_sm_averg -0.686 -0.194
## day_in_stdy -0.263  0.160 -0.059

## Negative affect & SM checks

NA_on_SM_count <- lmer(phone_applications_foreground_rapids_countsm ~ SMNeg_1_pm + day_in_study + (1 | pid), data = day)

summary(NA_on_SM_count)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:

```

```
## phone_applications_foreground_rapids_countsm ~ SMNeg_1_pm + day_in_study +
## (1 | pid)
## Data: data
##
## REML criterion at convergence: 26428.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.1775 -0.6042 -0.1842  0.3537  9.0808
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 63.22    7.951
##   Residual                136.89   11.700
## Number of obs: 3397, groups: pid, 18
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)  13.80326    1.96344   18.59800    7.030 1.22e-06 ***
## SMNeg_1_pm     0.01849    0.01373  3387.28700    1.347  0.17798
## day_in_study  -0.06882    0.02516  3393.95724   -2.735  0.00626 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) SMN_1_
## SMNeg_1_pm  -0.131
## day_in_std  -0.210  0.222
```

collapsed across day, wihtin person only

```
NA_on_SM_count_test <- lmer(count_sm ~ SM_Neg + NA_sm_average + day_in_study + (1 | pid), data = day)
summary(NA_on_SM_count_test)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: count_sm ~ SM_Neg + NA_sm_average + day_in_study + (1 | pid)
## Data: day
##
## REML criterion at convergence: 3375.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.5359 -0.6346 -0.1120  0.4154  4.4260
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 19013    137.89
##   Residual                4712     68.64
## Number of obs: 294, groups: pid, 18
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
```

```
## (Intercept) 192.0153 48.8954 16.1892 3.927 0.00118 **
## SM_Neg 0.4727 0.2660 273.2928 1.777 0.07663 .
## NA_sm_average -2.7512 2.7926 15.4622 -0.985 0.33971
## day_in_study -0.7776 0.4947 275.5329 -1.572 0.11712
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) SM_Neg NA_sm_
## SM_Neg -0.022
## NA_sm_aver -0.718 -0.098
## day_in_std -0.136 0.161 -0.030
```

Positive Affect

```
#####Positive Events#####
## Positive Event Rating * Where event occurred & minutes of SM
PA_sm <- lmer(phone_applications_foreground_rapids_sumdurationsm ~ PosEventRating_1_pm*PosEventHow_pm +
summary(PA_sm)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:
## phone_applications_foreground_rapids_sumdurationsm ~ PosEventRating_1_pm *
## PosEventHow_pm + day_in_study + (1 | pid)
## Data: data
##
## REML criterion at convergence: 58965
##
## Scaled residuals:
## Min 1Q Median 3Q Max
## -1.8355 -0.4389 -0.2109 0.1156 5.6013
##
## Random effects:
## Groups Name Variance Std.Dev.
## pid (Intercept) 17.31 4.16
## Residual 102.77 10.14
## Number of obs: 7880, groups: pid, 19
##
## Fixed effects:
## Estimate Std. Error df t value
## (Intercept) 5.625e+00 1.066e+00 2.589e+01 5.277
## PosEventRating_1_pm 1.755e-02 2.431e-02 7.867e+03 0.722
## PosEventHow_pm1 1.564e+00 8.765e-01 7.869e+03 1.785
## PosEventHow_pm2 5.391e-04 1.273e+00 7.866e+03 0.000
## PosEventHow_pm3 5.631e+00 1.890e+00 7.856e+03 2.980
## PosEventHow_pm4 -6.574e+00 3.087e+00 5.962e+03 -2.130
## day_in_study -1.788e-02 1.410e-02 7.863e+03 -1.268
## PosEventRating_1_pm:PosEventHow_pm1 -4.167e-02 2.621e-02 7.868e+03 -1.590
## PosEventRating_1_pm:PosEventHow_pm2 -1.087e-02 3.031e-02 7.856e+03 -0.359
```



```
## PosEventRating_1_pm:PosEventHow_pm3 -8.839e-02 3.367e-02 7.862e+03 -2.625
## PosEventRating_1_pm:PosEventHow_pm4 1.028e-01 4.676e-02 5.942e+03 2.198
## Pr(>|t|)
## (Intercept) 1.64e-05 ***
## PosEventRating_1_pm 0.47049
## PosEventHow_pm1 0.07435 .
## PosEventHow_pm2 0.99966
## PosEventHow_pm3 0.00289 **
## PosEventHow_pm4 0.03324 *
## day_in_study 0.20474
## PosEventRating_1_pm:PosEventHow_pm1 0.11191
## PosEventRating_1_pm:PosEventHow_pm2 0.71996
## PosEventRating_1_pm:PosEventHow_pm3 0.00868 **
## PosEventRating_1_pm:PosEventHow_pm4 0.02802 *
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
## (Intr) PsER_1_ PsEH_1 PsEH_2 PsEH_3 PsEH_4 dy_n_s PER_1_:PEH_1
## PsEvntRt_1_ -0.058
## PsEvntHw_p1 -0.115 0.042
## PsEvntHw_p2 -0.067 0.036 0.118
## PsEvntHw_p3 -0.039 0.022 0.122 0.080
## PsEvntHw_p4 -0.018 0.023 0.044 0.019 0.072
## day_in_stdy -0.265 -0.027 0.117 0.022 -0.011 0.027
## PER_1_:PEH_1 0.034 -0.913 -0.404 -0.044 -0.050 -0.021 0.023
## PER_1_:PEH_2 0.024 -0.799 -0.053 -0.566 -0.035 -0.009 0.031 0.740
## PER_1_:PEH_3 0.007 -0.716 -0.072 -0.050 -0.686 -0.051 0.072 0.681
## PER_1_:PEH_4 -0.002 -0.523 -0.030 -0.015 -0.059 -0.838 0.013 0.482
## PER_1_:PEH_2 PER_1_:PEH_3
## PsEvntRt_1_
## PsEvntHw_p1
## PsEvntHw_p2
## PsEvntHw_p3
## PsEvntHw_p4
## day_in_stdy
## PER_1_:PEH_1
## PER_1_:PEH_2
## PER_1_:PEH_3 0.590
## PER_1_:PEH_4 0.416 0.413
```

```
### collapsed across day
```

```
PA_sm_test <- lmer(sum_sm ~ PosEvent*PosEventWhere + PA_average + day_in_study + (1 | pid), data = day)
```

```
summary(PA_sm_test) # between person effect
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sum_sm ~ PosEvent * PosEventWhere + PA_average + day_in_study +
## (1 | pid)
## Data: day
##
## REML criterion at convergence: 5386.8
##
```

```

## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.2226 -0.3747 -0.0801  0.2777  4.1556
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 5869     76.61
##   Residual              9551     97.73
## Number of obs: 449, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    121.055940   45.793246   24.467478    2.644  0.0141 *
## PosEvent       -0.185568    0.380699  436.916486   -0.487  0.6262
## PosEventWhere2  11.853166   25.106235  424.645036    0.472  0.6371
## PosEventWhere3  -6.456011   38.026756  423.793135   -0.170  0.8653
## PosEventWhere4  58.510117   49.039384  432.308587    1.193  0.2335
## PosEventWhere5 -28.783982   71.569187  436.258900   -0.402  0.6877
## PA_average     -0.005109    0.036627   18.274774   -0.139  0.8906
## day_in_study   -0.304728    0.557186  427.349979   -0.547  0.5847
## PosEvent:PosEventWhere2 -0.275763    0.589392  427.637617   -0.468  0.6401
## PosEvent:PosEventWhere3  0.360848    1.011894  430.329731    0.357  0.7216
## PosEvent:PosEventWhere4 -1.156640    1.131692  432.604973   -1.022  0.3073
## PosEvent:PosEventWhere5  1.715284    1.694736  429.747453    1.012  0.3120
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) PsEvtnt PsEvW2 PsEvW3 PsEvW4 PsEvW5 PA_vrg dy_n_s PE:PEW2
## PosEvent      -0.360
## PosEvtntWhr2  -0.196  0.320
## PosEvtntWhr3  -0.106  0.225  0.228
## PosEvtntWhr4  -0.129  0.187  0.207  0.143
## PosEvtntWhr5  -0.109  0.126  0.122  0.075  0.139
## PA_average    -0.816  0.089 -0.019 -0.034  0.021  0.020
## day_in_stdy   -0.235  0.158  0.184  0.058  0.039  0.042 -0.031
## PsEvtnt:PEW2  0.221 -0.538 -0.824 -0.144 -0.150 -0.070 -0.088 -0.122
## PsEvtnt:PEW3  0.074 -0.313 -0.132 -0.799 -0.074 -0.016  0.005 -0.034  0.190
## PsEvtnt:PEW4  0.146 -0.297 -0.129 -0.087 -0.904 -0.094 -0.105  0.014  0.219
## PsEvtnt:PEW5  0.099 -0.179 -0.077 -0.044 -0.104 -0.905 -0.047 -0.023  0.106
##              PE:PEW3 PE:PEW4
## PosEvent
## PosEvtntWhr2
## PosEvtntWhr3
## PosEvtntWhr4
## PosEvtntWhr5
## PA_average
## day_in_stdy
## PsEvtnt:PEW2
## PsEvtnt:PEW3
## PsEvtnt:PEW4  0.112
## PsEvtnt:PEW5  0.044  0.129

```

```
## Positive Event * Where event occurred & SM checks
```

```
PA_sm_count <- lmer(phone_applications_foreground_rapids_countsm ~ PosEventRating_1_pm*PosEventHow_pm +
summary(PA_sm_count)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: phone_applications_foreground_rapids_countsm ~ PosEventRating_1_pm *
##      PosEventHow_pm + day_in_study + (1 | pid)
##      Data: data
##
## REML criterion at convergence: 32323.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.9066 -0.5615 -0.1771  0.3095  9.1078
##
## Random effects:
##      Groups      Name      Variance Std.Dev.
##      pid      (Intercept)  48.86     6.99
##      Residual              137.81    11.74
## Number of obs: 4152, groups: pid, 19
##
## Fixed effects:
##
##              Estimate Std. Error      df t value
## (Intercept)    12.73565    1.76730   23.88979    7.206
## PosEventRating_1_pm
##              -0.02414    0.03314  4131.24494   -0.728
## PosEventHow_pm1
##              -1.16674    1.32703  4136.97442   -0.879
## PosEventHow_pm2
##              -0.23269    1.82990  4137.41397   -0.127
## PosEventHow_pm3
##               4.48210    3.05384  4140.91746    1.468
## PosEventHow_pm4
##              -1.88910    4.93786  3626.00917   -0.383
## day_in_study
##              -0.05106    0.02259  4140.99977   -2.260
## PosEventRating_1_pm:PosEventHow_pm1
##               0.02832    0.03645  4133.35949    0.777
## PosEventRating_1_pm:PosEventHow_pm2
##               0.04643    0.04212  4140.25198    1.102
## PosEventRating_1_pm:PosEventHow_pm3
##              -0.02796    0.05081  4140.96779   -0.550
## PosEventRating_1_pm:PosEventHow_pm4
##               0.11531    0.07553  3464.64768    1.527
##
##              Pr(>|t|)
## (Intercept)    1.96e-07 ***
## PosEventRating_1_pm
##              0.4665
## PosEventHow_pm1
##              0.3793
## PosEventHow_pm2
##              0.8988
## PosEventHow_pm3
##              0.1423
## PosEventHow_pm4
##              0.7021
## day_in_study
##              0.0239 *
## PosEventRating_1_pm:PosEventHow_pm1
##              0.4372
## PosEventRating_1_pm:PosEventHow_pm2
##              0.2703
## PosEventRating_1_pm:PosEventHow_pm3
##              0.5822
## PosEventRating_1_pm:PosEventHow_pm4
##              0.1269
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
```

```
##          (Intr) PsER_1_ PsEH_1 PsEH_2 PsEH_3 PsEH_4 dy_n_s PER_1_:PEH_1
## PsEvtRt_1_ -0.053
## PsEvtHw_p1 -0.100  0.039
## PsEvtHw_p2 -0.063  0.037  0.116
## PsEvtHw_p3 -0.026  0.019  0.107  0.082
## PsEvtHw_p4 -0.008  0.024  0.036  0.019  0.046
## day_in_stdy -0.255 -0.024  0.135  0.037 -0.009  0.024
## PER_1_:PEH_1  0.031 -0.892 -0.444 -0.046 -0.048 -0.020  0.013
## PER_1_:PEH_2  0.022 -0.783 -0.054 -0.584 -0.039 -0.012  0.023  0.712
## PER_1_:PEH_3 -0.001 -0.646 -0.061 -0.052 -0.747 -0.033  0.068  0.603
## PER_1_:PEH_4 -0.010 -0.444 -0.022 -0.015 -0.036 -0.873  0.008  0.397
##          PER_1_:PEH_2 PER_1_:PEH_3
## PsEvtRt_1_
## PsEvtHw_p1
## PsEvtHw_p2
## PsEvtHw_p3
## PsEvtHw_p4
## day_in_stdy
## PER_1_:PEH_1
## PER_1_:PEH_2
## PER_1_:PEH_3  0.527
## PER_1_:PEH_4  0.347          0.307
```

collapsed across day

```
PA_sm_count_test <- lmer(count_sm ~ PosEvent*PosEventWhere + PA_average + day_in_study + (1 | pid), data)
summary(PA_sm_count_test)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: count_sm ~ PosEvent * PosEventWhere + PA_average + day_in_study +
##          (1 | pid)
##          Data: day
##
## REML criterion at convergence: 5087.5
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.9550 -0.5783 -0.0932  0.4157  4.8331
##
## Random effects:
##  Groups   Name                Variance Std.Dev.
##  pid      (Intercept) 12591      112.21
##  Residual                4554       67.48
## Number of obs: 449, groups:  pid, 19
##
## Fixed effects:
##              Estimate Std. Error    df t value Pr(>|t|)
## (Intercept)   247.41926   60.23362  18.33375    4.108 0.000639 ***
## PosEvent       0.03207    0.26711 427.24339    0.120 0.904484
## PosEventWhere2 -18.02555   17.37608 420.74813   -1.037 0.300156
## PosEventWhere3 -20.17938   26.30666 420.50793   -0.767 0.443463
## PosEventWhere4  18.41689   34.11178 423.38215    0.540 0.589551
```

```

## PosEventWhere5          39.20800    50.04036 426.01608    0.784 0.433753
## PA_average              -0.08662     0.05096 16.89365   -1.700 0.107515
## day_in_study            -0.52254     0.38623 421.59823   -1.353 0.176807
## PosEvent:PosEventWhere2 -0.02508     0.40861 421.63538   -0.061 0.951095
## PosEvent:PosEventWhere3  0.86846     0.70293 422.79958    1.235 0.217332
## PosEvent:PosEventWhere4 -0.53675     0.78725 423.31131   -0.682 0.495740
## PosEvent:PosEventWhere5 -0.45307     1.17680 422.59331   -0.385 0.700431
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##      (Intr) PsEvtnt PsEvW2 PsEvW3 PsEvW4 PsEvW5 PA_vrg dy_n_s PE:PEW2
## PosEvent      -0.192
## PosEvtntWhr2 -0.102  0.313
## PosEvtntWhr3 -0.056  0.223  0.228
## PosEvtntWhr4 -0.068  0.181  0.208  0.145
## PosEvtntWhr5 -0.058  0.118  0.122  0.075  0.147
## PA_average   -0.875  0.045 -0.010 -0.017  0.010  0.010
## day_in_stdy  -0.124  0.162  0.182  0.058  0.033  0.037 -0.015
## PsEvtnt:PEW2  0.117 -0.535 -0.823 -0.145 -0.149 -0.066 -0.043 -0.123
## PsEvtnt:PEW3  0.038 -0.313 -0.132 -0.795 -0.073 -0.012  0.003 -0.038  0.192
## PsEvtnt:PEW4  0.077 -0.291 -0.130 -0.089 -0.903 -0.097 -0.053  0.017  0.217
## PsEvtnt:PEW5  0.053 -0.173 -0.077 -0.045 -0.111 -0.905 -0.024 -0.020  0.103
##      PE:PEW3 PE:PEW4
## PosEvent
## PosEvtntWhr2
## PosEvtntWhr3
## PosEvtntWhr4
## PosEvtntWhr5
## PA_average
## day_in_stdy
## PsEvtnt:PEW2
## PsEvtnt:PEW3
## PsEvtnt:PEW4  0.112
## PsEvtnt:PEW5  0.041  0.132

```

```
## Positive Event * Who event was with & minutes of SM
```

```

PA_sm_int <- lmer(phone_applications_foreground_rapids_sumdurationsm ~ PosEventRating_1_pm*PosEventWho_pm, data = data)
summary(PA_sm_int)

```

```

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:
## phone_applications_foreground_rapids_sumdurationsm ~ PosEventRating_1_pm *
##   PosEventWho_pm + day_in_study + (1 | pid)
## Data: data
##
## REML criterion at convergence: 58760.3
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.8311 -0.4401 -0.1878  0.1200  5.6235

```

```
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 16.61    4.075
##   Residual                102.52   10.125
## Number of obs: 7856, groups: pid, 19
##
## Fixed effects:
##               Estimate Std. Error      df t value
## (Intercept)      5.464e+00  1.051e+00  2.754e+01   5.197
## PosEventRating_1_pm -8.559e-02  1.783e-02  7.837e+03  -4.800
## PosEventWho_pm1      5.766e-01  8.314e-01  7.832e+03   0.694
## PosEventWho_pm12     1.885e+01  5.799e+00  7.839e+03   3.251
## PosEventWho_pm123    2.688e+01  9.367e+00  7.834e+03   2.870
## PosEventWho_pm13     9.648e+00  4.812e+00  7.838e+03   2.005
## PosEventWho_pm2      1.330e+00  1.207e+00  7.840e+03   1.101
## PosEventWho_pm3     -1.297e+00  7.023e+00  7.828e+03  -0.185
## day_in_study        3.593e-03  1.430e-02  7.839e+03   0.251
## PosEventRating_1_pm:PosEventWho_pm1  7.685e-02  1.987e-02  7.839e+03   3.868
## PosEventRating_1_pm:PosEventWho_pm12 -1.204e-01  6.843e-02  7.840e+03  -1.759
## PosEventRating_1_pm:PosEventWho_pm123 -2.624e-01  1.028e-01  7.834e+03  -2.552
## PosEventRating_1_pm:PosEventWho_pm13 -2.713e-02  5.862e-02  7.837e+03  -0.463
## PosEventRating_1_pm:PosEventWho_pm2   7.615e-02  2.307e-02  7.841e+03   3.301
## PosEventRating_1_pm:PosEventWho_pm3   9.488e-02  8.163e-02  7.827e+03   1.162
##               Pr(>|t|)
## (Intercept)      1.70e-05 ***
## PosEventRating_1_pm 1.62e-06 ***
## PosEventWho_pm1    0.487948
## PosEventWho_pm12   0.001153 **
## PosEventWho_pm123  0.004118 **
## PosEventWho_pm13   0.045021 *
## PosEventWho_pm2    0.270838
## PosEventWho_pm3    0.853464
## day_in_study      0.801609
## PosEventRating_1_pm:PosEventWho_pm1  0.000111 ***
## PosEventRating_1_pm:PosEventWho_pm12 0.078638 .
## PosEventRating_1_pm:PosEventWho_pm123 0.010742 *
## PosEventRating_1_pm:PosEventWho_pm13 0.643446
## PosEventRating_1_pm:PosEventWho_pm2   0.000967 ***
## PosEventRating_1_pm:PosEventWho_pm3   0.245110
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
### collapsed across day, within person only
```

```
PA_sm_int_test <- lmer(sum_sm ~ PosEvent*PosEventWho + PA_average + day_in_study + (1 | pid), data = day)
summary(PA_sm_int_test)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sum_sm ~ PosEvent * PosEventWho + PA_average + day_in_study +
## (1 | pid)
## Data: day
```

```
##
## REML criterion at convergence: 5337.6
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.1991 -0.3488 -0.0798  0.2587  4.1520
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 6208     78.79
##   Residual             9486     97.40
## Number of obs: 448, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    123.41116    46.75668   24.57561    2.639   0.0142 *
## PosEvent        -0.30558     0.38186  431.97822   -0.800   0.4240
## PosEventWho2     -0.79667    24.71137  421.60582   -0.032   0.9743
## PosEventWho3     218.92015   138.12977  417.23591    1.585   0.1137
## PosEventWho4     219.47581   207.11647  417.05700    1.060   0.2899
## PosEventWho5      95.14550   116.66114  417.32565    0.816   0.4152
## PosEventWho6      20.82522    33.35178  422.23197    0.624   0.5327
## PosEventWho7    -35.90440   168.98554  416.24993   -0.212   0.8318
## PA_average       -0.01328     0.03721   17.98035   -0.357   0.7253
## day_in_study     -0.05049     0.56301  422.31893   -0.090   0.9286
## PosEvent:PosEventWho2  0.24777    0.57696  420.78121    0.429   0.6678
## PosEvent:PosEventWho3 -4.22942    2.75556  417.60549   -1.535   0.1256
## PosEvent:PosEventWho4 -5.74369    3.93844  416.84089   -1.458   0.1455
## PosEvent:PosEventWho5 -1.73211    2.43620  416.88364   -0.711   0.4775
## PosEvent:PosEventWho6  0.13762    0.80932  426.86173    0.170   0.8651
## PosEvent:PosEventWho7  0.85051    3.48111  416.09591    0.244   0.8071
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## Positive Event * Who event was with & SM checks
```

```
PA_sm_count_int <- lmer(phone_applications_foreground_rapids_countsm ~ PosEventRating_1_pm*PosEventWho_
summary(PA_sm_count_int)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: phone_applications_foreground_rapids_countsm ~ PosEventRating_1_pm *
##         PosEventWho_pm + day_in_study + (1 | pid)
## Data: data
##
## REML criterion at convergence: 32178.8
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.9237 -0.5597 -0.1739  0.3188  9.0884
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
```

```
## pid      (Intercept)  52.95    7.277
## Residual          137.64   11.732
## Number of obs: 4135, groups: pid, 19
##
## Fixed effects:
##
##              Estimate Std. Error      df t value
## (Intercept)    1.257e+01  1.833e+00  2.410e+01   6.858
## PosEventRating_1_pm -1.784e-02  3.325e-02  4.110e+03  -0.537
## PosEventWho_pm1    -8.358e-01  1.235e+00  4.117e+03  -0.677
## PosEventWho_pm12    1.542e+01  8.147e+00  4.110e+03   1.893
## PosEventWho_pm123   -3.163e+00  1.320e+01  4.109e+03  -0.240
## PosEventWho_pm13    8.372e+00  7.659e+00  4.109e+03   1.093
## PosEventWho_pm2     7.338e-01  1.874e+00  4.117e+03   0.391
## PosEventWho_pm3    -4.341e+00  9.839e+00  4.103e+03  -0.441
## day_in_study      -2.977e-02  2.306e-02  4.119e+03  -1.291
## PosEventRating_1_pm:PosEventWho_pm1  3.166e-02  3.637e-02  4.114e+03   0.870
## PosEventRating_1_pm:PosEventWho_pm12 -1.697e-01  9.936e-02  4.111e+03  -1.708
## PosEventRating_1_pm:PosEventWho_pm123 1.218e-01  1.614e-01  4.110e+03   0.755
## PosEventRating_1_pm:PosEventWho_pm13 -9.172e-02  9.587e-02  4.108e+03  -0.957
## PosEventRating_1_pm:PosEventWho_pm2   4.979e-03  4.031e-02  4.114e+03   0.124
## PosEventRating_1_pm:PosEventWho_pm3   5.018e-02  1.170e-01  4.104e+03   0.429
##
##              Pr(>|t|)
## (Intercept)    4.21e-07 ***
## PosEventRating_1_pm    0.5915
## PosEventWho_pm1       0.4987
## PosEventWho_pm12      0.0585 .
## PosEventWho_pm123     0.8107
## PosEventWho_pm13      0.2744
## PosEventWho_pm2       0.6955
## PosEventWho_pm3       0.6591
## day_in_study         0.1968
## PosEventRating_1_pm:PosEventWho_pm1  0.3841
## PosEventRating_1_pm:PosEventWho_pm12 0.0877 .
## PosEventRating_1_pm:PosEventWho_pm123 0.4506
## PosEventRating_1_pm:PosEventWho_pm13 0.3387
## PosEventRating_1_pm:PosEventWho_pm2  0.9017
## PosEventRating_1_pm:PosEventWho_pm3  0.6681
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
### collapsed across day, wihtin person only
```

```
PA_sm_count_int_test <- lmer(count_sm ~ PosEvent*PosEventWho + PA_average + day_in_study + (1 | pid), data = PA_sm_count_int_test_data)
summary(PA_sm_count_int_test) #####Significant - more SM if pos event is with
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: count_sm ~ PosEvent * PosEventWho + PA_average + day_in_study +
## (1 | pid)
## Data: day
##
## REML criterion at convergence: 5036.5
##
```



```
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.8799 -0.5521 -0.0796  0.4081  4.5362
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
##   pid      (Intercept) 13195      114.87
##   Residual                4463       66.81
## Number of obs: 448, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)    249.53475    61.52523   18.46374    4.056 0.000709 ***
## PosEvent         0.06367     0.26609  422.11639    0.239 0.811003
## PosEventWho2    -21.71497    17.00839  416.47228   -1.277 0.202412
## PosEventWho3    198.41157    94.85047  415.28049    2.092 0.037060 *
## PosEventWho4    141.30063   142.20693  415.21583    0.994 0.320983
## PosEventWho5     48.80711    80.11350  415.32250    0.609 0.542709
## PosEventWho6      5.32345    22.96213  416.57838    0.232 0.816779
## PosEventWho7   -52.44449   115.98008  415.00750   -0.452 0.651372
## PA_average      -0.09323     0.05200   16.94910   -1.793 0.090864 .
## day_in_study    -0.28822     0.38767  416.67608   -0.743 0.457621
## PosEvent:PosEventWho2  0.38455    0.39691  416.18986    0.969 0.333174
## PosEvent:PosEventWho3 -4.60046    1.89255  415.39036   -2.431 0.015487 *
## PosEvent:PosEventWho4 -1.95151    2.70386  415.16065   -0.722 0.470855
## PosEvent:PosEventWho5 -1.71262    1.67258  415.18142   -1.024 0.306459
## PosEvent:PosEventWho6 -0.45694    0.55901  418.17608   -0.817 0.414162
## PosEvent:PosEventWho7  0.39294    2.38903  414.97634    0.164 0.869437
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

#####Positive Affect During SM Use#####

Positive affect & minutes of SM

```
PA_on_SM <- lmer(phone_applications_foreground_rapids_sumdurationsm ~ SMPos_1_pm + day_in_study + (1 | pid)
summary(PA_on_SM)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: phone_applications_foreground_rapids_sumdurationsm ~ SMPos_1_pm +
##      day_in_study + (1 | pid)
##      Data: data
##
## REML criterion at convergence: 61018.8
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -1.7729 -0.4474 -0.2014  0.1208  5.6334
##
## Random effects:
##   Groups   Name                Variance Std.Dev.
```

```

## pid      (Intercept) 14.85    3.853
## Residual          104.35   10.215
## Number of obs: 8140, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   5.034e+00  9.948e-01  2.737e+01   5.060  2.5e-05 ***
## SMPos_1_pm    1.270e-02  6.324e-03  5.753e+03   2.009  0.0446 *
## day_in_study -9.224e-03  1.412e-02  8.061e+03  -0.653  0.5137
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) SMP_1_
## SMPos_1_pm   -0.392
## day_in_stdy -0.291  0.274

### collapsed across day, wihtin person only

PA_on_SM_test <- lmer(sum_sm ~ SM_Pos + PA_sm_average + day_in_study + (1 | pid), data = day)
summary(PA_on_SM_test)

## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: sum_sm ~ SM_Pos + PA_sm_average + day_in_study + (1 | pid)
## Data: day
##
## REML criterion at convergence: 4893.4
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -3.0812 -0.3197 -0.0834  0.2565  4.0897
##
## Random effects:
## Groups Name Variance Std.Dev.
## pid (Intercept) 5487 74.08
## Residual 10120 100.60
## Number of obs: 403, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   79.8511   42.3008  18.8947   1.888  0.0745 .
## SM_Pos         0.2296   0.2852 383.7966   0.805  0.4213
## PA_sm_average  0.3673   0.7566  22.9930   0.485  0.6320
## day_in_study  -0.2318   0.6097 395.3684  -0.380  0.7040
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) SM_Pos PA_sm_
## SM_Pos      -0.057
## PA_sm_averg -0.797 -0.374
## day_in_stdy -0.216  0.263 -0.087

```

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

```
PA_on_SM_count <- lmer(phone_applications_foreground_rapids_countsm ~ SMPos_1_pm + day_in_study + (1 | pid)
summary(PA_on_SM_count)
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula:
## phone_applications_foreground_rapids_countsm ~ SMPos_1_pm + day_in_study +
## (1 | pid)
## Data: data
##
## REML criterion at convergence: 33645.2
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
## -2.8721 -0.5505 -0.1731  0.3112  8.9254
##
## Random effects:
## Groups   Name            Variance Std.Dev.
## pid      (Intercept)    56.92     7.545
## Residual                    142.72    11.946
## Number of obs: 4303, groups: pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)   11.10199    1.89569   24.40078    5.856 4.55e-06 ***
## SMPos_1_pm     0.03275    0.01042  3961.91779     3.141 0.00169 **
## day_in_study  -0.02748    0.02276  4295.73125    -1.207 0.22738
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) SMP_1_
## SMPos_1_pm  -0.346
## day_in_stdy -0.256  0.294
```

```
### collapsed across day, wihtin person only
```

```
PA_on_SM_count_test <- lmer(count_sm ~ SM_Pos + PA_sm_average + day_in_study + (1 | pid), data = day)
summary(PA_on_SM_count_test) ##### higher PA while on SM = more SM chec
```

```
## Linear mixed model fit by REML. t-tests use Satterthwaite's method [
## lmerModLmerTest]
## Formula: count_sm ~ SM_Pos + PA_sm_average + day_in_study + (1 | pid)
## Data: day
##
## REML criterion at convergence: 4608.1
##
## Scaled residuals:
##      Min       1Q   Median       3Q      Max
```

```
## -3.6540 -0.5396 -0.1017  0.4095  4.5674
##
## Random effects:
##   Groups   Name      Variance Std.Dev.
##   pid      (Intercept) 15272    123.58
##   Residual              4602     67.84
## Number of obs: 403, groups:  pid, 19
##
## Fixed effects:
##              Estimate Std. Error      df t value Pr(>|t|)
## (Intercept)  142.67554   66.37956   17.06787   2.149 0.046235 *
## SM_Pos        0.73154    0.19241  382.09013   3.802 0.000167 ***
## PA_sm_average -0.71744    1.14110   17.72171  -0.629 0.537548
## day_in_study  -0.08481    0.41519  385.16803  -0.204 0.838256
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Correlation of Fixed Effects:
##              (Intr) SM_Pos PA_sm_
## SM_Pos      -0.024
## PA_sm_averg -0.881 -0.167
## day_in_stdy -0.092  0.266 -0.039
```

Positive Affect Bayesian Analyses

```
##### Positive Event Rating * Where Pos Event took place, within person, day-level
#PA_event_bayes <- brm(count_sm ~ PosEvent*PosEventWhere + PA_average + day_in_study + (1 | pid), prior = prior1,
  #family = "gaussian", data = day, warmup = 2.5e3, iter = 1.5e4, thin = 1,
  #chains = 4, cores = 4, seed = "123", control = list(adapt_delta = 0.999, max_treedepth = 500)
#tidy_stan(PA_event_bayes, prob = 0.95, typical = "mean", type = "fixed", digits = 3)

##### Positive Event Rating * Where Pos Event took place, within person, day-level
#PA_SM_bayes <- brm(count_sm ~ SM_Pos + PA_sm_average + day_in_study + (1 | pid), prior = prior1,
  #family = "gaussian", data = day, warmup = 2.5e3, iter = 1.5e4, thin = 1,
  #chains = 4, cores = 4, seed = "123", control = list(adapt_delta = 0.999, max_treedepth = 500)
#tidy_stan(PA_SM_bayes, prob = 0.95, typical = "mean", type = "fixed", digits = 3)
```