SARA: Results

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1 Background

1.1 Main Analysis

Hypotheses corresponding to each aim are:

- Aim 1: *Offering (vs. not offering) an inspirational quote increases the likelihood to fully complete current day's survey and/or active tasks. This hypothesis is directional; our goal is to increase survey and/or active task completion.* This corresponds to testing $H_0 : \beta \leq 0$ vs. $H_1 : \beta > 0$ where β is the marginal treatment effect on the log scale.
- Aim 2: *Offering positive reinforcement in the form of a meme (vs. not offering meme) following survey completion increases the likelihood to fully complete next day's survey and/or active tasks. This hypothesis is directional; our goal is to increase survey and/or active task completion.* This corresponds to testing $H_0 : \beta \leq 0$ vs. $H_1 : \beta > 0$ where β is the marginal treatment effect on the log scale.
- Aim 4: *Offering life insights (vs. not offering life insights) following active task completion increases the likelihood to fully complete next day's survey and/or active tasks. This hypothesis is directional; our goal is to increase survey and/or active task completion.* This corresponds to testing $H_0 : \beta \leq 0$ vs. $H_1 : \beta > 0$ where β is the marginal treatment effect on the log scale.

In main analysis, we perform a one-sided test with $\alpha = 0.025$ and the following control covariates:

- appusage_yes
- isCompleted_yesterday_yes
- contact_yes

1.2 Analysis with Moderators

We conduct exploratory analysis on the moderated effect of offering vs. not offering 4PM notification. We use the same set of participant days as in Main Aim 1 Analysis for this purpose. The moderated treatment effect on the log scale is modeled as $\beta_1 + \beta_2 X$ where moderators X considered were:

- female: 1 if individual is female, 0 if individual is male
- weekend: 1 if day is Saturday or Sunday, 0 if day is between Monday to Friday
- appusage_yes
- isCompleted_yesterday_yes
- contact_yes
- study_day

In the models above, we test the hypothesis $H_0 : c\beta = 0$ vs. $H_1 : c\beta \neq 0$ where $\beta = (\beta_1, \beta_2)$. We perform a two-sided test and use $\alpha = 0.05$ and the use same set of control covariates in primary analysis:

- appusage_yes
- isCompleted_yesterday_yes
- contact_yes

Analyses were also conducted to examine the moderated effect of offering a meme vs. not offering a meme and the moderated of offering a life insight vs. not offering a life insight.

1.3 More Analysis with Moderators

We conduct additional exploratory analysis on the moderated effect of offering vs. not offering 4PM notification when the moderated treatment effect on the log scale is modeled as $\beta_1 + \beta_2 X_1 + \beta_3 X_2 + \beta_4 X_3 + \beta_5 X_4$ where

- X_1 = weekend
- X_2 = contact_yes
- X_3 = appusage_yes
- X_4 = isCompleted_yesterday_yes

We test the hypothesis $H_0 : c\beta = 0$ vs. $H_1 : c\beta \neq 0$ where $\beta = (\beta_1, \beta_2, \beta_3, \beta_4, \beta_5)$ and c is some vector of real numbers. We perform a two-sided test and use $\alpha = 0.05$ and the use same set of control covariates in primary analysi:

- appusage_yes
- isCompleted_yesterday_yes
- contact_yes

Analyses were also conducted to examine the moderated effect of offering a meme vs. not offering a meme and the moderated of offering a life insight vs. not offering a life insight.

1.4 Analyses with Complete Case Data vs. Multiply Imputed Data

Main analyses and exploratory analyses were performed using complete case data and multiply imputed data. **Analyses with Complete Case Data.** Analysis with complete case data involved omitting participant days with missing intervention assignment from the data analysis. **Analyses with Multiply Imputed Data.** 10 imputed datasets were generated where in each imputed dataset, missing intervention assignment among available participant days were imputed by drawing from a $Bernoulli\left(\frac{1}{2}\right)$ distribution. Estimates of model parameters and standard errors were obtained using each imputed dataset and then pooled using the usual rules for combining inferences for multiple imputation (Little & Rubin, 1987).

2 Aim 1

2.1 Complete Case Analysis

Table 1 : Complete Case Analysis: Main Analysis

	exp	beta	se.beta	test.stat	p.val
beta	1.053	0.052	0.041	1.254	0.107
Intercept	0.289	-1.241	0.150	-8.278	0.000
appusage_yes	1.885	0.634	0.173	3.670	0.001
isCompleted_yesterday_yes	1.522	0.420	0.111	3.768	0.000
contact_yes	0.840	-0.174	0.038	-4.539	0.000

Table 2 : Complete Case Analysis: appusage_yes=1 vs. appusage_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.345	0.296	0.155	1.918	0.060
beta2	0.761	-0.273	0.156	-1.747	0.086
contrast: appusage_yes=0	1.345	0.296	0.155	1.918	0.060
contrast: appusage_yes=1	1.024	0.023	0.040	0.585	0.561
Intercept	0.254	-1.371	0.179	-7.643	0.000
appusage_yes	2.268	0.819	0.210	3.896	0.000
isCompleted_yesterday_yes	1.453	0.374	0.103	3.612	0.001
contact_yes	0.840	-0.174	0.038	-4.525	0.000

Table 3 : Complete Case Analysis: contact_yes=1 vs. contact_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.019	0.019	0.046	0.414	0.680
beta2	1.086	0.082	0.073	1.123	0.266
contrast: contact_yes=0	1.019	0.019	0.046	0.414	0.680
contrast: contact_yes=1	1.106	0.101	0.066	1.542	0.128
Intercept	0.296	-1.217	0.152	-8.029	0.000
appusage_yes	1.896	0.639	0.173	3.697	0.000
isCompleted_yesterday_yes	1.500	0.405	0.111	3.635	0.001
contact_yes	0.807	-0.215	0.057	-3.765	0.000

Table 4 : Complete Case Analysis: isCompleted_yesterday_yes=1 vs. isCompleted_yesterday_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.158	0.147	0.111	1.327	0.189
beta2	0.886	-0.121	0.105	-1.149	0.255
contrast: isCompleted_yesterday_yes=0	1.158	0.147	0.111	1.327	0.189
contrast: isCompleted_yesterday_yes=1	1.027	0.026	0.035	0.758	0.452
Intercept	0.283	-1.263	0.149	-8.490	0.000
appusage_yes	1.797	0.586	0.178	3.292	0.002
isCompleted_yesterday_yes	1.647	0.499	0.151	3.303	0.002
contact_yes	0.847	-0.166	0.038	-4.420	0.000

Table 5 : Complete Case Analysis: female=1 vs. female=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.060	0.059	0.073	0.806	0.424
beta2	0.988	-0.012	0.092	-0.135	0.893
contrast: male	1.060	0.059	0.073	0.806	0.424
contrast: female	1.047	0.046	0.052	0.886	0.379
Intercept	0.289	-1.240	0.150	-8.289	0.000
appusage_yes	1.884	0.633	0.172	3.679	0.000
isCompleted_yesterday_yes	1.523	0.420	0.111	3.787	0.000
contact_yes	0.840	-0.175	0.039	-4.530	0.000

Table 6 : Complete Case Analysis: study_day

	exp	beta	se.beta	test.stat	p.val
beta1	1.029	0.028	0.067	0.426	0.672
beta2	1.002	0.002	0.004	0.426	0.672
Intercept	0.289	-1.240	0.149	-8.312	0.000
appusage_yes	1.881	0.632	0.172	3.671	0.001
isCompleted_yesterday_yes	1.524	0.421	0.112	3.772	0.000
contact_yes	0.840	-0.174	0.038	-4.528	0.000

Table 7 : Complete Case Analysis: weekend=1 vs. weekend=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.008	0.008	0.045	0.188	0.851
beta2	1.171	0.158	0.076	2.074	0.042
contrast: weekday	1.008	0.008	0.045	0.188	0.851
contrast: weekend	1.181	0.166	0.073	2.269	0.027
Intercept	0.287	-1.247	0.150	-8.304	0.000
appusage_yes	1.882	0.632	0.172	3.685	0.000
isCompleted_yesterday_yes	1.532	0.427	0.111	3.848	0.000
contact_yes	0.845	-0.169	0.039	-4.365	0.000

Table 8 : Complete Case Analysis: Four Moderators in One Model

	exp	beta_contrast	se.beta_contrast	test.stat.beta_contrast	p.val
beta1	1.286	0.251	0.181	1.389	0.170
beta2	1.169	0.156	0.075	2.086	0.041
beta3	1.065	0.063	0.073	0.855	0.396
beta4	0.796	-0.228	0.155	-1.470	0.147
beta5	0.923	-0.080	0.101	-0.792	0.431
(1,1,1,0,0)	1.600	0.470	0.191	2.460	0.017
(1,1,0,0,0)	1.503	0.407	0.194	2.104	0.040
(1,0,1,0,0)	1.369	0.314	0.179	1.756	0.084
(1,1,1,0,1)	1.477	0.390	0.161	2.417	0.019
(1,1,0,0,1)	1.388	0.328	0.164	2.001	0.050
(1,0,1,0,1)	1.264	0.234	0.152	1.538	0.129
(1,1,1,1,0)	1.274	0.242	0.135	1.787	0.079
(1,1,0,1,0)	1.197	0.179	0.129	1.388	0.170
(1,0,1,1,0)	1.090	0.086	0.118	0.727	0.470
(1,1,1,1,1)	1.176	0.162	0.084	1.942	0.057
(1,1,0,1,1)	1.105	0.100	0.072	1.392	0.169
(1,0,1,1,1)	1.006	0.006	0.065	0.093	0.927
(1,0,0,0,0)	1.286	0.251	0.181	1.389	0.170
(1,0,0,0,1)	1.187	0.171	0.154	1.113	0.270
(1,0,0,1,0)	1.023	0.023	0.110	0.211	0.834
(1,0,0,1,1)	0.945	-0.057	0.047	-1.215	0.229

2.2 Analysis with Multiply Imputed Data

Table 1 : Analysis with Multiple Imputed Data: Main Analysis

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta	1.047	0.046	0.042	1.095	0.139
Intercept	0.317	-1.148	0.144	-7.978	0.000
appusage_yes	1.610	0.476	0.177	2.693	0.009
isCompleted_yesterday_yes	1.638	0.493	0.129	3.828	0.000
contact_yes	0.834	-0.182	0.039	-4.646	0.000

Table 2 : Analysis with Multiple Imputed Data: appusage_yes=1 vs. appusage_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.211	0.189	0.155	1.220	0.227
beta2	0.848	-0.167	0.158	-1.053	0.296
contrast: appusage_yes=0	1.211	0.189	0.155	1.220	0.227
contrast: appusage_yes=1	1.023	0.022	0.040	0.554	0.581
Intercept	0.297	-1.216	0.177	-6.884	0.000
appusage_yes	1.808	0.591	0.232	2.547	0.013
isCompleted_yesterday_yes	1.575	0.454	0.130	3.489	0.001
contact_yes	0.835	-0.180	0.039	-4.628	0.000

Table 3 : Analysis with Multiple Imputed Data: contact_yes=1 vs. contact_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.016	0.016	0.046	0.339	0.736
beta2	1.078	0.075	0.076	0.985	0.328
contrast: contact_yes=0	1.016	0.016	0.046	0.339	0.736
contrast: contact_yes=1	1.095	0.090	0.068	1.327	0.189
Intercept	0.325	-1.123	0.146	-7.706	0.000
appusage_yes	1.613	0.478	0.178	2.684	0.009
isCompleted_yesterday_yes	1.616	0.480	0.129	3.717	0.000
contact_yes	0.803	-0.219	0.058	-3.750	0.000

Table 4 : Analysis with Multiple Imputed Data: isCompleted_yesterday_yes=1 vs. isCompleted_yesterday_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.133	0.125	0.116	1.078	0.285
beta2	0.905	-0.100	0.111	-0.903	0.370
contrast: isCompleted_yesterday_yes=0	1.133	0.125	0.116	1.078	0.285
contrast: isCompleted_yesterday_yes=1	1.025	0.024	0.035	0.691	0.492
Intercept	0.309	-1.175	0.147	-7.987	0.000
appusage_yes	1.557	0.443	0.176	2.509	0.015
isCompleted_yesterday_yes	1.753	0.561	0.162	3.461	0.001
contact_yes	0.840	-0.175	0.039	-4.505	0.000

Table 5 : Analysis with Multiple Imputed Data: female=1 vs. female=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.047	0.045	0.072	0.626	0.534
beta2	1.001	0.001	0.091	0.010	0.992
contrast: male	1.047	0.045	0.072	0.626	0.534
contrast: female	1.047	0.046	0.052	0.896	0.374
Intercept	0.317	-1.148	0.144	-7.971	0.000
appusage_yes	1.610	0.476	0.177	2.695	0.009
isCompleted_yesterday_yes	1.638	0.493	0.128	3.839	0.000
contact_yes	0.834	-0.182	0.039	-4.637	0.000

Table 6 : Analysis with Multiple Imputed Data: study_day

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.028	0.027	0.067	0.410	0.684
beta2	1.001	0.001	0.004	0.333	0.741
Intercept	0.317	-1.148	0.143	-8.006	0.000
appusage_yes	1.609	0.475	0.176	2.704	0.009
isCompleted_yesterday_yes	1.639	0.494	0.129	3.839	0.000
contact_yes	0.834	-0.181	0.039	-4.629	0.000

Table 7 : Analysis with Multiple Imputed Data: weekend=1 vs. weekend=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.002	0.002	0.045	0.044	0.965
beta2	1.174	0.161	0.076	2.107	0.039
contrast: weekday	1.002	0.002	0.045	0.044	0.965
contrast: weekend	1.177	0.163	0.074	2.197	0.032
Intercept	0.315	-1.154	0.145	-7.979	0.000
appusage_yes	1.605	0.473	0.178	2.658	0.010
isCompleted_yesterday_yes	1.651	0.502	0.129	3.874	0.000
contact_yes	0.839	-0.176	0.039	-4.461	0.000

Table 8 : Analysis with Multiple Imputed Data: Four Moderators in One Model

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.157	0.142	0.185	0.769	0.445
beta2	1.175	0.161	0.075	2.147	0.036
beta3	1.066	0.064	0.074	0.857	0.395
beta4	0.877	-0.133	0.153	-0.872	0.387
beta5	0.936	-0.067	0.106	-0.629	0.532
(1,1,1,0,0)	1.449	0.368	0.199	1.847	0.070
(1,1,0,0,0)	1.359	0.304	0.197	1.540	0.129
(1,0,1,0,0)	1.233	0.206	0.187	1.104	0.274
(1,1,1,0,1)	1.354	0.301	0.162	1.854	0.069
(1,1,0,0,1)	1.271	0.237	0.159	1.491	0.141
(1,0,1,0,1)	1.152	0.140	0.150	0.933	0.355
(1,1,1,1,0)	1.265	0.235	0.136	1.727	0.089
(1,1,0,1,0)	1.187	0.171	0.129	1.323	0.191
(1,0,1,1,0)	1.076	0.073	0.121	0.607	0.546
(1,1,1,1,1)	1.183	0.168	0.086	1.954	0.055
(1,1,0,1,1)	1.110	0.104	0.073	1.434	0.157
(1,0,1,1,1)	1.007	0.007	0.065	0.103	0.918
(1,0,0,0,0)	1.157	0.142	0.185	0.769	0.445
(1,0,0,0,1)	1.081	0.076	0.147	0.517	0.607
(1,0,0,1,0)	1.010	0.009	0.114	0.083	0.934
(1,0,0,1,1)	0.945	-0.057	0.048	-1.187	0.240

3 Aim 2

3.1 Complete Case Analysis

Table 1 : Complete Case Analysis: Main Analysis

	exp	beta	se.beta	test.stat	p.val
beta	0.964	-0.037	0.035	-1.056	0.852
Intercept	0.598	-0.514	0.121	-4.229	0.000
appusage_yes	1.133	0.125	0.095	1.314	0.194
isCompleted_yesterday_yes	1.277	0.245	0.065	3.770	0.000
contact_yes	0.923	-0.080	0.042	-1.935	0.057

Table 2 : Complete Case Analysis: appusage_yes=1 vs. appusage_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.940	-0.062	0.144	-0.430	0.669
beta2	1.030	0.029	0.150	0.196	0.845
contrast: appusage_yes=0	0.940	-0.062	0.144	-0.430	0.669
contrast: appusage_yes=1	0.968	-0.032	0.039	-0.831	0.409
Intercept	0.604	-0.503	0.154	-3.262	0.002
appusage_yes	1.098	0.093	0.140	0.666	0.508
isCompleted_yesterday_yes	1.292	0.256	0.073	3.504	0.001
contact_yes	0.924	-0.080	0.046	-1.736	0.088

Table 3 : Complete Case Analysis: contact_yes=1 vs. contact_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.973	-0.028	0.049	-0.562	0.576
beta2	0.980	-0.020	0.081	-0.245	0.807
contrast: contact_yes=0	0.973	-0.028	0.049	-0.562	0.576
contrast: contact_yes=1	0.954	-0.048	0.062	-0.769	0.445
Intercept	0.595	-0.520	0.124	-4.195	0.000
appusage_yes	1.114	0.108	0.093	1.166	0.248
isCompleted_yesterday_yes	1.290	0.255	0.071	3.585	0.001
contact_yes	0.932	-0.070	0.053	-1.322	0.191

Table 4 : Complete Case Analysis: isCompleted_yesterday_yes=1 vs. isCompleted_yesterday_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.745	-0.294	0.130	-2.258	0.027
beta2	1.359	0.307	0.131	2.338	0.023
contrast: isCompleted_yesterday_yes=0	0.745	-0.294	0.130	-2.258	0.027
contrast: isCompleted_yesterday_yes=1	1.013	0.012	0.035	0.353	0.725
Intercept	0.652	-0.428	0.137	-3.121	0.003
appusage_yes	1.150	0.140	0.104	1.338	0.186
isCompleted_yesterday_yes	1.122	0.115	0.085	1.353	0.181
contact_yes	0.920	-0.083	0.046	-1.800	0.077

Table 5 : Complete Case Analysis: female=1 vs. female=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.036	0.036	0.057	0.623	0.536
beta2	0.883	-0.124	0.079	-1.567	0.122
contrast: male	1.036	0.036	0.057	0.623	0.536
contrast: female	0.915	-0.088	0.052	-1.696	0.095
Intercept	0.593	-0.523	0.119	-4.390	0.000
appusage_yes	1.116	0.110	0.084	1.304	0.197
isCompleted_yesterday_yes	1.301	0.263	0.073	3.589	0.001
contact_yes	0.920	-0.083	0.045	-1.849	0.069

Table 6 : Complete Case Analysis: study_day

	exp	beta	se.beta	test.stat	p.val
beta1	0.969	-0.032	0.075	-0.427	0.671
beta2	1.000	0.000	0.005	-0.050	0.960
Intercept	0.598	-0.515	0.127	-4.061	0.000
appusage_yes	1.114	0.108	0.093	1.163	0.249
isCompleted_yesterday_yes	1.289	0.254	0.075	3.379	0.001
contact_yes	0.923	-0.080	0.047	-1.703	0.094

Table 7 : Complete Case Analysis: weekend=1 vs. weekend=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.968	-0.032	0.049	-0.658	0.513
beta2	0.990	-0.010	0.087	-0.117	0.907
contrast: weekday	0.968	-0.032	0.049	-0.658	0.513
contrast: weekend	0.958	-0.043	0.064	-0.666	0.508
Intercept	0.598	-0.515	0.126	-4.078	0.000
appusage_yes	1.114	0.108	0.092	1.175	0.245
isCompleted_yesterday_yes	1.288	0.253	0.073	3.448	0.001
contact_yes	0.923	-0.080	0.045	-1.762	0.083

Table 8 : Complete Case Analysis: Four Moderators in One Model

	exp	beta_contrast	se.beta_contrast	test.stat.beta_contrast	p.val
beta1	0.700	-0.357	0.234	-1.524	0.135
beta2	1.014	0.014	0.097	0.144	0.886
beta3	1.007	0.007	0.083	0.080	0.936
beta4	1.058	0.057	0.158	0.357	0.723
beta5	1.368	0.313	0.142	2.199	0.034
(1,1,1,0,0)	0.714	-0.337	0.224	-1.505	0.140
(1,1,0,0,0)	0.709	-0.343	0.219	-1.566	0.125
(1,0,1,0,0)	0.704	-0.351	0.235	-1.490	0.144
(1,1,1,0,1)	0.977	-0.024	0.182	-0.130	0.897
(1,1,0,0,1)	0.970	-0.030	0.167	-0.182	0.857
(1,0,1,0,1)	0.963	-0.038	0.158	-0.239	0.813
(1,1,1,1,0)	0.756	-0.280	0.120	-2.337	0.024
(1,1,0,1,0)	0.751	-0.287	0.123	-2.324	0.025
(1,0,1,1,0)	0.745	-0.294	0.154	-1.912	0.063
(1,1,1,1,1)	1.033	0.033	0.095	0.345	0.731
(1,1,0,1,1)	1.027	0.026	0.081	0.322	0.749
(1,0,1,1,1)	1.019	0.019	0.068	0.279	0.782
(1,0,0,0,0)	0.700	-0.357	0.234	-1.524	0.135
(1,0,0,0,1)	0.957	-0.044	0.145	-0.305	0.762
(1,0,0,1,0)	0.740	-0.301	0.161	-1.864	0.069
(1,0,0,1,1)	1.012	0.012	0.061	0.203	0.840

3.2 Analysis with Multiply Imputed Data

Table 1 : Analysis with Multiple Imputed Data: Main Analysis

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta	0.966	-0.035	0.034	-1.017	0.843
Intercept	0.614	-0.488	0.110	-4.414	0.000
appusage_yes	1.105	0.100	0.081	1.234	0.222
isCompleted_yesterday_yes	1.273	0.242	0.065	3.715	0.000
contact_yes	0.930	-0.073	0.040	-1.833	0.071

Table 2 : Analysis with Multiple Imputed Data: appusage_yes=1 vs. appusage_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.944	-0.058	0.132	-0.441	0.661
beta2	1.028	0.027	0.138	0.199	0.843
contrast: appusage_yes=0	0.944	-0.058	0.132	-0.441	0.661
contrast: appusage_yes=1	0.970	-0.031	0.039	-0.789	0.433
Intercept	0.619	-0.479	0.136	-3.530	0.001
appusage_yes	1.073	0.070	0.118	0.595	0.554
isCompleted_yesterday_yes	1.287	0.252	0.073	3.439	0.001
contact_yes	0.932	-0.071	0.043	-1.629	0.108

Table 3 : Analysis with Multiple Imputed Data: contact_yes=1 vs. contact_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.973	-0.027	0.049	-0.557	0.580
beta2	0.985	-0.016	0.079	-0.196	0.845
contrast: contact_yes=0	0.973	-0.027	0.049	-0.557	0.580
contrast: contact_yes=1	0.958	-0.043	0.060	-0.711	0.480
Intercept	0.611	-0.493	0.114	-4.336	0.000
appusage_yes	1.088	0.084	0.079	1.059	0.294
isCompleted_yesterday_yes	1.285	0.251	0.071	3.518	0.001
contact_yes	0.939	-0.063	0.051	-1.237	0.221

Table 4 : Analysis with Multiple Imputed Data: isCompleted_yesterday_yes=1 vs. isCompleted_yesterday_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.755	-0.281	0.126	-2.229	0.029
beta2	1.341	0.293	0.127	2.301	0.025
contrast: isCompleted_yesterday_yes=0	0.755	-0.281	0.126	-2.229	0.029
contrast: isCompleted_yesterday_yes=1	1.012	0.012	0.035	0.351	0.727
Intercept	0.667	-0.405	0.124	-3.265	0.002
appusage_yes	1.120	0.113	0.090	1.251	0.216
isCompleted_yesterday_yes	1.124	0.117	0.085	1.385	0.171
contact_yes	0.929	-0.074	0.044	-1.667	0.101

Table 5 : Analysis with Multiple Imputed Data: female=1 vs. female=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.034	0.034	0.056	0.600	0.551
beta2	0.890	-0.116	0.078	-1.489	0.142
contrast: male	1.034	0.034	0.056	0.600	0.551
contrast: female	0.921	-0.083	0.052	-1.590	0.117
Intercept	0.610	-0.495	0.110	-4.490	0.000
appusage_yes	1.088	0.084	0.073	1.157	0.252
isCompleted_yesterday_yes	1.294	0.258	0.073	3.515	0.001
contact_yes	0.929	-0.074	0.043	-1.727	0.089

Table 6 : Analysis with Multiple Imputed Data: study_day

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.975	-0.026	0.072	-0.358	0.722
beta2	0.999	-0.001	0.005	-0.119	0.906
Intercept	0.613	-0.489	0.117	-4.187	0.000
appusage_yes	1.088	0.084	0.080	1.056	0.295
isCompleted_yesterday_yes	1.283	0.249	0.075	3.317	0.002
contact_yes	0.931	-0.071	0.045	-1.596	0.116

Table 7 : Analysis with Multiple Imputed Data: weekend=1 vs. weekend=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.970	-0.030	0.048	-0.624	0.535
beta2	0.988	-0.012	0.086	-0.136	0.892
contrast: weekday	0.970	-0.030	0.048	-0.624	0.535
contrast: weekend	0.959	-0.042	0.065	-0.644	0.522
Intercept	0.613	-0.489	0.116	-4.215	0.000
appusage_yes	1.088	0.084	0.079	1.068	0.289
isCompleted_yesterday_yes	1.283	0.249	0.073	3.397	0.001
contact_yes	0.931	-0.071	0.043	-1.653	0.103

Table 8 : Analysis with Multiple Imputed Data: Four Moderators in One Model

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.711	-0.341	0.225	-1.519	0.134
beta2	1.013	0.013	0.096	0.136	0.892
beta3	1.011	0.011	0.081	0.133	0.895
beta4	1.054	0.052	0.147	0.356	0.723
beta5	1.350	0.300	0.139	2.162	0.035
(1,1,1,0,0)	0.728	-0.318	0.207	-1.536	0.130
(1,1,0,0,0)	0.720	-0.328	0.207	-1.584	0.119
(1,0,1,0,0)	0.719	-0.331	0.221	-1.499	0.139
(1,1,1,0,1)	0.983	-0.018	0.168	-0.106	0.916
(1,1,0,0,1)	0.972	-0.028	0.156	-0.182	0.856
(1,0,1,0,1)	0.970	-0.031	0.145	-0.212	0.833
(1,1,1,1,0)	0.767	-0.265	0.116	-2.297	0.025
(1,1,0,1,0)	0.759	-0.276	0.122	-2.266	0.027
(1,0,1,1,0)	0.757	-0.278	0.148	-1.887	0.064
(1,1,1,1,1)	1.035	0.034	0.096	0.359	0.721
(1,1,0,1,1)	1.024	0.024	0.081	0.291	0.772
(1,0,1,1,1)	1.022	0.021	0.067	0.320	0.750
(1,0,0,0,0)	0.711	-0.341	0.225	-1.519	0.134
(1,0,0,0,1)	0.960	-0.041	0.137	-0.303	0.763
(1,0,0,1,0)	0.749	-0.289	0.158	-1.833	0.072
(1,0,0,1,1)	1.011	0.011	0.059	0.180	0.858

4 Aim 4

4.1 Complete Case Analysis

Table 1 : Complete Case Analysis: Main Analysis

	exp	beta	se.beta	test.stat	p.val
beta	0.984	-0.016	0.040	-0.399	0.654
Intercept	0.672	-0.397	0.124	-3.204	0.002
appusage_yes	1.013	0.013	0.082	0.155	0.877
isCompleted_yesterday_yes	1.249	0.223	0.078	2.871	0.006
contact_yes	0.912	-0.092	0.047	-1.963	0.054

Table 2 : Complete Case Analysis: appusage_yes=1 vs. appusage_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.870	-0.139	0.131	-1.062	0.292
beta2	1.128	0.121	0.136	0.890	0.377
contrast: appusage_yes=0	0.870	-0.139	0.131	-1.062	0.292
contrast: appusage_yes=1	0.982	-0.018	0.044	-0.415	0.680
Intercept	0.718	-0.332	0.156	-2.125	0.038
appusage_yes	0.932	-0.070	0.116	-0.608	0.546
isCompleted_yesterday_yes	1.259	0.231	0.089	2.580	0.012
contact_yes	0.910	-0.094	0.053	-1.783	0.079

Table 3 : Complete Case Analysis: contact_yes=1 vs. contact_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.908	-0.097	0.048	-2.007	0.049
beta2	1.216	0.196	0.092	2.137	0.037
contrast: contact_yes=0	0.908	-0.097	0.048	-2.007	0.049
contrast: contact_yes=1	1.104	0.099	0.079	1.257	0.213
Intercept	0.707	-0.347	0.126	-2.751	0.008
appusage_yes	0.987	-0.013	0.073	-0.183	0.856
isCompleted_yesterday_yes	1.250	0.224	0.088	2.545	0.013
contact_yes	0.826	-0.191	0.072	-2.665	0.010

Table 4 : Complete Case Analysis: isCompleted_yesterday_yes=1 vs. isCompleted_yesterday_yes=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.360	0.308	0.125	2.459	0.017
beta2	0.669	-0.402	0.135	-2.978	0.004
contrast: isCompleted_yesterday_yes=0	1.360	0.308	0.125	2.459	0.017
contrast: isCompleted_yesterday_yes=1	0.910	-0.095	0.046	-2.048	0.045
Intercept	0.567	-0.568	0.152	-3.737	0.000
appusage_yes	0.976	-0.024	0.064	-0.376	0.708
isCompleted_yesterday_yes	1.571	0.452	0.132	3.423	0.001
contact_yes	0.918	-0.086	0.052	-1.656	0.103

Table 5 : Complete Case Analysis: female=1 vs. female=0

	exp	beta	se.beta	test.stat	p.val
beta1	0.953	-0.048	0.060	-0.814	0.419
beta2	1.033	0.032	0.088	0.366	0.716
contrast: male	0.953	-0.048	0.060	-0.814	0.419
contrast: female	0.984	-0.016	0.062	-0.263	0.793
Intercept	0.681	-0.384	0.132	-2.913	0.005
appusage_yes	0.989	-0.011	0.079	-0.135	0.893
isCompleted_yesterday_yes	1.255	0.227	0.088	2.585	0.012
contact_yes	0.913	-0.091	0.054	-1.704	0.093

Table 6 : Complete Case Analysis: study_day

	exp	beta	se.beta	test.stat	p.val
beta1	0.960	-0.041	0.073	-0.552	0.583
beta2	1.001	0.001	0.005	0.150	0.881
Intercept	0.680	-0.386	0.131	-2.946	0.005
appusage_yes	0.991	-0.009	0.078	-0.111	0.912
isCompleted_yesterday_yes	1.257	0.229	0.088	2.595	0.012
contact_yes	0.910	-0.094	0.053	-1.785	0.079

Table 7 : Complete Case Analysis: weekend=1 vs. weekend=0

	exp	beta	se.beta	test.stat	p.val
beta1	1.006	0.006	0.054	0.103	0.918
beta2	0.881	-0.126	0.098	-1.284	0.204
contrast: weekday	1.006	0.006	0.054	0.103	0.918
contrast: weekend	0.886	-0.121	0.077	-1.563	0.123
Intercept	0.687	-0.376	0.132	-2.848	0.006
appusage_yes	0.994	-0.006	0.081	-0.076	0.940
isCompleted_yesterday_yes	1.240	0.215	0.089	2.411	0.019
contact_yes	0.907	-0.098	0.053	-1.835	0.071

Table 8 : Complete Case Analysis: Four Moderators in One Model

	exp	beta_contrast	se.beta_contrast	test.stat.beta_contrast	p.val
beta1	1.201	0.183	0.158	1.155	0.255
beta2	0.853	-0.159	0.092	-1.735	0.090
beta3	1.167	0.155	0.092	1.688	0.099
beta4	1.141	0.132	0.138	0.954	0.346
beta5	0.667	-0.405	0.130	-3.118	0.003
(1,1,1,0,0)	1.196	0.179	0.186	0.963	0.341
(1,1,0,0,0)	1.025	0.024	0.176	0.138	0.891
(1,0,1,0,0)	1.402	0.338	0.172	1.962	0.057
(1,1,1,0,1)	0.798	-0.226	0.164	-1.378	0.176
(1,1,0,0,1)	0.683	-0.381	0.148	-2.577	0.014
(1,0,1,0,1)	0.935	-0.067	0.162	-0.416	0.680
(1,1,1,1,0)	1.365	0.311	0.157	1.974	0.055
(1,1,0,1,0)	1.169	0.156	0.155	1.009	0.319
(1,0,1,1,0)	1.599	0.470	0.135	3.490	0.001
(1,1,1,1,1)	0.910	-0.094	0.098	-0.966	0.340
(1,1,0,1,1)	0.779	-0.249	0.085	-2.940	0.005
(1,0,1,1,1)	1.067	0.064	0.084	0.764	0.449
(1,0,0,0,0)	1.201	0.183	0.158	1.155	0.255
(1,0,0,0,1)	0.801	-0.222	0.142	-1.560	0.127
(1,0,0,1,0)	1.370	0.315	0.128	2.469	0.018
(1,0,0,1,1)	0.914	-0.090	0.062	-1.464	0.151

4.2 Analysis with Multiply Imputed Data

Table 1 : Analysis with Multiple Imputed Data: Main Analysis

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta	0.984	-0.016	0.039	-0.420	0.662
Intercept	0.672	-0.397	0.094	-4.208	0.000
appusage_yes	0.995	-0.005	0.055	-0.098	0.922
isCompleted_yesterday_yes	1.275	0.243	0.074	3.291	0.002
contact_yes	0.914	-0.090	0.046	-1.939	0.057

Table 2 : Analysis with Multiple Imputed Data: appusage_yes=1 vs. appusage_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.918	-0.087	0.109	-0.793	0.431
beta2	1.072	0.068	0.115	0.595	0.554
contrast: appusage_yes=0	0.918	-0.087	0.109	-0.793	0.431
contrast: appusage_yes=1	0.982	-0.018	0.044	-0.417	0.678
Intercept	0.712	-0.339	0.117	-2.891	0.005
appusage_yes	0.933	-0.070	0.085	-0.825	0.413
isCompleted_yesterday_yes	1.271	0.240	0.083	2.870	0.006
contact_yes	0.909	-0.095	0.053	-1.806	0.076

Table 3 : Analysis with Multiple Imputed Data: contact_yes=1 vs. contact_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.915	-0.089	0.048	-1.854	0.069
beta2	1.204	0.186	0.091	2.037	0.046
contrast: contact_yes=0	0.915	-0.089	0.048	-1.854	0.069
contrast: contact_yes=1	1.102	0.097	0.078	1.247	0.217
Intercept	0.718	-0.331	0.098	-3.366	0.001
appusage_yes	0.960	-0.041	0.050	-0.810	0.421
isCompleted_yesterday_yes	1.263	0.234	0.082	2.854	0.006
contact_yes	0.830	-0.186	0.072	-2.604	0.012

Table 4 : Analysis with Multiple Imputed Data: isCompleted_yesterday_yes=1 vs. isCompleted_yesterday_yes=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.318	0.275	0.125	2.204	0.031
beta2	0.696	-0.363	0.134	-2.708	0.009
contrast: isCompleted_yesterday_yes=0	1.318	0.275	0.125	2.204	0.031
contrast: isCompleted_yesterday_yes=1	0.917	-0.087	0.044	-1.962	0.054
Intercept	0.591	-0.526	0.129	-4.064	0.000
appusage_yes	0.950	-0.051	0.050	-1.024	0.310
isCompleted_yesterday_yes	1.546	0.436	0.124	3.500	0.001
contact_yes	0.916	-0.088	0.051	-1.716	0.091

Table 5 : Analysis with Multiple Imputed Data: female=1 vs. female=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.957	-0.044	0.061	-0.730	0.468
beta2	1.029	0.028	0.087	0.324	0.747
contrast: male	0.957	-0.044	0.061	-0.730	0.468
contrast: female	0.984	-0.016	0.060	-0.270	0.788
Intercept	0.694	-0.365	0.102	-3.585	0.001
appusage_yes	0.964	-0.037	0.054	-0.688	0.494
isCompleted_yesterday_yes	1.266	0.236	0.082	2.862	0.006
contact_yes	0.912	-0.093	0.053	-1.741	0.087

Table 6 : Analysis with Multiple Imputed Data: study_day

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	0.963	-0.037	0.074	-0.507	0.614
beta2	1.001	0.001	0.005	0.135	0.893
Intercept	0.693	-0.366	0.101	-3.617	0.001
appusage_yes	0.965	-0.036	0.053	-0.672	0.504
isCompleted_yesterday_yes	1.267	0.237	0.083	2.869	0.006
contact_yes	0.909	-0.095	0.053	-1.809	0.075

Table 7 : Analysis with Multiple Imputed Data: weekend=1 vs. weekend=0

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.005	0.005	0.052	0.103	0.918
beta2	0.887	-0.120	0.095	-1.273	0.208
contrast: weekday	1.005	0.005	0.052	0.103	0.918
contrast: weekend	0.891	-0.115	0.075	-1.535	0.130
Intercept	0.698	-0.359	0.101	-3.543	0.001
appusage_yes	0.969	-0.031	0.055	-0.575	0.567
isCompleted_yesterday_yes	1.253	0.225	0.084	2.687	0.009
contact_yes	0.907	-0.098	0.053	-1.850	0.069

Table 8 : Analysis with Multiple Imputed Data: Four Moderators in One Model

	pooled.exp.beta	pooled.beta	pooled.se.beta	test.stat	p.val
beta1	1.250	0.220	0.163	1.346	0.183
beta2	0.861	-0.150	0.088	-1.703	0.094
beta3	1.158	0.147	0.092	1.601	0.115
beta4	1.063	0.060	0.116	0.516	0.608
beta5	0.695	-0.364	0.130	-2.800	0.007
(1,1,1,0,0)	1.244	0.217	0.185	1.170	0.247
(1,1,0,0,0)	1.075	0.070	0.177	0.394	0.695
(1,0,1,0,0)	1.447	0.367	0.174	2.103	0.040
(1,1,1,0,1)	0.863	-0.148	0.143	-1.037	0.304
(1,1,0,0,1)	0.745	-0.295	0.123	-2.395	0.020
(1,0,1,0,1)	1.003	0.002	0.140	0.018	0.986
(1,1,1,1,0)	1.318	0.276	0.153	1.810	0.075
(1,1,0,1,0)	1.138	0.129	0.151	0.857	0.395
(1,0,1,1,0)	1.532	0.427	0.132	3.224	0.002
(1,1,1,1,1)	0.916	-0.088	0.098	-0.896	0.374
(1,1,0,1,1)	0.791	-0.235	0.084	-2.809	0.007
(1,0,1,1,1)	1.064	0.062	0.084	0.742	0.461
(1,0,0,0,0)	1.250	0.220	0.163	1.346	0.183
(1,0,0,0,1)	0.866	-0.145	0.117	-1.231	0.223
(1,0,0,1,0)	1.323	0.279	0.127	2.192	0.032
(1,0,0,1,1)	0.919	-0.085	0.061	-1.394	0.169

5 References

1. Little RJA, Rubin DB. Statistical Analysis with Missing Data. J Wiley & Sons: New York, NY, USA, 1987.