

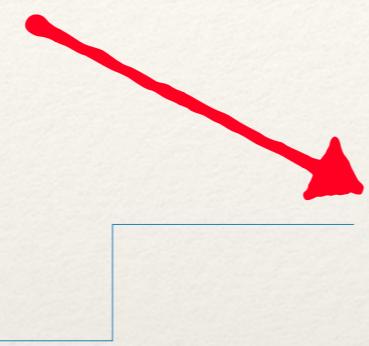
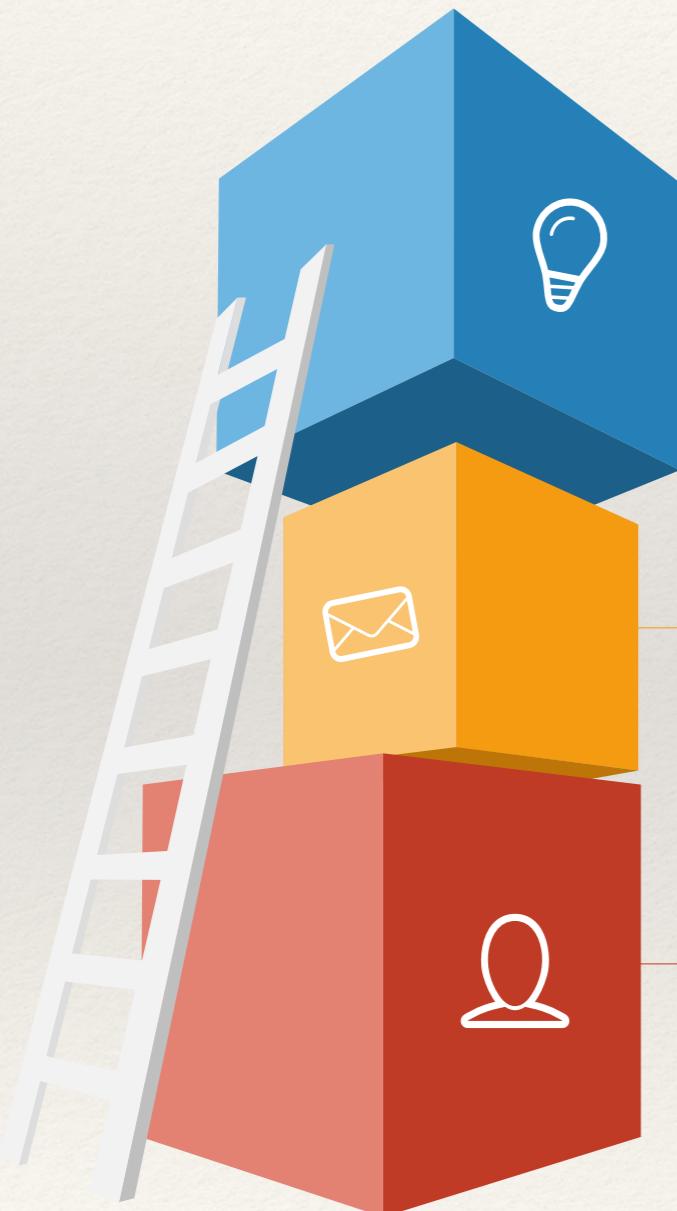


MKGT 3597

Branding and Social Influence Analysis on Social Network

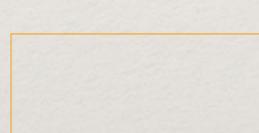
Yiru Wang
Yezhu Li
Lipin Yuan
Bochen Wang

Why Social Media Marketing Important?



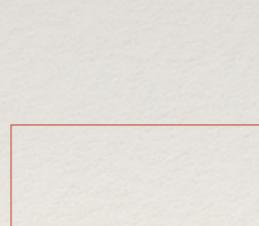
Improve Customer Insights

Learn about your customers and connect with your audience



Higher conversion rates

Working on your desired targeting group



Increase Brand Recognition

A strong social media presence gives a voice to your brand.

How to Improve Customer Insights



Individual
Level Data

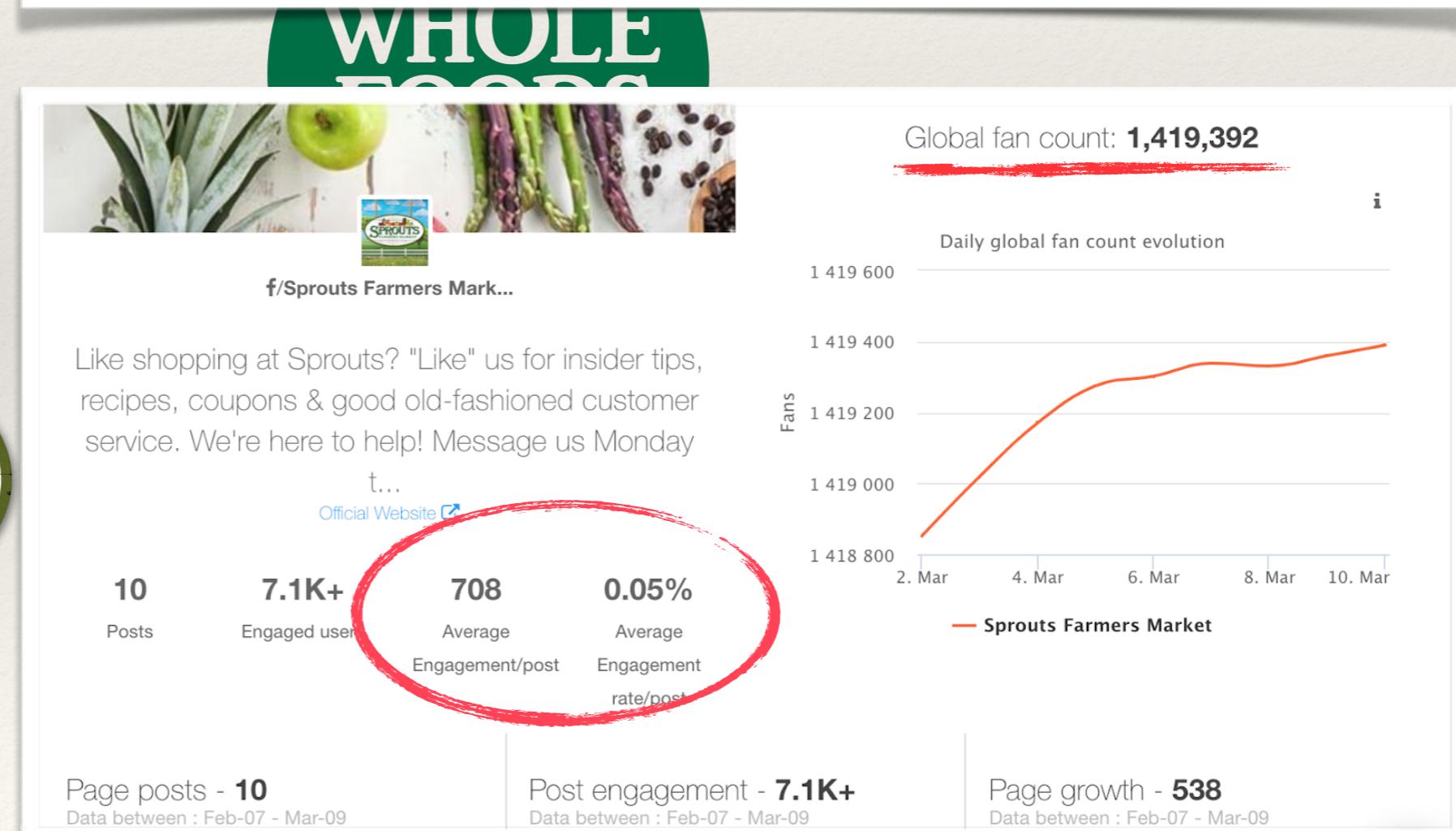
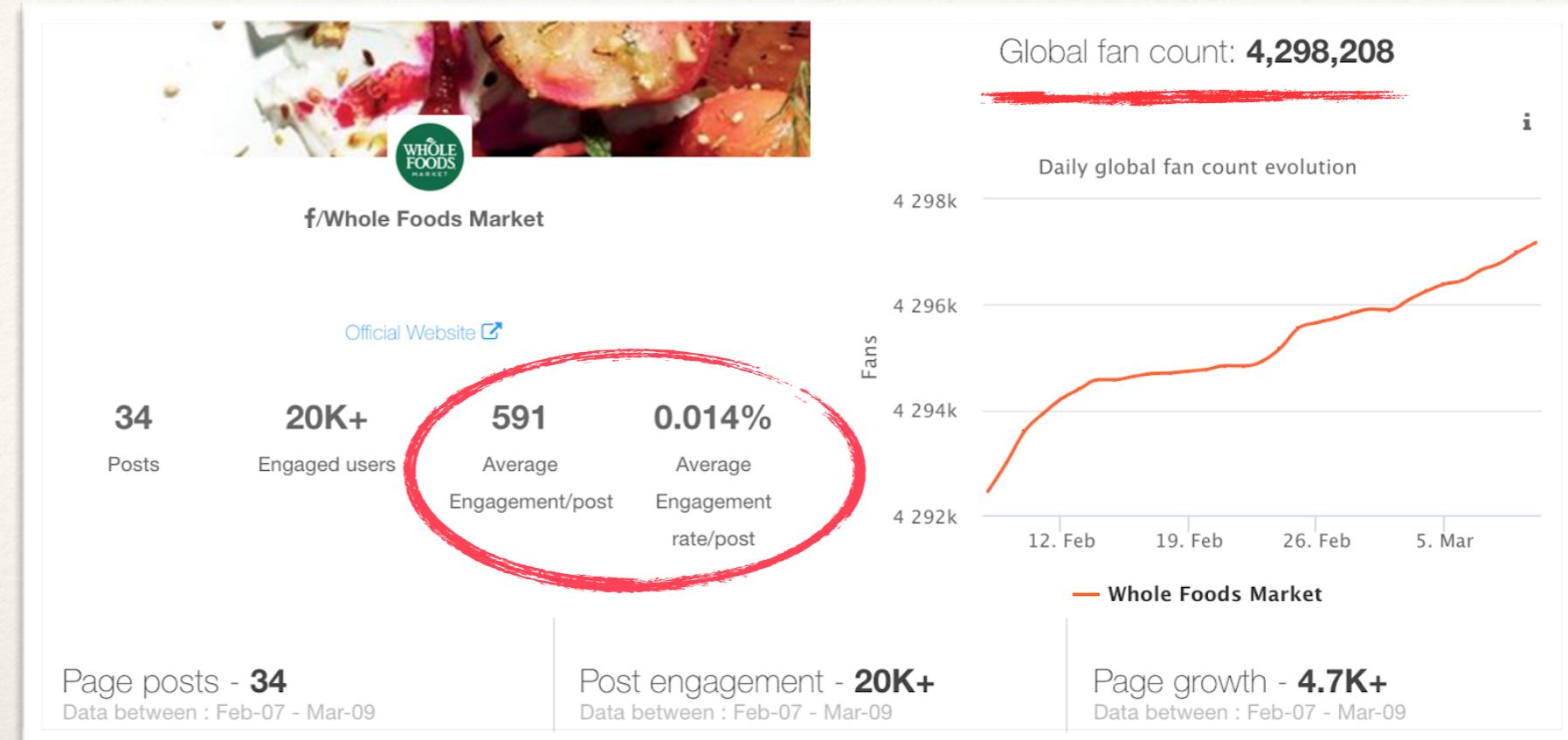


Business
Level Data



Customer
Engagement





Research Questions

***Same targets segments, different engagement level
why?***

- Length of post message
- Types of Post and their optimal number
- Contents of posts
- Contents & Types
- Contents Combination

**Weekly Aggregation
level model finding**

Individual post level model finding

Recommendations



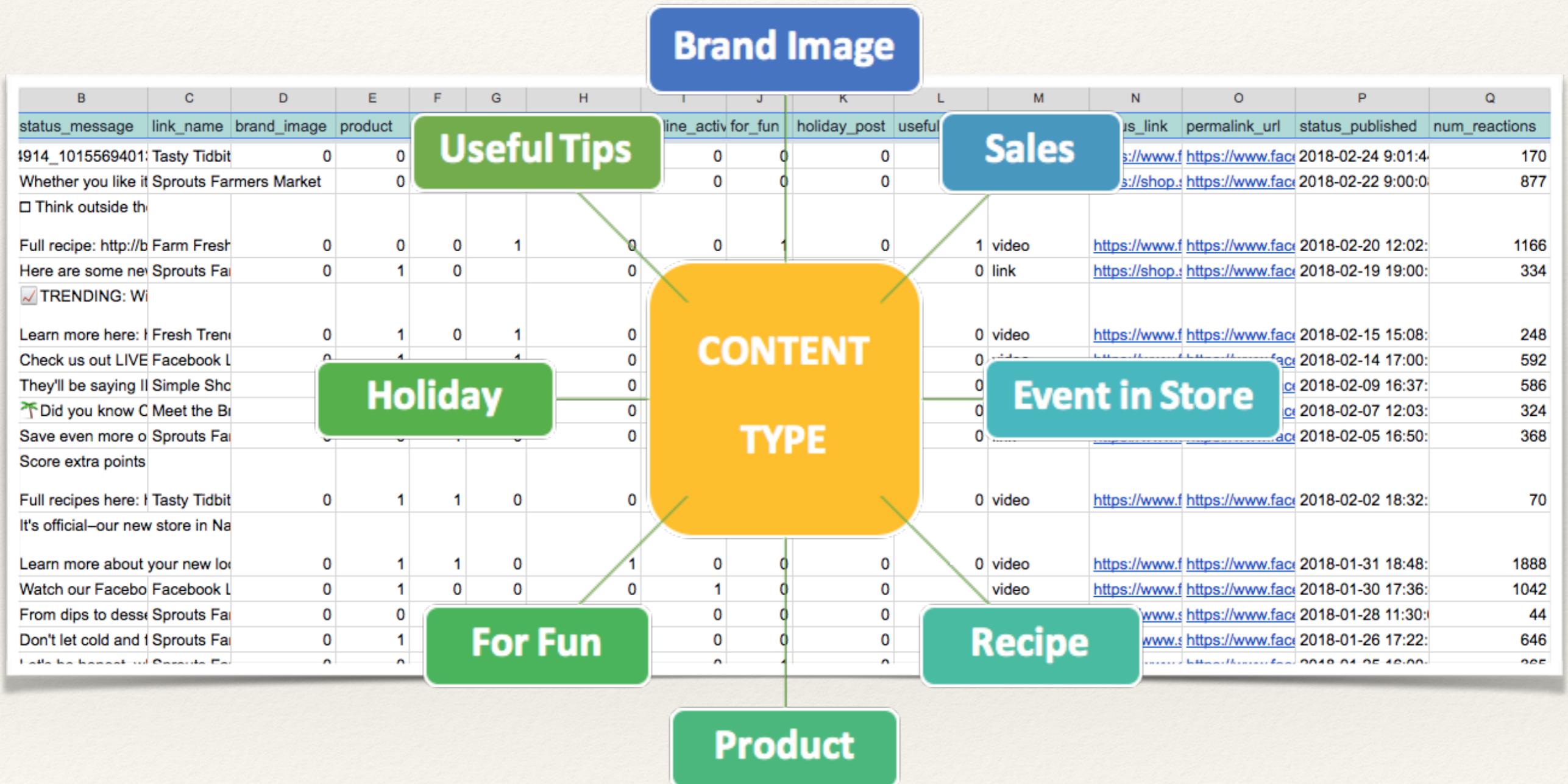
- 01** *More Videos!*
- 02** *More photo
but don't exceed 20/week*
- 03** *Making recipe links readable*
- 04** *Posts with Familiar things*
- 05** *Promote in Video Type*

Data Generating Process

Data Source and Acquisition

```
49     # retrieve data
50     data = json.loads(request_until_succeed(url))
51
52     return data
53
54 def getReactionsForStatus(status_id, access_token):
55
56     # See http://stackoverflow.com/a/37239851 for Reactions parameters
57     # Reactions are only accessible at a single-post endpoint
58
59     base = "https://graph.facebook.com/v2.6"
60     node = "%s" % status_id
61     reactions = "/?fields=" \
62         "reactions.type(LIKE).limit(0).summary(total_count).as(like)" \
63         ",reactions.type(LOVE).limit(0).summary(total_count).as(love)" \
64         ",reactions.type(WOW).limit(0).summary(total_count).as(wow)" \
65         ",reactions.type(HAHA).limit(0).summary(total_count).as(haha)" \
66         ",reactions.type(SAD).limit(0).summary(total_count).as(sad)" \
67         ",reactions.type(ANGRY).limit(0).summary(total_count).as(angry)"
68     parameters = "&access_token=%s" % access_token
69     url = base + node + reactions + parameters
70
71     # retrieve data
72     data = json.loads(request_until_succeed(url))
73
74     return data
75
```

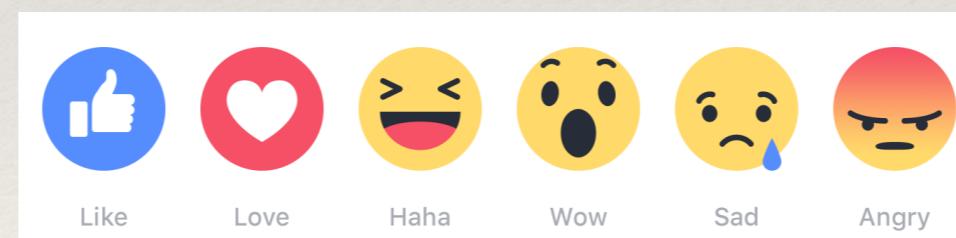
Single Post With Features Data Snapshot



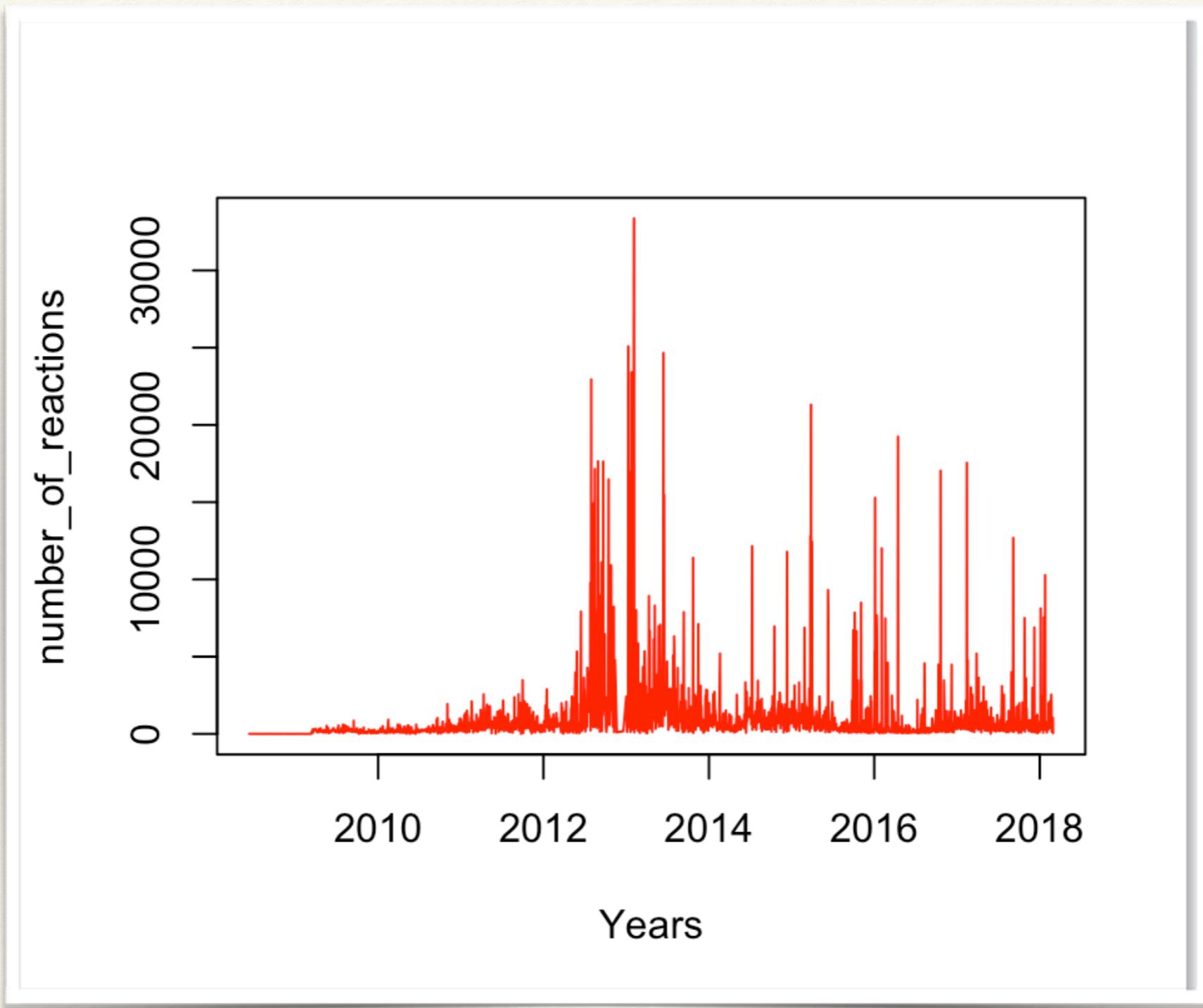
Customer Engagement

Engagement Reaction Score

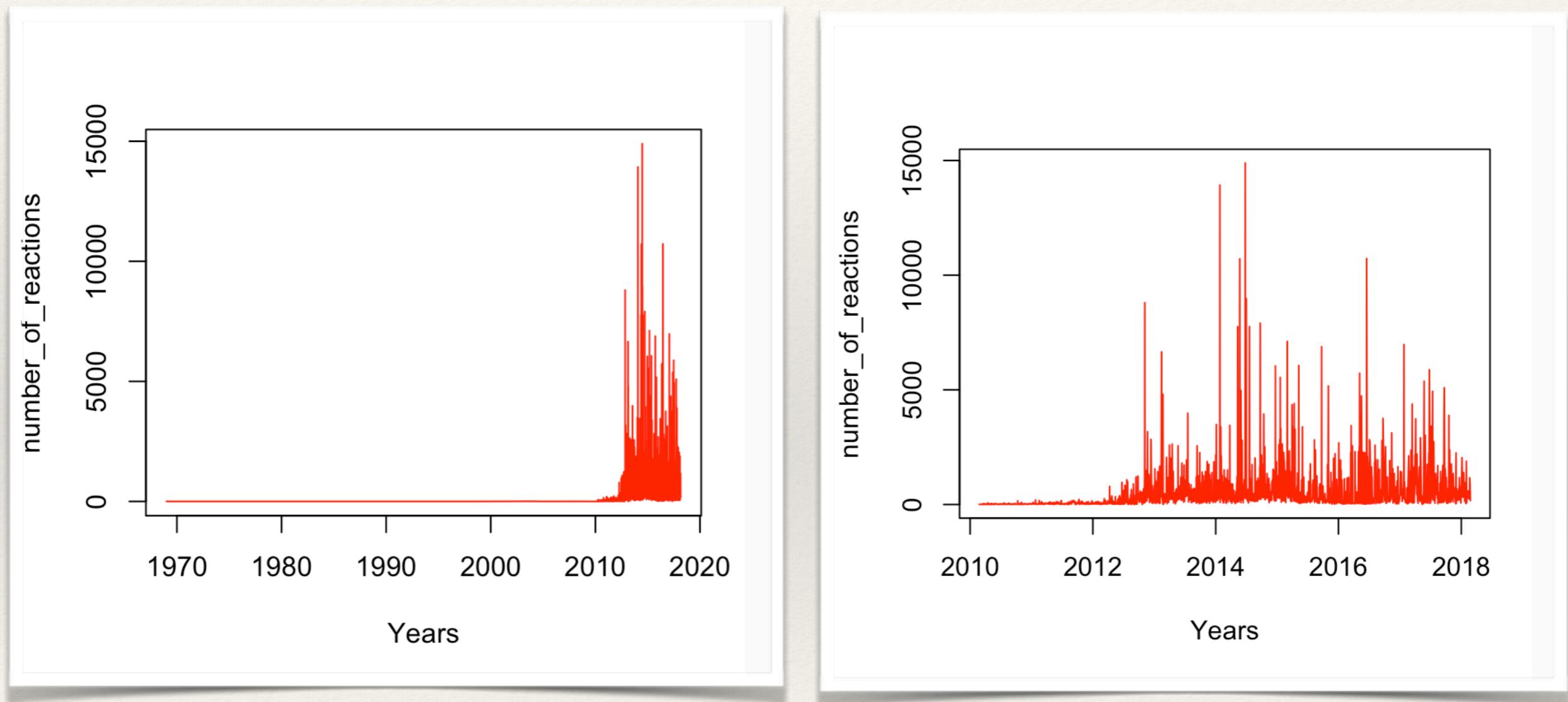
6 types of engagement Reactions



Reactions over time -Wholefoods



Reactions over time -Sprouts



Wholefoods_weekly Model

$$NumofReactions = \beta_0 + \beta_1 PostLength + \beta_2 VideoNum + \beta_3 LinkNum + \beta_4 (LinkNum)^2$$

$$+ \beta_5 EventNum + \beta_6 StatusNum + \beta_7 (StatusNum)^2 + \beta_8 OfferNum + \beta_9 PhotoNum + \beta_{10} (PhotoNum)^2$$

$$+ \beta_{11} log(ReacLag1 + 1) + \beta_{12} Seasonality + \beta_{13} (PostLength * Seasonality) + \beta_{14} (StatusNum * Seasonality)$$

Weekly @Whole Foods

OLS

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.158e+00	3.140e-01	10.059	< 2e-16 ***
post_len	-1.408e-02	3.409e-03	-4.130	4.29e-05 ***
video_num	7.147e-02	1.789e-02	3.996	7.48e-05 ***
I(link_num^2)	-1.218e-02	2.628e-03	-4.636	4.60e-06 ***
link_num	2.395e-01	3.003e-02	7.976	1.14e-14 ***
event_num	4.447e-01	2.543e-01	1.748	0.081028 .
I(status_num^2)	-1.176e-02	2.781e-02	-0.423	0.672560
offer_num	1.863e-01	1.720e-01	1.083	0.279349
status_num	2.000e-01	9.307e-02	2.149	0.032133 *
photo_num	1.716e-01	2.370e-02	7.238	1.85e-12 ***
I(photo_num^2)	-4.194e-03	1.143e-03	-3.671	0.000269 ***
log(ReacLag1 + 1)	3.997e-01	3.365e-02	11.878	< 2e-16 ***
weeknum	4.127e-03	1.963e-03	2.102	0.036078 *
I(weeknum^2)	-5.241e-06	3.535e-06	-1.482	0.138877
year_2012	1.009e-01	1.615e-01	0.625	0.532346
year_2013	3.658e-01	1.214e-01	3.012	0.002733 **
year_2008	-1.884e+00	2.615e-01	-7.204	2.31e-12 ***
month_12.0	-7.027e-01	1.559e-01	-4.506	8.32e-06 ***
post_len:month_12.0	1.196e-02	3.845e-03	3.110	0.001982 **
status_num:year_2012	-1.011e-01	9.709e-02	-1.041	0.298442

Signif. codes:	0	'***'	0.001	'**'
			0.01	'*'
			0.05	'.'
			0.1	' '
			1	

Residual standard error: 0.6939 on 475 degrees of freedom
 Multiple R-squared: 0.8664, Adjusted R-squared: 0.8611
 F-statistic: 162.2 on 19 and 475 DF, p-value: < 2.2e-16

Negative Binomial

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	3.765e+00	3.052e-01	12.337	< 2e-16 ***
post_len	-6.967e-03	3.409e-03	-2.043	0.041004 *
video_num	7.628e-02	1.674e-02	4.557	5.19e-06 ***
I(link_num^2)	-8.950e-03	2.449e-03	-3.655	0.000257 ***
link_num	1.946e-01	2.799e-02	6.954	3.54e-12 ***
event_num	2.521e-01	2.368e-01	1.065	0.287078
I(status_num^2)	-1.782e-02	2.596e-02	-0.686	0.492487
offer_num	1.005e-01	1.601e-01	0.628	0.529929
status_num	2.137e-01	8.682e-02	2.461	0.013848 *
photo_num	1.927e-01	2.208e-02	8.724	< 2e-16 ***
I(photo_num^2)	-5.299e-03	1.064e-03	-4.980	6.34e-07 ***
log(ReacLag1 + 1)	3.212e-01	3.168e-02	10.141	< 2e-16 ***
weeknum	3.074e-03	1.848e-03	1.663	0.096326 .
I(weeknum^2)	-1.385e-06	3.312e-06	-0.418	0.675834
year_2012	4.012e-01	1.505e-01	2.666	0.007678 **
year_2013	5.599e-01	1.132e-01	4.946	7.58e-07 ***
year_2008	-3.086e+00	3.058e-01	-10.092	< 2e-16 ***
month_12.0	-6.060e-01	1.573e-01	-3.852	0.000117 ***
post_len:month_12.0	5.204e-03	4.663e-03	1.116	0.264453
status_num:year_2012	-1.275e-01	9.045e-02	-1.410	0.158684

Signif. codes:	0	'***'	0.001	'**'
			0.01	'*'
			0.05	'.'
			0.1	' '
			1	

(Dispersion parameter for Negative Binomial(2.3989) family taken to be 1)

Null deviance: 2070.6 on 494 degrees of freedom
 Residual deviance: 533.8 on 475 degrees of freedom
 AIC: 8697.5

Sprouts_weekly Model

$$NumofReactions = \beta_0 + \beta_1 PostLength + \beta_2 VideoNum + \beta_3 (VideoNum)^2 + \beta_4 LinkNum + \beta_5 (LinkNum)^2$$

$$+ \beta_6 EventNum + \beta_7 StatusNum + \beta_8 PhotoNum + \beta_9 (PhotoNum)^2 + \beta_{10} WeekNum + \beta_{11} (WeekNum)^2$$

$$+ \beta_{12} log(ReacLag1 + 1) + \beta_{13} Seasonality$$

Weekly @Sprouts

OLS

Residuals:

Min	1Q	Median	3Q	Max
-2.76790	-0.32006	0.01841	0.43394	2.52637

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)							
(Intercept)	3.964e+00	6.243e-01	6.350	5.78e-10 ***							
post_len	8.016e-03	3.322e-03	2.413	0.016268 *							
video_num	2.203e-02	1.013e-01	0.217	0.828024							
I(video_num^2)	4.944e-02	2.450e-02	2.018	0.044243 *							
I(link_num^2)	-1.293e-02	1.577e-02	-0.819	0.413010							
link_num	1.160e-01	7.305e-02	1.588	0.113013							
event_num	7.493e-02	7.641e-02	0.981	0.327361							
status_num	1.846e-01	3.497e-02	5.279	2.12e-07 ***							
photo_num	1.216e-01	3.579e-02	3.396	0.000750 ***							
I(photo_num^2)	-2.530e-03	2.169e-03	-1.167	0.244042							
log(ReacLag1 + 1)	1.797e-01	4.397e-02	4.087	5.27e-05 ***							
year_2010	-1.981e+00	4.553e-01	-4.351	1.71e-05 ***							
year_2011	-1.504e+00	3.230e-01	-4.655	4.39e-06 ***							
year_2012	-8.051e-01	2.091e-01	-3.850	0.000137 ***							
year_2014	3.322e-01	1.309e-01	2.539	0.011490 *							
weeknum	8.435e-03	4.281e-03	1.970	0.049478 *							
I(weeknum^2)	-1.230e-05	7.673e-06	-1.603	0.109764							

Signif. codes:	0	'***'	0.001	'**'	0.01	'*'	0.05	'.'	0.1	' '	1

Residual standard error: 0.7329 on 406 degrees of freedom

Multiple R-squared: 0.8076, Adjusted R-squared: 0.8

F-statistic: 106.5 on 16 and 406 DF, p-value: < 2.2e-16

Negative Binomial

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	1.672e+00	2.725e-01	6.136	8.47e-10 ***
post_len	8.813e-03	3.011e-03	2.927	0.00343 **
video_num	-1.492e-01	9.354e-02	-1.595	0.11080
I(video_num^2)	7.036e-02	2.262e-02	3.110	0.00187 **
I(link_num^2)	-2.620e-02	1.446e-02	-1.812	0.07004 .
link_num	1.740e-01	6.671e-02	2.608	0.00910 **
event_num	1.006e-01	7.019e-02	1.433	0.15173
status_num	1.871e-01	3.207e-02	5.834	5.40e-09 ***
photo_num	1.083e-01	3.302e-02	3.280	0.00104 **
I(photo_num^2)	-3.269e-03	1.995e-03	-1.638	0.10139
log(ReacLag1 + 1)	1.856e-01	3.909e-02	4.748	2.05e-06 ***
year_2010	-1.531e-01	2.531e-01	-0.605	0.54520
year_2011	-3.984e-01	2.063e-01	-1.931	0.05343 .
year_2012	-1.495e-01	1.665e-01	-0.898	0.36911
year_2014	3.350e-01	1.208e-01	2.773	0.00556 **
weeknum	2.673e-02	2.909e-03	9.190	< 2e-16 ***
I(weeknum^2)	-4.122e-05	5.662e-06	-7.280	3.35e-13 ***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Negative Binomial(2.1843) family taken to be 1)

Null deviance: 1764.21 on 429 degrees of freedom

Residual deviance: 465.82 on 413 degrees of freedom

AIC: 6926.2

Final Aggregate Level Model with Robust SE

Wholefoods_nb

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	3.7647e+00	3.6719e-01	10.2526	< 2.2e-16 ***
post_len	-6.9668e-03	3.7617e-03	-1.8521	0.0640158 .
video_num	7.6281e-02	1.9127e-02	3.9881	6.660e-05 ***
I(link_num^2)	-8.9498e-03	2.9750e-03	-3.0084	0.0026266 **
link_num	1.9463e-01	3.4520e-02	5.6384	1.717e-08 ***
event_num	2.5210e-01	1.8747e-01	1.3448	0.1787024
I(status_num^2)	-1.7819e-02	2.3707e-02	-0.7516	0.4522809
offer_num	1.0054e-01	4.1340e-02	2.4322	0.0150094 *
status_num	2.1369e-01	8.6639e-02	2.4664	0.0136477 *
photo_num	1.9267e-01	2.6467e-02	7.2795	3.351e-13 ***
I(photo_num^2)	-5.2991e-03	1.1674e-03	-4.5392	5.648e-06 ***
log(ReacLag1 + 1)	3.2123e-01	4.9568e-02	6.4806	9.138e-11 ***
weeknum	3.0738e-03	2.1111e-03	1.4560	0.1453926
I(weeknum^2)	-1.3851e-06	3.9455e-06	-0.3511	0.7255430
year_2012	4.0115e-01	1.4879e-01	2.6961	0.0070157 **
year_2013	5.5989e-01	1.3236e-01	4.2300	2.337e-05 ***
year_2008	-3.0862e+00	2.8401e-01	-10.8668	< 2.2e-16 ***
month_12.0	-6.0597e-01	1.7219e-01	-3.5192	0.0004329 ***
post_len:month_12.0	5.2038e-03	4.0813e-03	1.2751	0.2022892
status_num:year_2012	-1.2749e-01	8.6665e-02	-1.4711	0.1412716

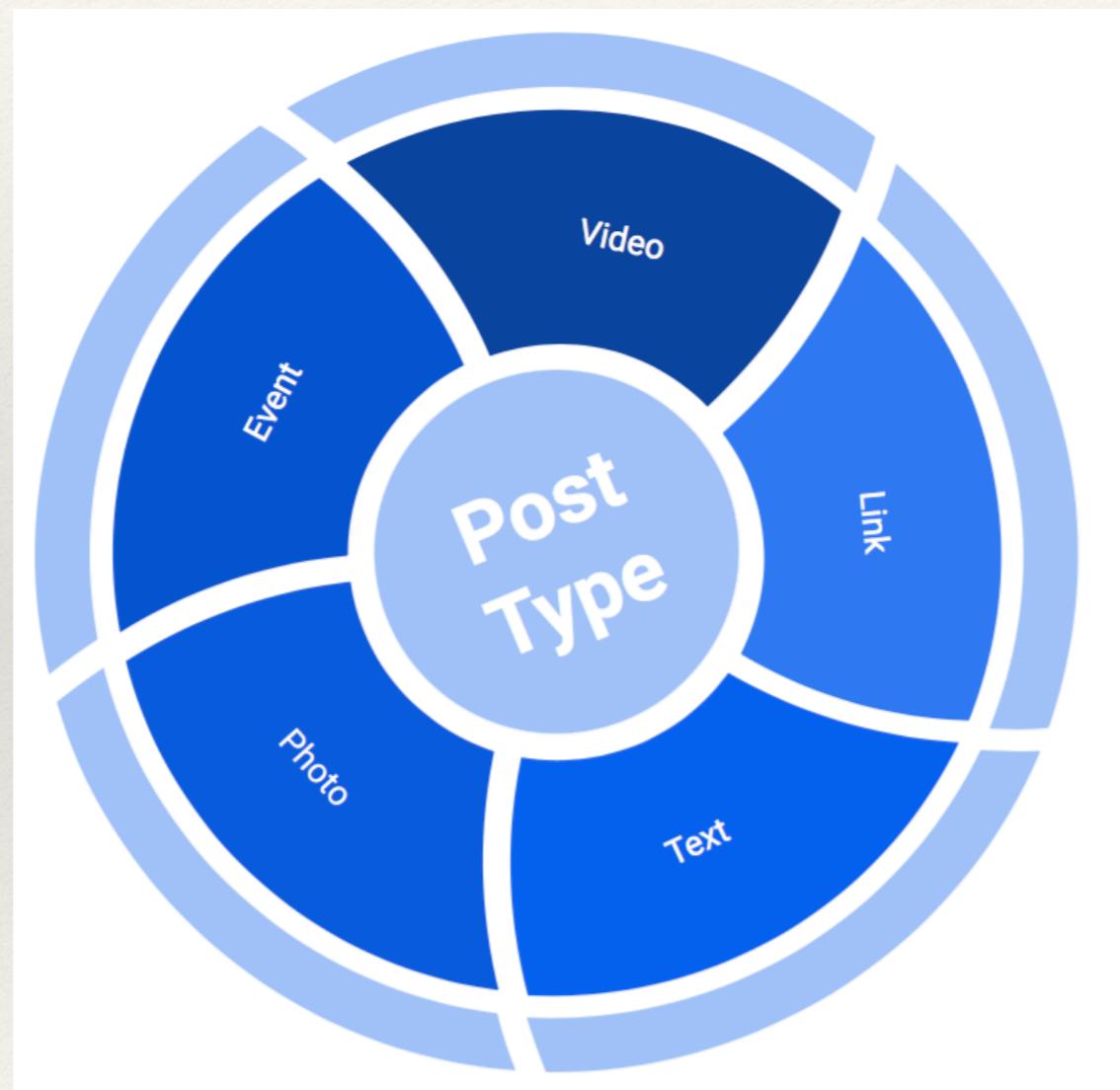
Signif. codes:	0 ****	0.001 **	0.01 *	0.05 .
	1			

Sprouts_lm

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.9644e+00	7.6272e-01	5.1977	3.203e-07 ***
post_len	8.0160e-03	3.7149e-03	2.1578	0.0315288 *
video_num	2.2026e-02	1.1647e-01	0.1891	0.8501033
I(video_num^2)	4.9436e-02	2.1554e-02	2.2936	0.0223249 *
I(link_num^2)	-1.2927e-02	1.1654e-02	-1.1092	0.2679856
link_num	1.1602e-01	7.0429e-02	1.6474	0.1002561
event_num	7.4929e-02	5.6828e-02	1.3185	0.1880719
status_num	1.8462e-01	3.5957e-02	5.1345	4.398e-07 ***
photo_num	1.2156e-01	3.7676e-02	3.2265	0.0013545 **
I(photo_num^2)	-2.5304e-03	2.0837e-03	-1.2144	0.2253117
log(ReacLag1 + 1)	1.7971e-01	5.1449e-02	3.4929	0.0005303 ***
year_2010	-1.9813e+00	4.4837e-01	-4.4189	1.275e-05 ***
year_2011	-1.5035e+00	3.0878e-01	-4.8693	1.607e-06 ***
year_2012	-8.0505e-01	2.0053e-01	-4.0146	7.093e-05 ***
year_2014	3.3224e-01	1.1873e-01	2.7982	0.0053835 **
weeknum	8.4354e-03	5.0644e-03	1.6656	0.0965591 .
I(weeknum^2)	-1.2298e-05	9.0474e-06	-1.3592	0.1748256

Signif. codes:	0 ****	0.001 **	0.01 *	0.05 .
	1			

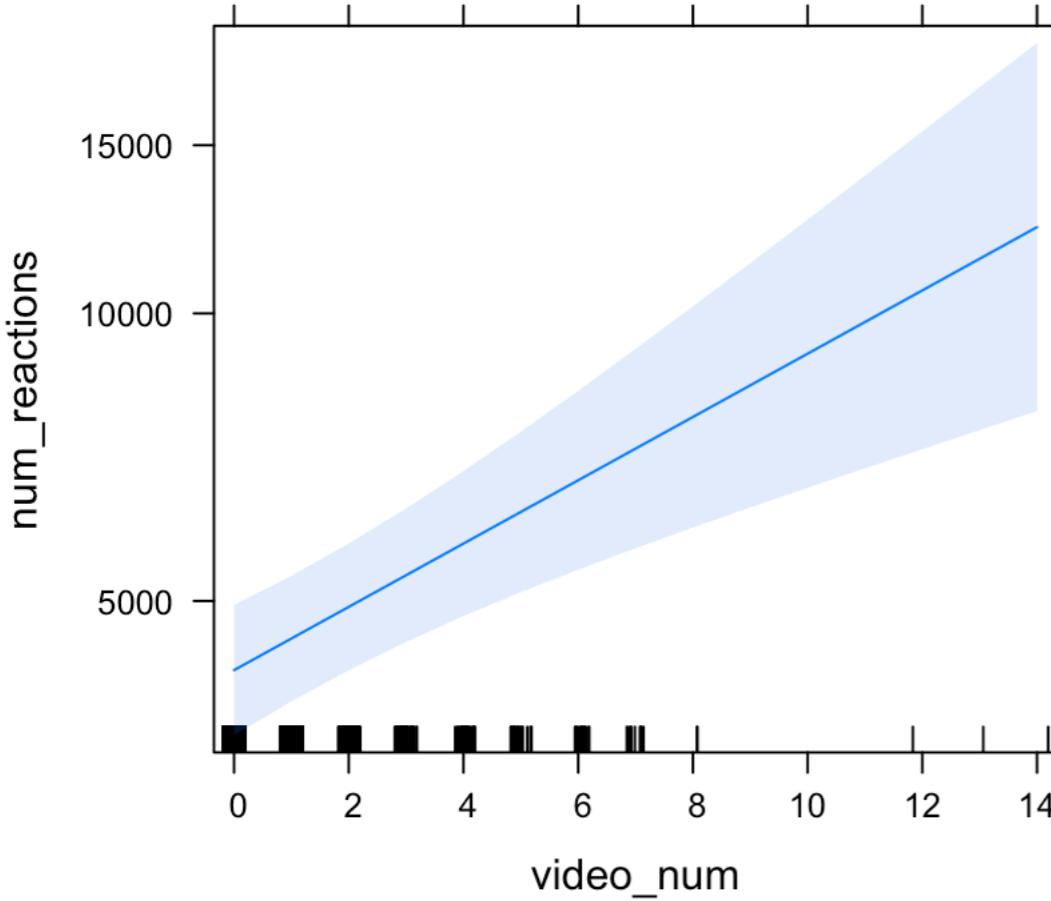
Findings



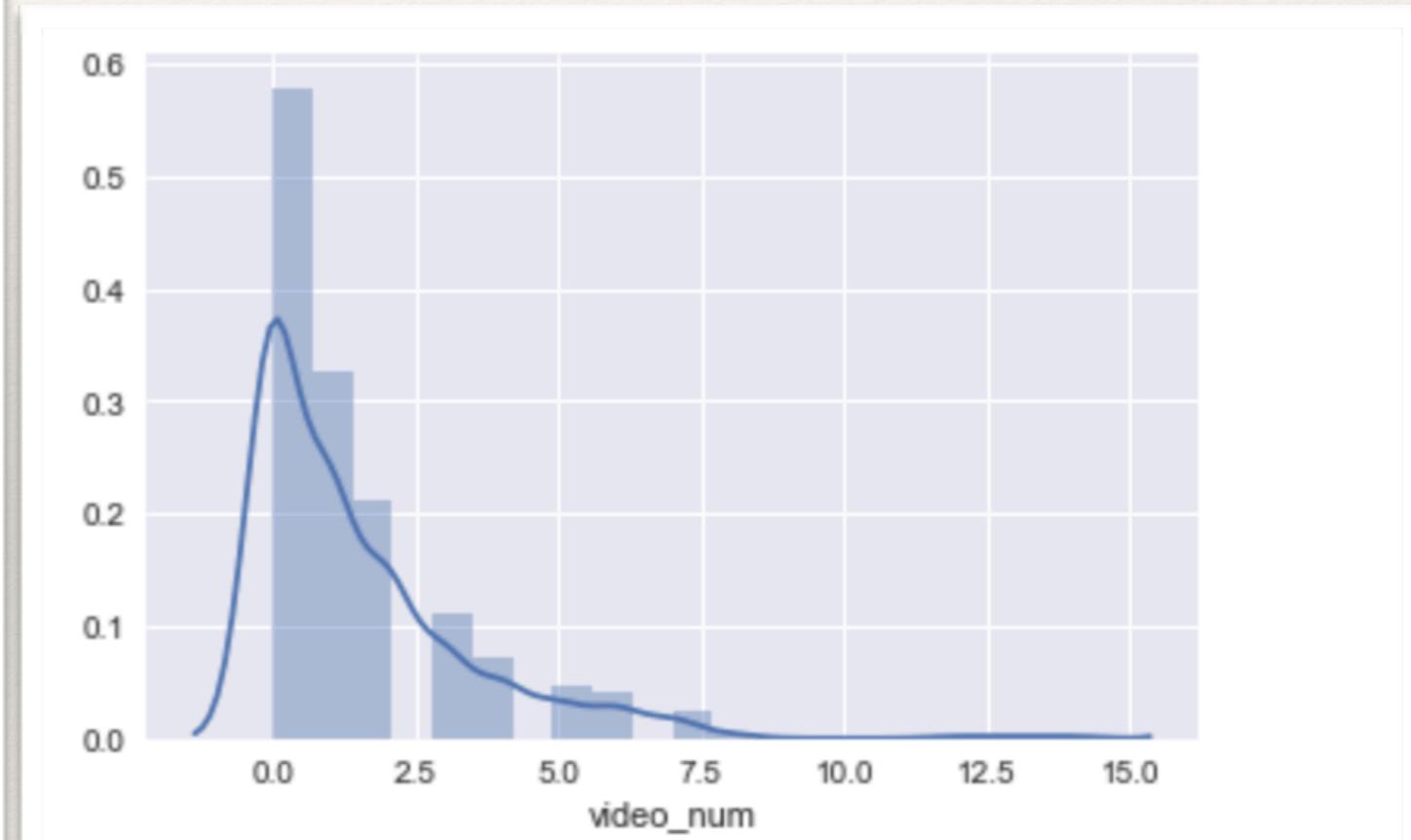
Video Number - Video is well welcomed!

Wholefoods Video Number

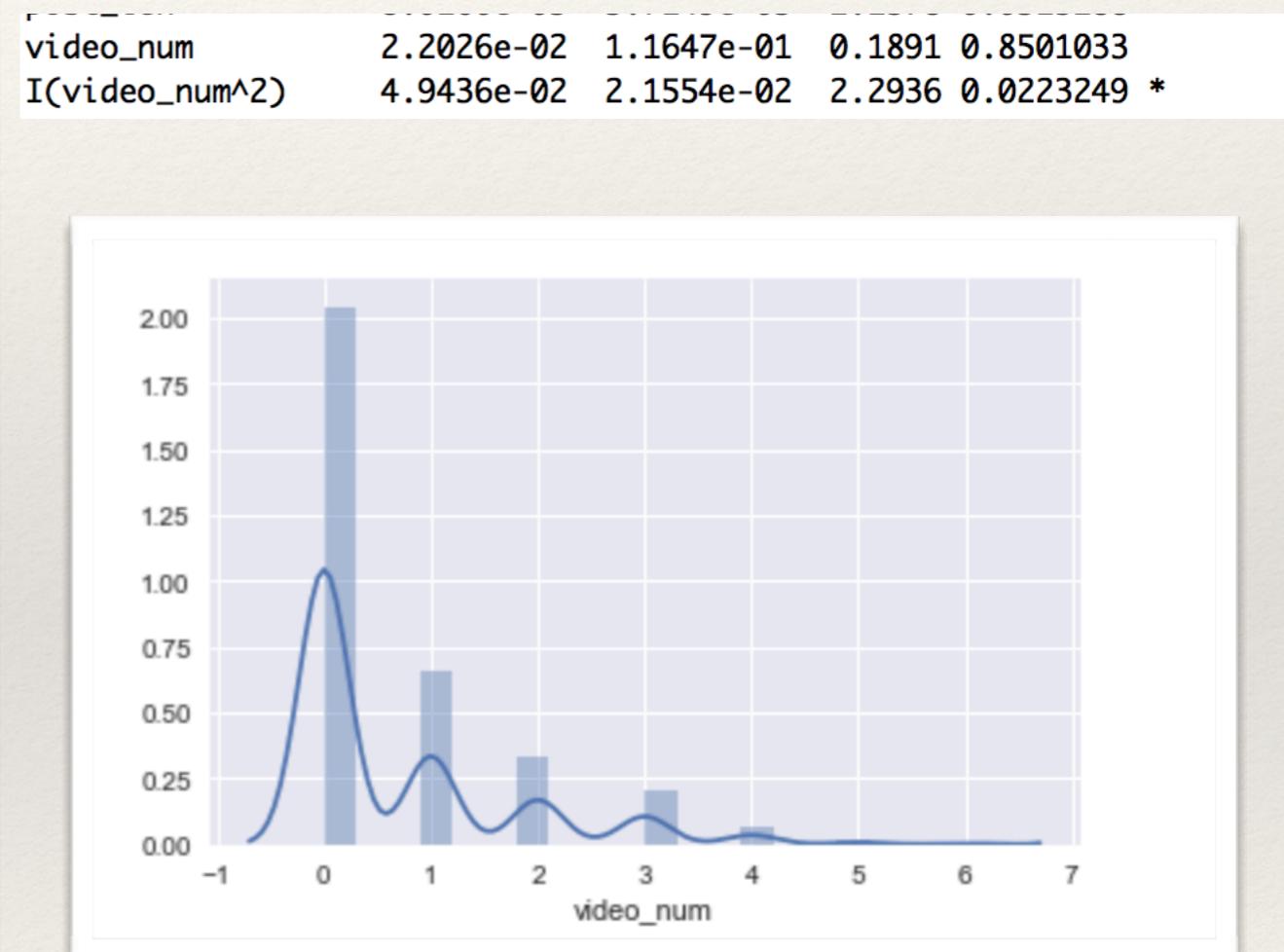
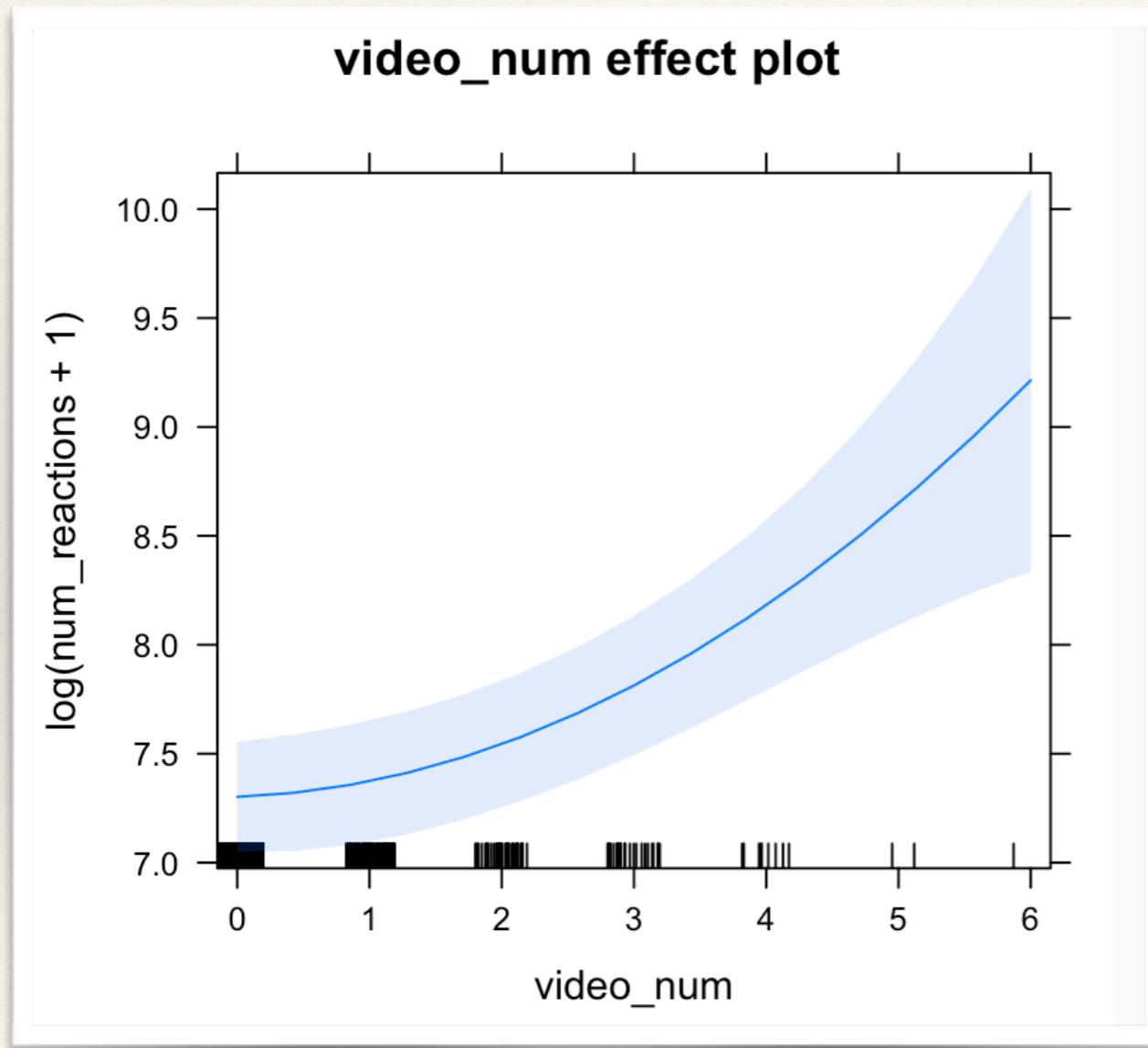
video_num effect plot



video_num 7.6281e-02 1.9127e-02 3.9881 6.660e-05 ***

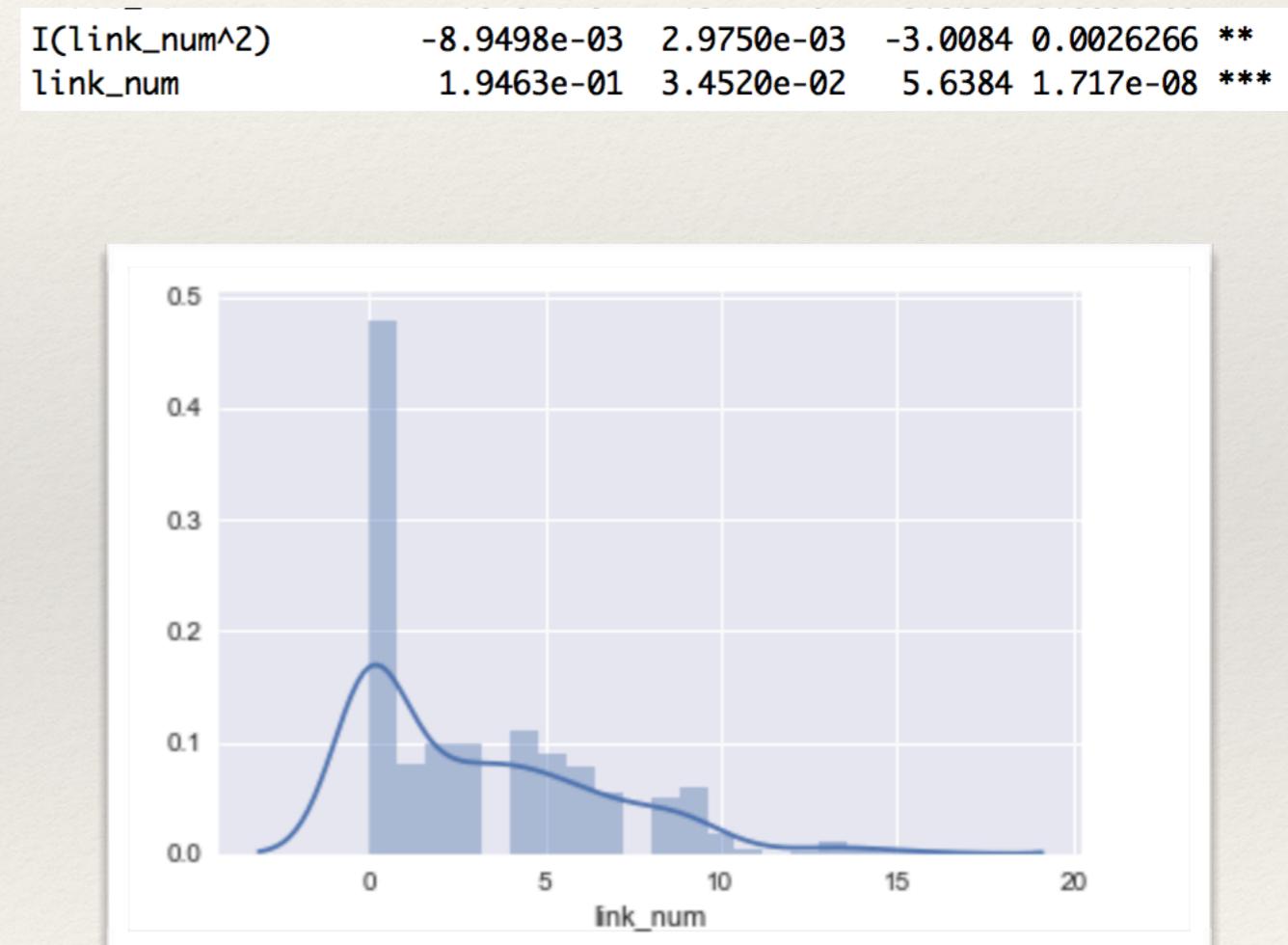
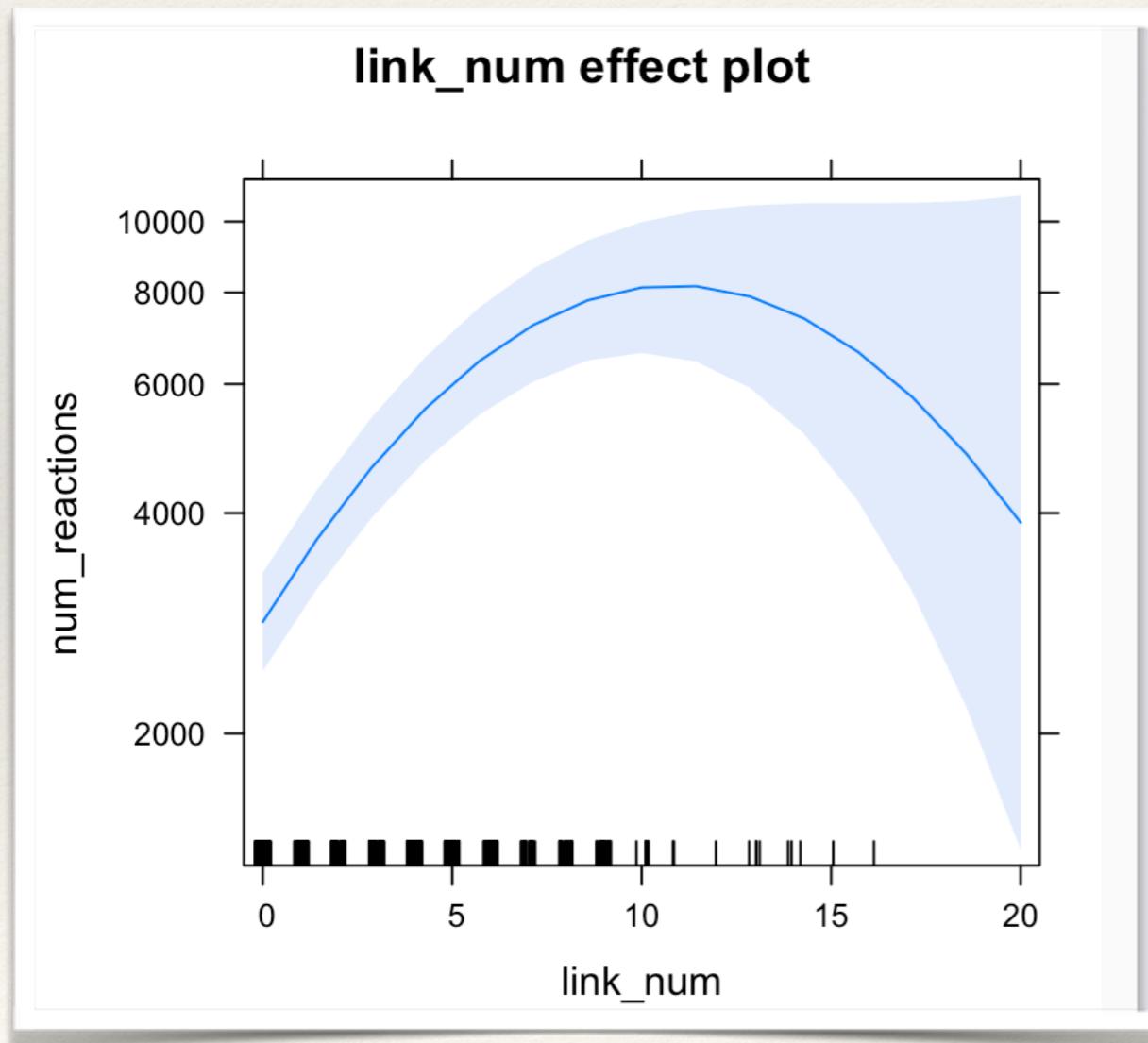


Sprouts Video Number



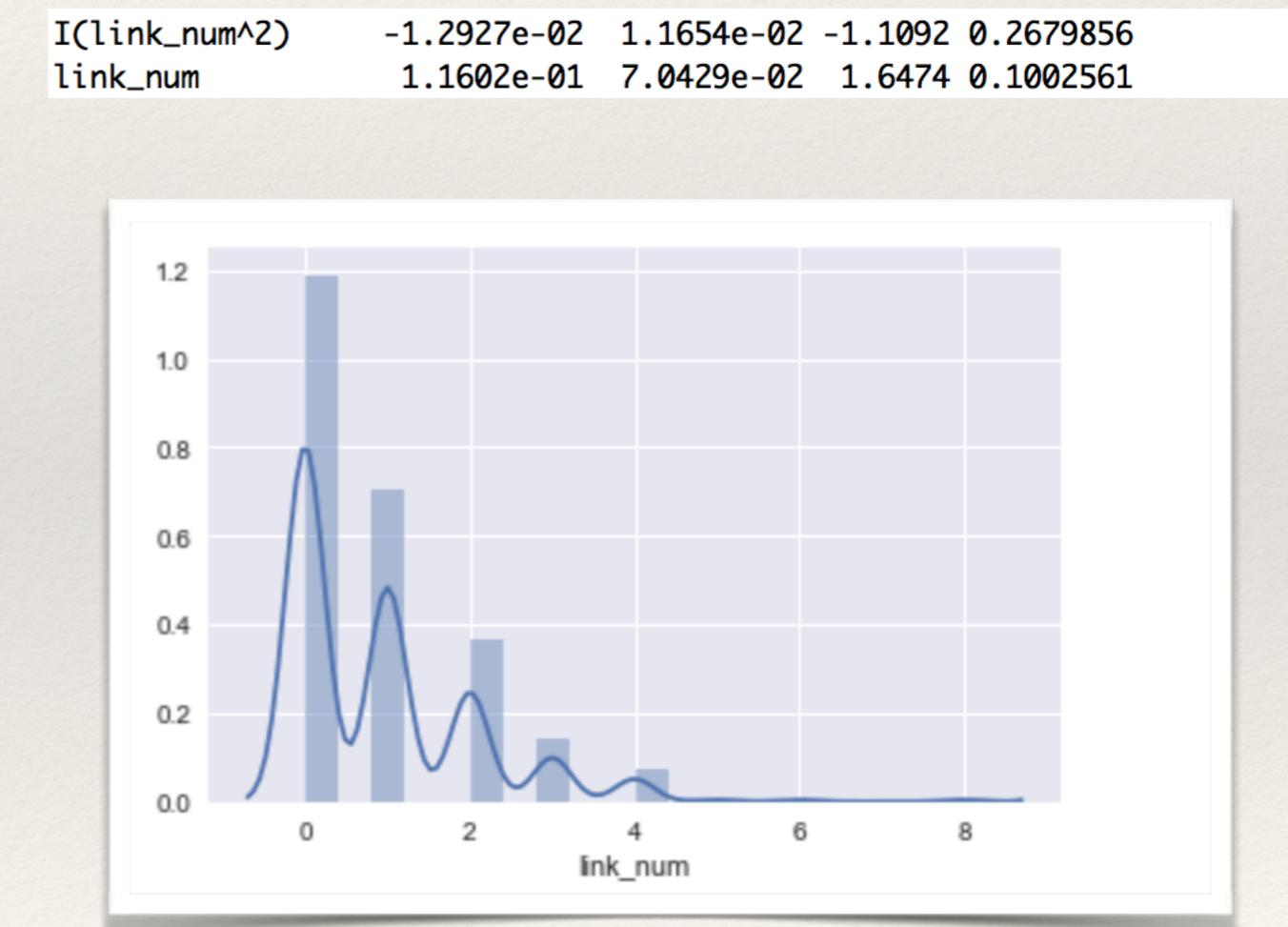
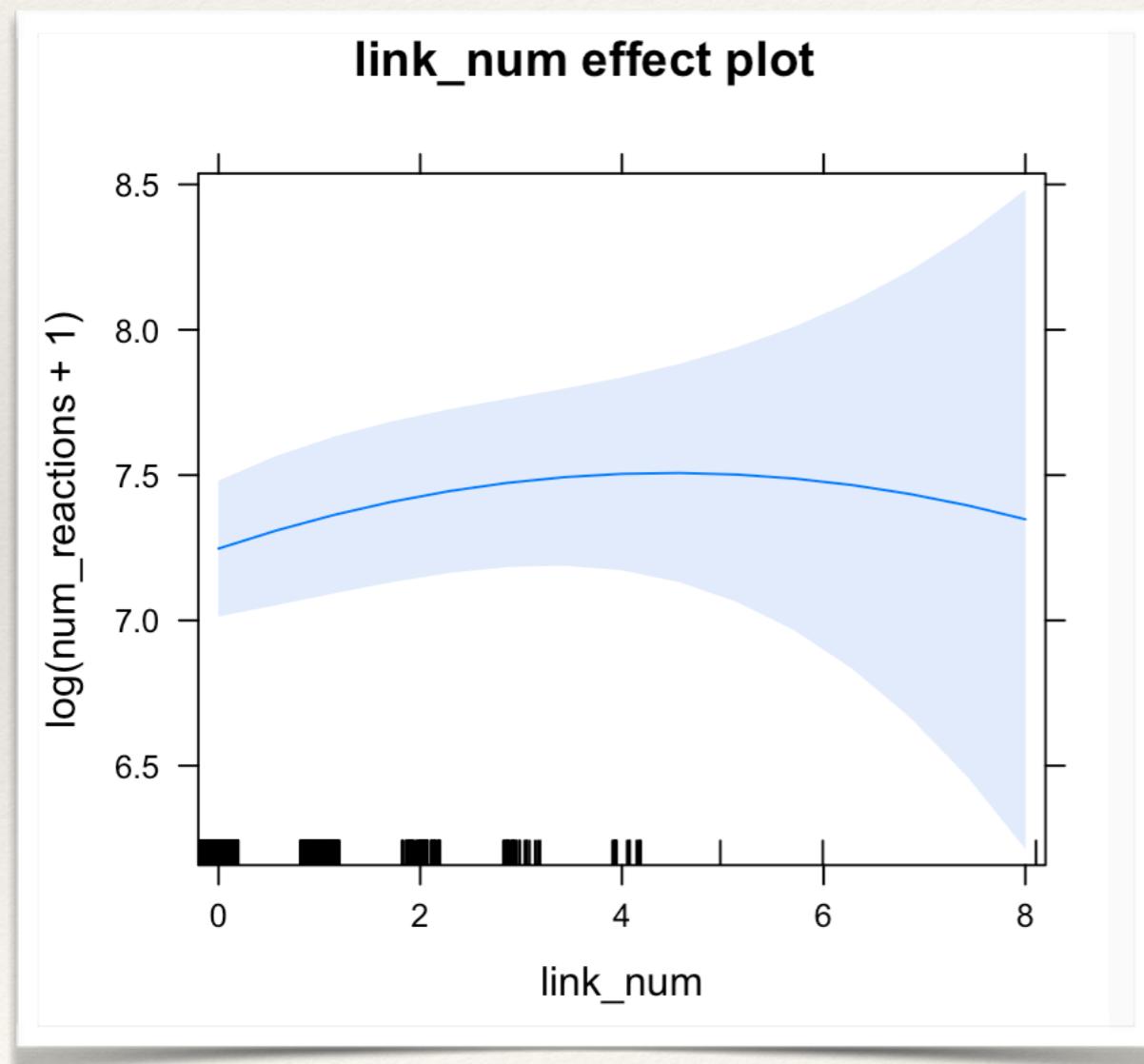
Wholefoods Link Number

10-12 / week



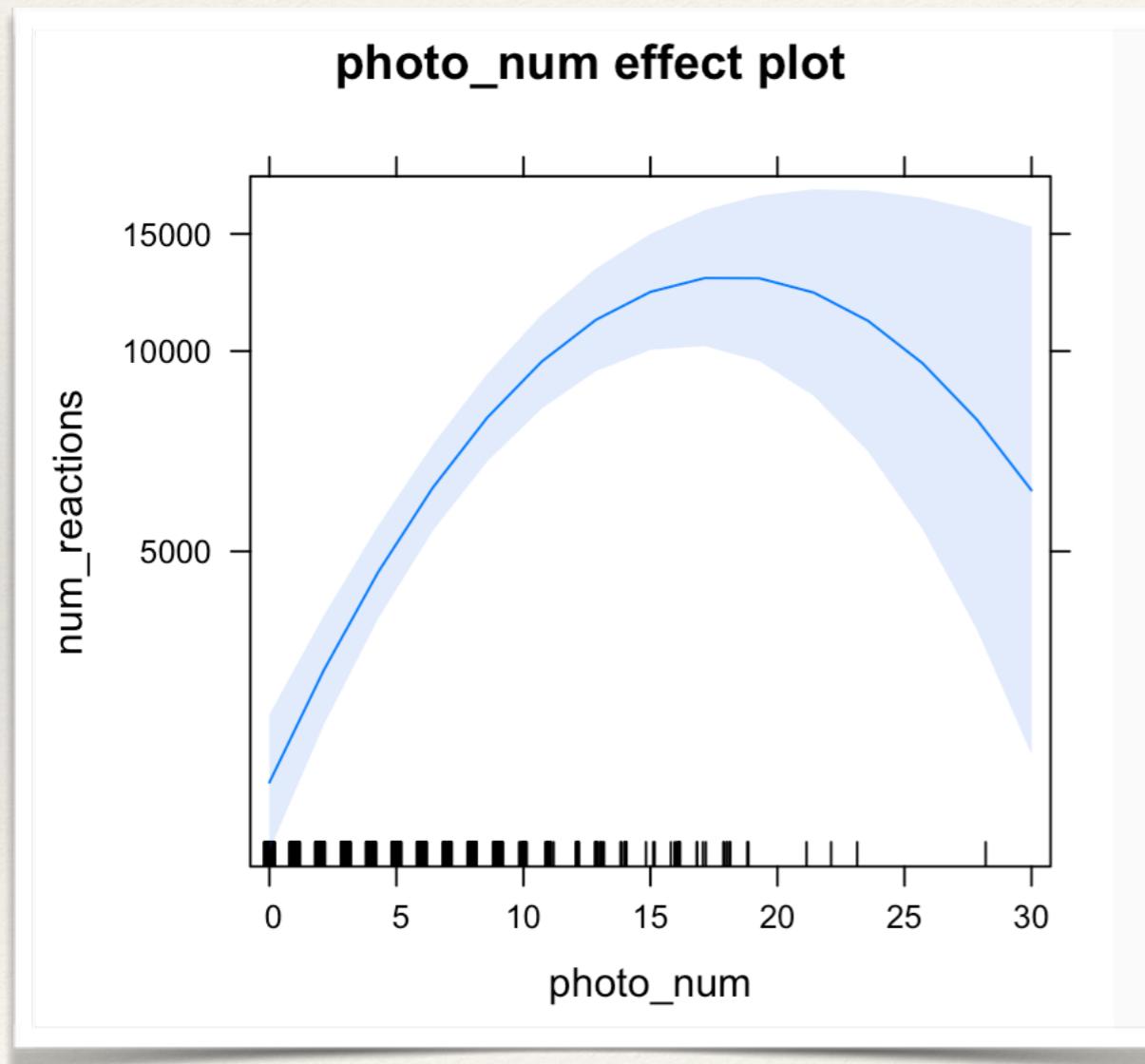
Sprouts Link Number

4/week

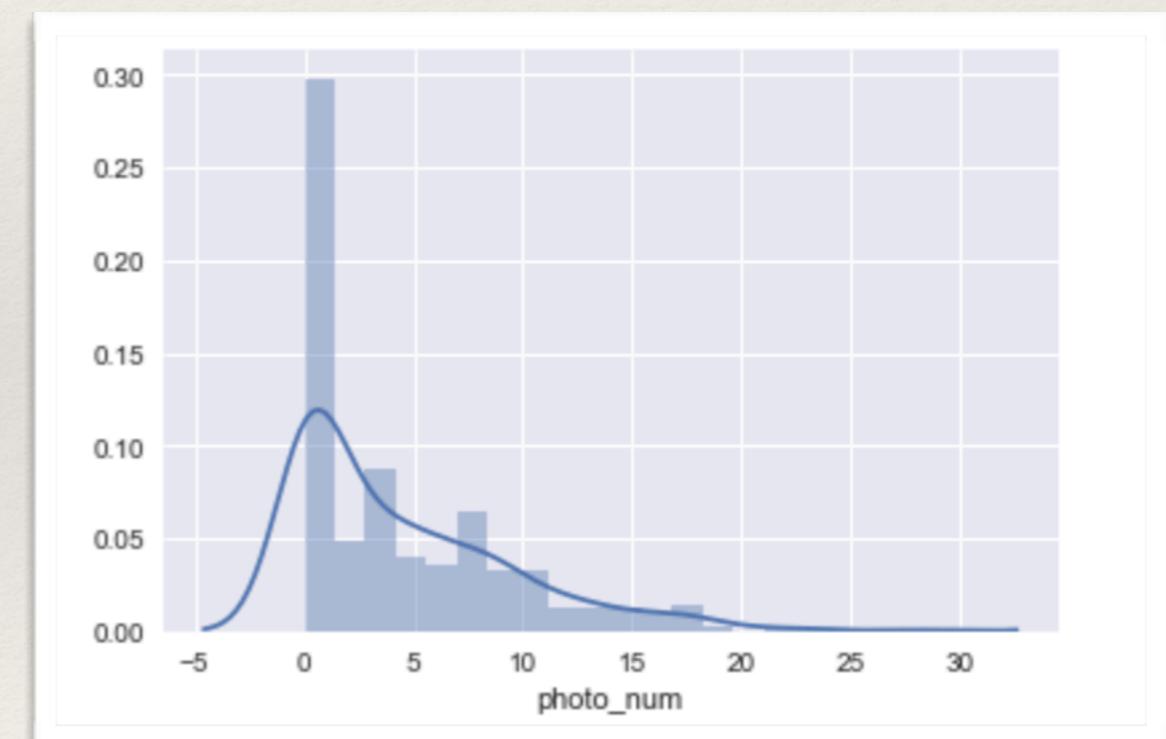


Wholefoods Photo Number

17/week

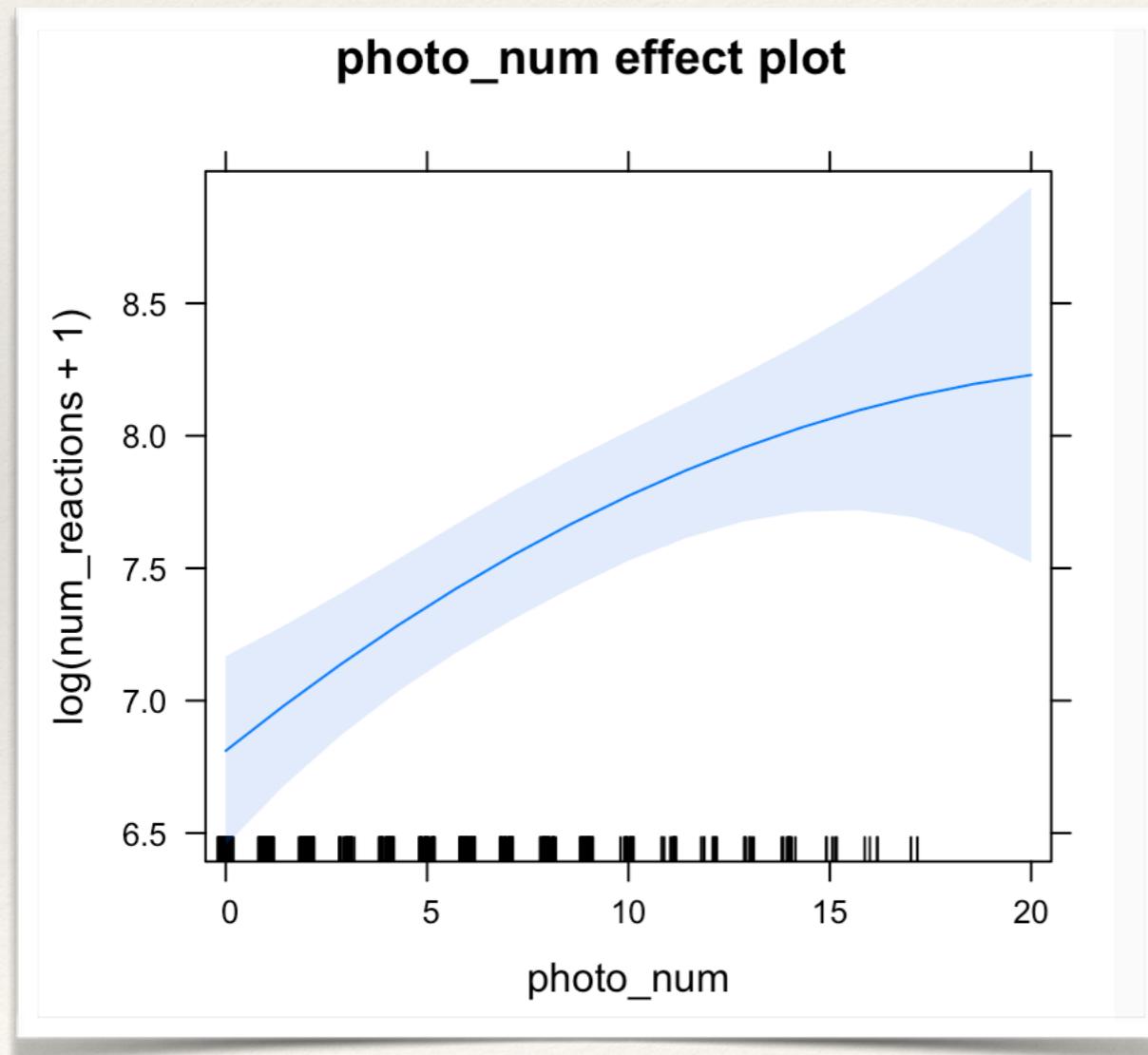


photo_num	1.927e-01	2.208e-02	8.724	< 2e-16 ***
I(photo_num^2)	-5.299e-03	1.064e-03	-4.980	6.34e-07 ***

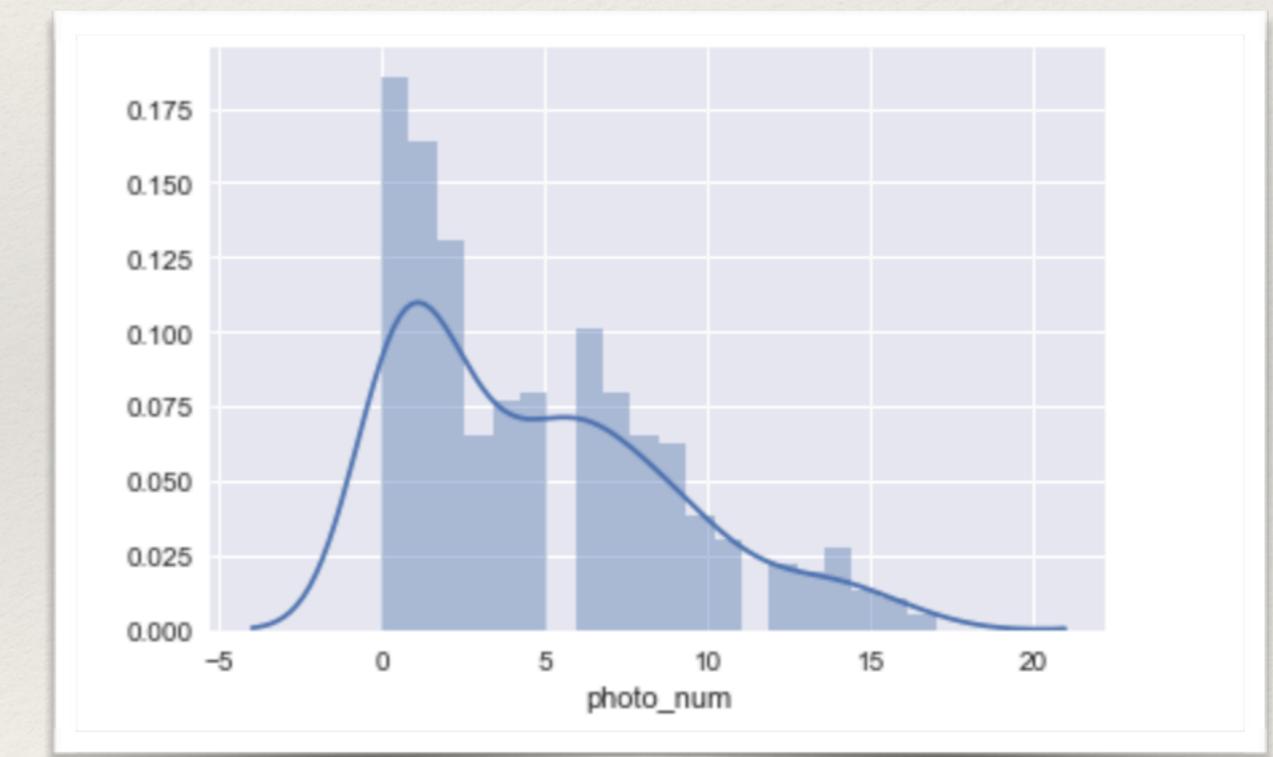


Sprouts Photo Number

More photo preferred



photo_num	1.216e-01	3.579e-02	3.396	0.000750	***
I(photo_num^2)	-2.530e-03	2.169e-03	-1.167	0.244042	



Why the difference

- ❖ both videos are popular.
- ❖ Different content leads to different result.
- ❖ Gain deeper insights for post content.

→ so we'll continuing to introduce Single post models

Wholefoods Single Post Model

$$\begin{aligned} \text{NumofReactions} = & \beta_0 + \beta_1 \text{postlength} + \beta_2 \text{postnum} + \beta_3 (\text{postnum})^2 + \beta_4 (\text{PostFeature}) + \beta_5 (\text{PostFeature})^2 \\ & + \beta_6 (\text{ContentFeature}) + \beta_7 (\text{PostType} * \text{ContentType}) + \beta_8 (\text{Seasonality}) \end{aligned}$$

Sprouts Single Post Model:

$$\begin{aligned} \text{NumofReactions} = & \beta_0 + \beta_1 \text{postlength} + \beta_2 \text{postnum} + \beta_3 (\text{postnum})^2 + \beta_4 (\text{PostFeature}) + \beta_5 (\text{PostFeature})^2 \\ & + \beta_6 (\text{ContentFeature}) + \beta_7 (\text{PostType} * \text{ContentType}) + \beta_8 (\text{Seasonality}) \end{aligned}$$

Wholefoods Single Post

OLS

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	6.314443	0.436546	14.465	< 2e-16 ***
post_len	-0.005029	0.003781	-1.330	0.184252
I(post_num^2)	0.078792	0.035189	2.239	0.025647 *
post_num	-0.398927	0.169304	-2.356	0.018898 *
brand_image	-0.309214	0.163116	-1.896	0.058660 .
product	-0.555619	0.186135	-2.985	0.002994 **
sales	0.340966	0.131545	2.592	0.009860 **
recipe	-0.394624	0.126639	-3.116	0.001953 **
event_in_store	-0.927577	0.316955	-2.927	0.003606 **
for_fun	-0.285595	0.185905	-1.536	0.125199
online_activity	0.177222	0.308668	0.574	0.566159
holiday_post	0.201520	0.121119	1.664	0.096863 .
useful_tips	-0.920822	0.709187	-1.298	0.194825
video	0.100972	0.418229	0.241	0.809337
link	-0.281016	0.400817	-0.701	0.483606
event	0.191992	0.622935	0.308	0.758072
photo	-0.151270	0.420992	-0.359	0.719530
food_bar	2.441290	0.396837	6.152	1.73e-09 ***
Hiring	1.545991	0.454613	3.401	0.000734 ***
year_2018	0.231159	0.120023	1.926	0.054756 .
brand_image:photo	0.458367	0.347718	1.318	0.188119
brand_image:event	2.063343	0.897119	2.300	0.021918 *
brand_image:product	0.428417	0.331215	1.293	0.196528
brand_image:online_activity	1.112311	0.479911	2.318	0.020922 *
product:link	0.567384	0.209826	2.704	0.007116 **
product:online_activity	1.887595	0.681104	2.771	0.005819 **
sales:event_in_store	1.783494	0.597393	2.985	0.002990 **
sales:recipe	0.748332	0.385111	1.943	0.052636 .
sales:holiday_post	0.374046	0.246129	1.520	0.129302
recipe:video	0.417615	0.208244	2.005	0.045533 *
recipe:useful_tips	0.642744	0.344821	1.864	0.062990 .
event_in_store:link	0.839084	0.361796	2.319	0.020841 *
for_fun:photo	2.242454	0.697772	3.214	0.001407 **
holiday_post:video	-0.721918	0.292369	-2.469	0.013921 *
useful_tips:video	1.299274	0.762243	1.705	0.088988 .
useful_tips:link	0.797606	0.724273	1.101	0.271391

Negative Binomial

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	6.470274	0.435999	14.840	< 2e-16 ***
post_len	-0.008342	0.003778	-2.208	0.027237 *
I(post_num^2)	0.050546	0.035149	1.438	0.150417
post_num	-0.264980	0.169095	-1.567	0.117105
brand_image	-0.396921	0.162963	-2.436	0.014865 *
product	-0.588630	0.185835	-3.167	0.001538 **
sales	0.277055	0.131303	2.110	0.034855 *
recipe	-0.676653	0.126512	-5.349	8.87e-08 ***
event_in_store	-0.840728	0.316882	-2.653	0.007975 **
for_fun	-0.336873	0.185784	-1.813	0.069793 .
online_activity	-0.017680	0.308321	-0.057	0.954271
holiday_post	0.093459	0.120982	0.772	0.439820
useful_tips	-0.922491	0.708623	-1.302	0.192982
video	0.305090	0.417670	0.730	0.465111
link	-0.091127	0.400306	-0.228	0.819923
event	0.024534	0.623001	0.039	0.968588
photo	-0.048418	0.420438	-0.115	0.908318
food_bar	2.314750	0.395452	5.853	4.82e-09 ***
Hiring	1.264390	0.453190	2.790	0.005271 **
year_2018	0.268020	0.119828	2.237	0.025305 *
brand_image:photo	0.668233	0.347041	1.926	0.054165 .
brand_image:event	2.023054	0.895437	2.259	0.023865 *
brand_image:product	0.442505	0.330713	1.338	0.180886
brand_image:online_activity	1.457546	0.478871	3.044	0.002337 **
product:link	0.686430	0.209496	3.277	0.001051 **
product:online_activity	1.316319	0.679185	1.938	0.052613 .
sales:event_in_store	1.738716	0.595535	2.920	0.003505 **
sales:recipe	1.068017	0.384013	2.781	0.005416 **
sales:holiday_post	0.615445	0.245498	2.507	0.012179 *
recipe:video	0.471682	0.207916	2.269	0.023291 *
recipe:useful_tips	1.172244	0.344117	3.407	0.000658 ***
event_in_store:link	0.803448	0.361557	2.222	0.026271 *
for_fun:photo	2.165040	0.696030	3.111	0.001867 **
holiday_post:video	-0.507043	0.291860	-1.737	0.082337 .
useful_tips:video	1.103197	0.761530	1.449	0.147433
useful_tips:link	0.460724	0.723708	0.637	0.524375

Sprouts Model Selection

OLS

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	5.391e+00	5.196e-01	10.374	< 2e-16 ***
post_len	4.584e-03	1.001e-02	0.458	0.64740
I(post_len^2)	4.322e-05	8.112e-05	0.533	0.59473
postnum	2.928e-01	4.439e-01	0.660	0.51018
I(postnum^2)	-1.032e-01	1.093e-01	-0.944	0.34606
brand_image	-1.423e-01	4.128e-01	-0.345	0.73070
product	6.569e-01	2.300e-01	2.857	0.00470 **
sales	7.780e-01	2.557e-01	3.042	0.00264 **
recipe	-9.584e-01	4.031e-01	-2.378	0.01829 *
event_in_store	-7.595e-01	5.339e-01	-1.423	0.15629
for_fun	7.881e-01	4.883e-01	1.614	0.10798
holiday_post	-1.953e-01	2.087e-01	-0.936	0.35026
useful_tip	1.523e-01	3.638e-01	0.419	0.67583
video	-3.564e-01	2.774e-01	-1.285	0.20017
link	-1.210e+00	3.107e-01	-3.895	0.00013 ***
event	-1.919e+00	1.176e+00	-1.631	0.10429
afternoon	8.436e-02	1.445e-01	0.584	0.55991
day_of_week_3	-4.680e-01	1.849e-01	-2.531	0.01207 *
mon_7	3.933e-01	2.286e-01	1.721	0.08670 .
sales:video	-8.103e-01	4.590e-01	-1.765	0.07893 .
recipe:video	1.421e+00	4.715e-01	3.014	0.00288 **
event_in_store:video	2.663e+00	6.103e-01	4.363	1.98e-05 ***
product:link	5.669e-01	3.626e-01	1.563	0.11945
recipe:link	1.548e+00	5.020e-01	3.083	0.00231 **

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.015 on 218 degrees of freedom
 Multiple R-squared: 0.3975, Adjusted R-squared: 0.334
 F-statistic: 6.254 on 23 and 218 DF, p-value: 2.646e-14

Negative Binomial

Coefficients:

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	6.224357	0.433911	14.345	< 2e-16 ***
post_len	0.012689	0.004275	2.968	0.002994 **
I(postnum^2)	-0.085717	0.095616	-0.896	0.370003
postnum	0.175568	0.387979	0.453	0.650895
brand_image	-0.427396	0.365438	-1.170	0.242185
product	0.464122	0.199556	2.326	0.020031 *
sales	0.673427	0.215355	3.127	0.001766 **
recipe	-1.303140	0.375005	-3.475	0.000511 ***
event_in_store	-1.163679	0.475840	-2.446	0.014464 *
for_fun	0.508537	0.416738	1.220	0.222359
online_activity	-0.636275	0.254284	-2.502	0.012342 *
holiday_post	-0.142027	0.183931	-0.772	0.440011
video	-0.402844	0.244759	-1.646	0.099788 .
link	-1.330070	0.280735	-4.738	2.16e-06 ***
event	-2.270511	1.043594	-2.176	0.029580 *
night	-0.311206	0.136490	-2.280	0.022604 *
day_of_week_3	-0.581210	0.161863	-3.591	0.000330 ***
mon_7	0.380336	0.202325	1.880	0.060132 .
product:link	0.516886	0.321402	1.608	0.107786
recipe:link	1.952521	0.461239	4.233	2.30e-05 ***
recipe:video	1.568653	0.417554	3.757	0.000172 ***
event_in_store:video	2.703918	0.537982	5.026	5.01e-07 ***
sales:video	-0.480703	0.409112	-1.175	0.239998

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

(Dispersion parameter for Negative Binomial(1.2676) family taken to be 1)

Null deviance: 417.17 on 241 degrees of freedom
 Residual deviance: 271.75 on 219 degrees of freedom
 AIC: 3574.7

Final single post model (Sprouts with Robust SE)

Wholefoods_NB

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	6.470274	0.435999	14.840	< 2e-16 ***
post_len	-0.008342	0.003778	-2.208	0.027237 *
I(post_num^2)	0.050546	0.035149	1.438	0.150417
post_num	-0.264980	0.169095	-1.567	0.117105
brand_image	-0.396921	0.162963	-2.436	0.014865 *
product	-0.588630	0.185835	-3.167	0.001538 **
sales	0.277055	0.131303	2.110	0.034855 *
recipe	-0.676653	0.126512	-5.349	8.87e-08 ***
event_in_store	-0.840728	0.316882	-2.653	0.007975 **
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online_activity	-0.017680	0.308321	-0.057	0.954271
holiday_post	0.093459	0.120982	0.772	0.439820
useful_tips	-0.922491	0.708623	-1.302	0.192982
video	0.305090	0.417670	0.730	0.465111
link	-0.091127	0.400306	-0.228	0.819923
event	0.024534	0.623001	0.039	0.968588
photo	-0.048418	0.420438	-0.115	0.908318
food_bar	2.314750	0.395452	5.853	4.82e-09 ***
Hiring	1.264390	0.453190	2.790	0.005271 **
year_2018	0.268020	0.119828	2.237	0.025305 *
brand_image:photo	0.668233	0.347041	1.926	0.054165 .
brand_image:event	2.023054	0.895437	2.259	0.023865 *
brand_image:product	0.442505	0.330713	1.338	0.180886
brand_image:online_activity	1.457546	0.478871	3.044	0.002337 **
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product:online_activity	1.316319	0.679185	1.938	0.052613 .
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sales:recipe	1.068017	0.384013	2.781	0.005416 **
sales:holiday_post	0.615445	0.245498	2.507	0.012179 *
recipe:video	0.471682	0.207916	2.269	0.023291 *
recipe:useful_tips	1.172244	0.344117	3.407	0.000658 ***
event_in_store:link	0.803448	0.361557	2.222	0.026271 *
for_fun:photo	2.165040	0.696030	3.111	0.001867 **
holiday_post:video	-0.507043	0.291860	-1.737	0.082337 .
useful_tips:video	1.103197	0.761530	1.449	0.147433
useful_tips:link	0.460724	0.723708	0.637	0.524375

Sprouts_NB

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	6.2243575	0.5391916	11.5439	< 2.2e-16 ***
post_len	0.0126890	0.0041139	3.0844	0.0020397 **
I(postnum^2)	-0.0857165	0.1056651	-0.8112	0.4172454
postnum	0.1755681	0.4604027	0.3813	0.7029539
brand_image	-0.4273956	0.4066595	-1.0510	0.2932626
product	0.4641222	0.2445723	1.8977	0.0577370 .
sales	0.6734270	0.2489726	2.7048	0.0068341 **
recipe	-1.3031404	0.5160002	-2.5255	0.0115545 *
event_in_store	-1.1636789	0.4099906	-2.8383	0.0045354 **
for_fun	0.5085367	0.2298766	2.2122	0.0269517 *
online_activity	-0.6362753	0.2366600	-2.6886	0.0071760 **
holiday_post	-0.1420272	0.3528075	-0.4026	0.6872699
video	-0.4028442	0.2677871	-1.5043	0.1324925
link	-1.3300700	0.3247379	-4.0958	4.207e-05 ***
event	-2.2705110	0.4646251	-4.8868	1.025e-06 ***
night	-0.3112058	0.1305319	-2.3841	0.0171193 *
day_of_week_3	-0.5812095	0.1541888	-3.7695	0.0001636 ***
mon_7	0.3803362	0.2455522	1.5489	0.1214053
product:link	0.5168862	0.3638883	1.4205	0.1554759
recipe:link	1.9525210	0.6267870	3.1151	0.0018387 **
recipe:video	1.5686531	0.5636141	2.7832	0.0053825 **
event_in_store:video	2.7039182	0.4619014	5.8539	4.802e-09 ***
sales:video	-0.4807034	0.5903443	-0.8143	0.4154866

Single Post Model Findings

**What contents * types combinations can create
more engagement?**

Wholefoods: seasonal product * link, product meets people's interest

Whole Foods Market
March 10, 2017 ·

Sweet as π .

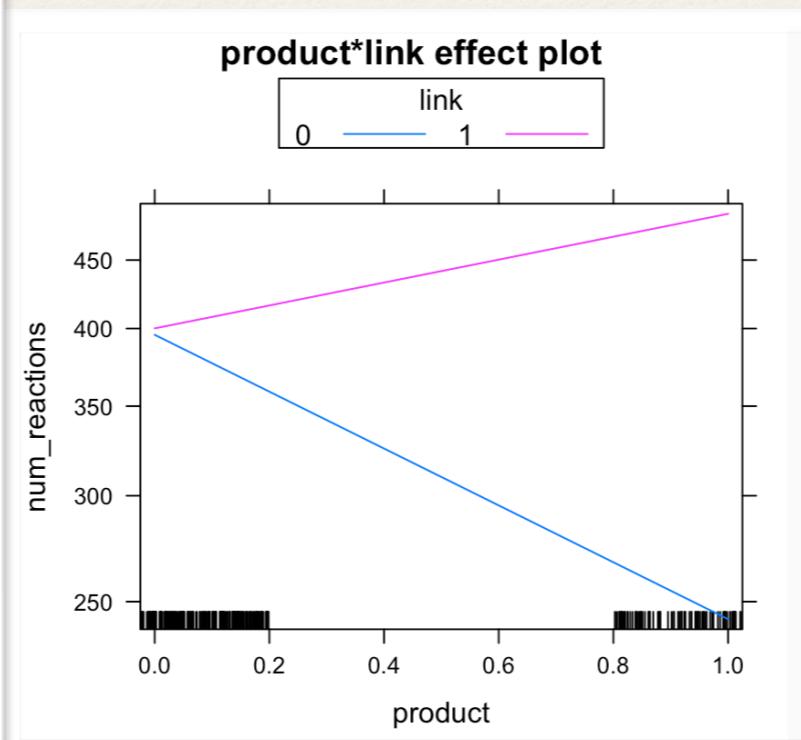


Whole Foods Is Offering Some SWEET Pi Day Deals
On Tuesday, March 14, or 3.14, Whole Foods is offering Pi Day deals...
WWW.REFINERY29.COM

Like Comment Share

2.1K

Top Comments ▾



Whole Foods Market with Love and Lemons.
July 9, 2017 · Paid ·

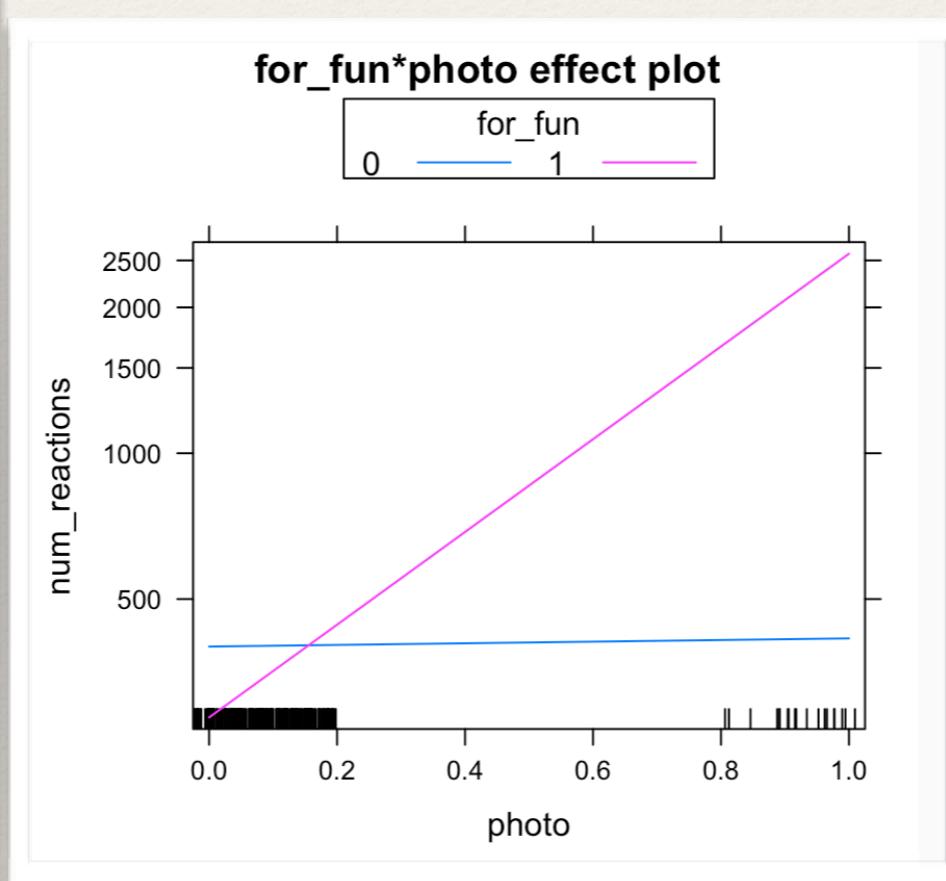
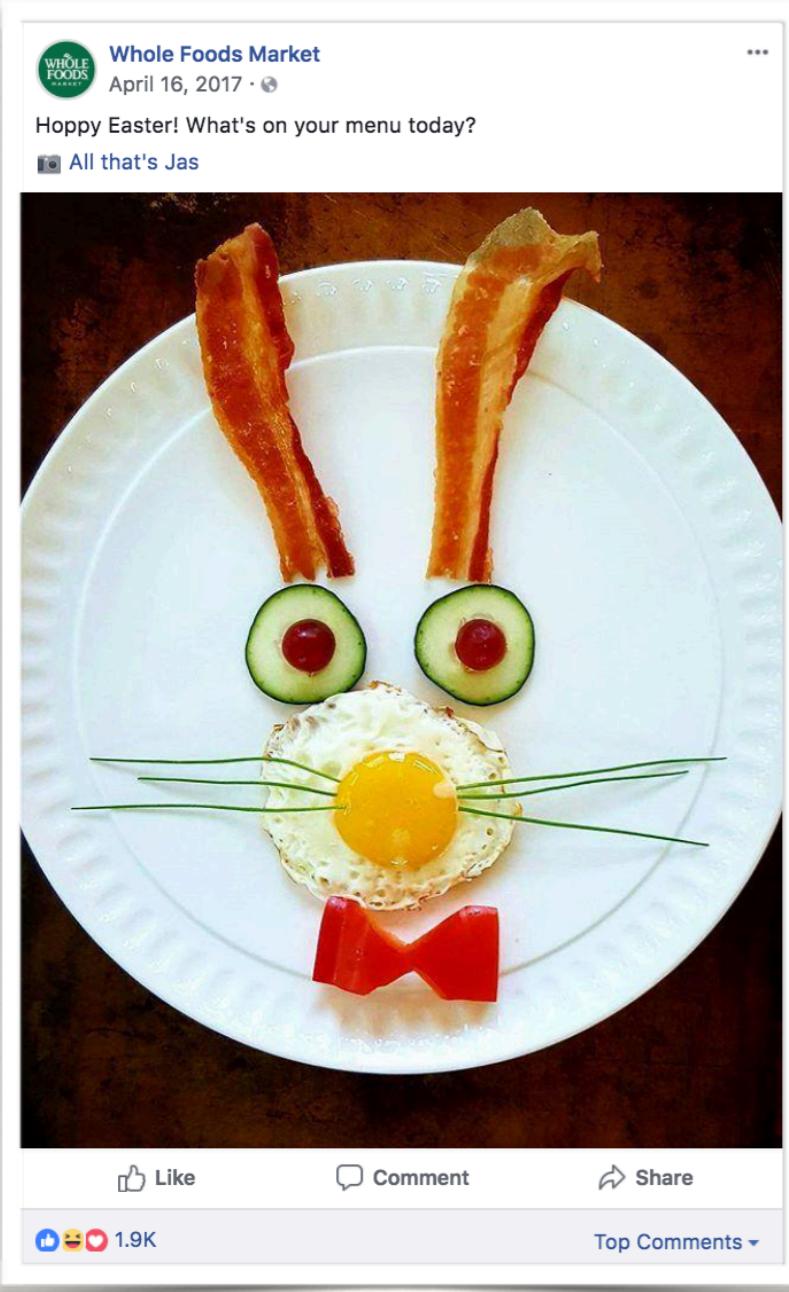
The perfect summer smoothies to get you through the week ahead.



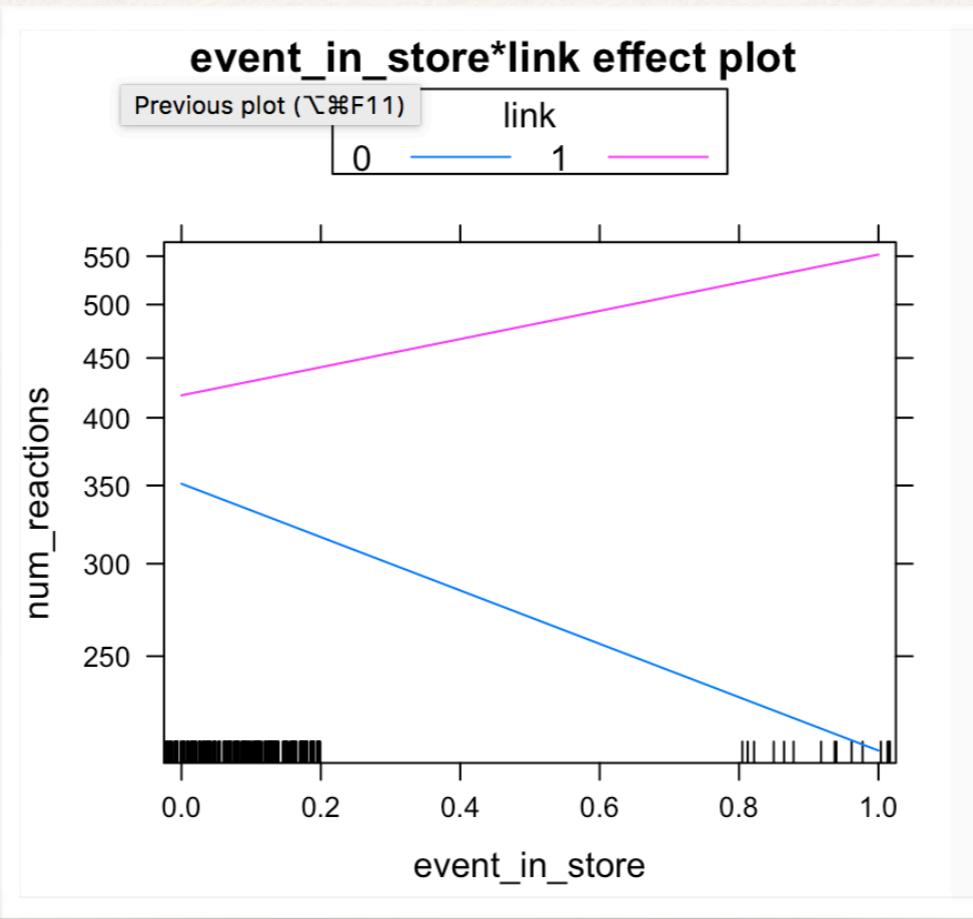
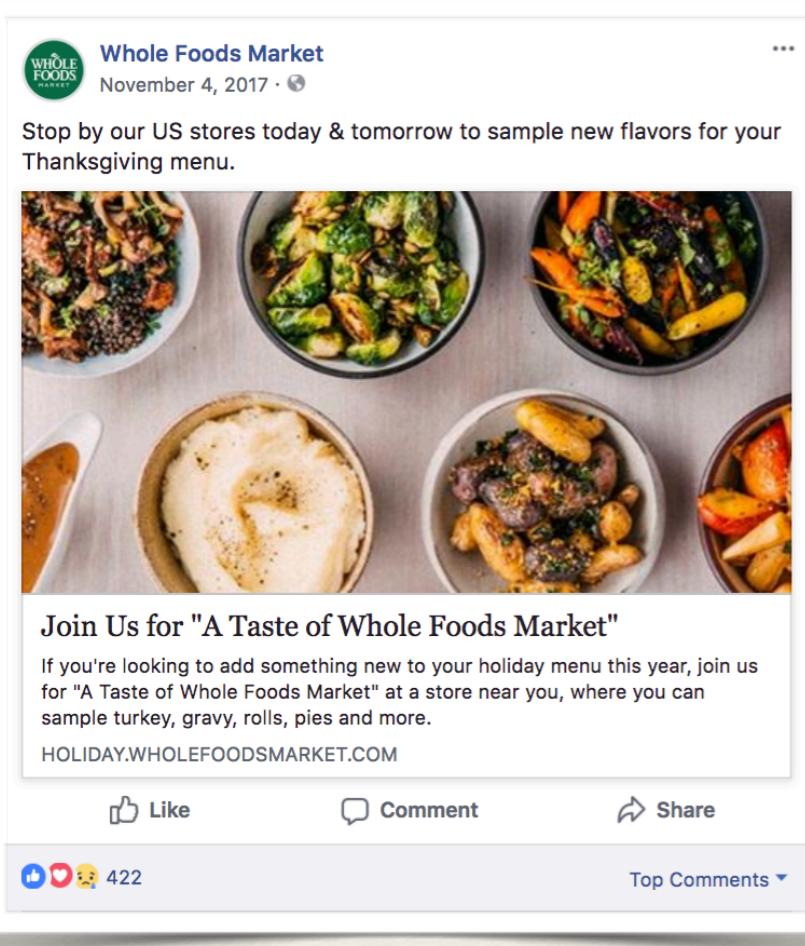
4 Summer Smoothies Inspired by Classics Combos from Love & Lemons
Celebrate summer with these recipes for smoothies based on classic combos like PB&J from the duo behind the award-winning blog Love & Lemons.
WHOLEFOODSMARKET.COM

Like Comment Share

Wholefoods Funny photo works



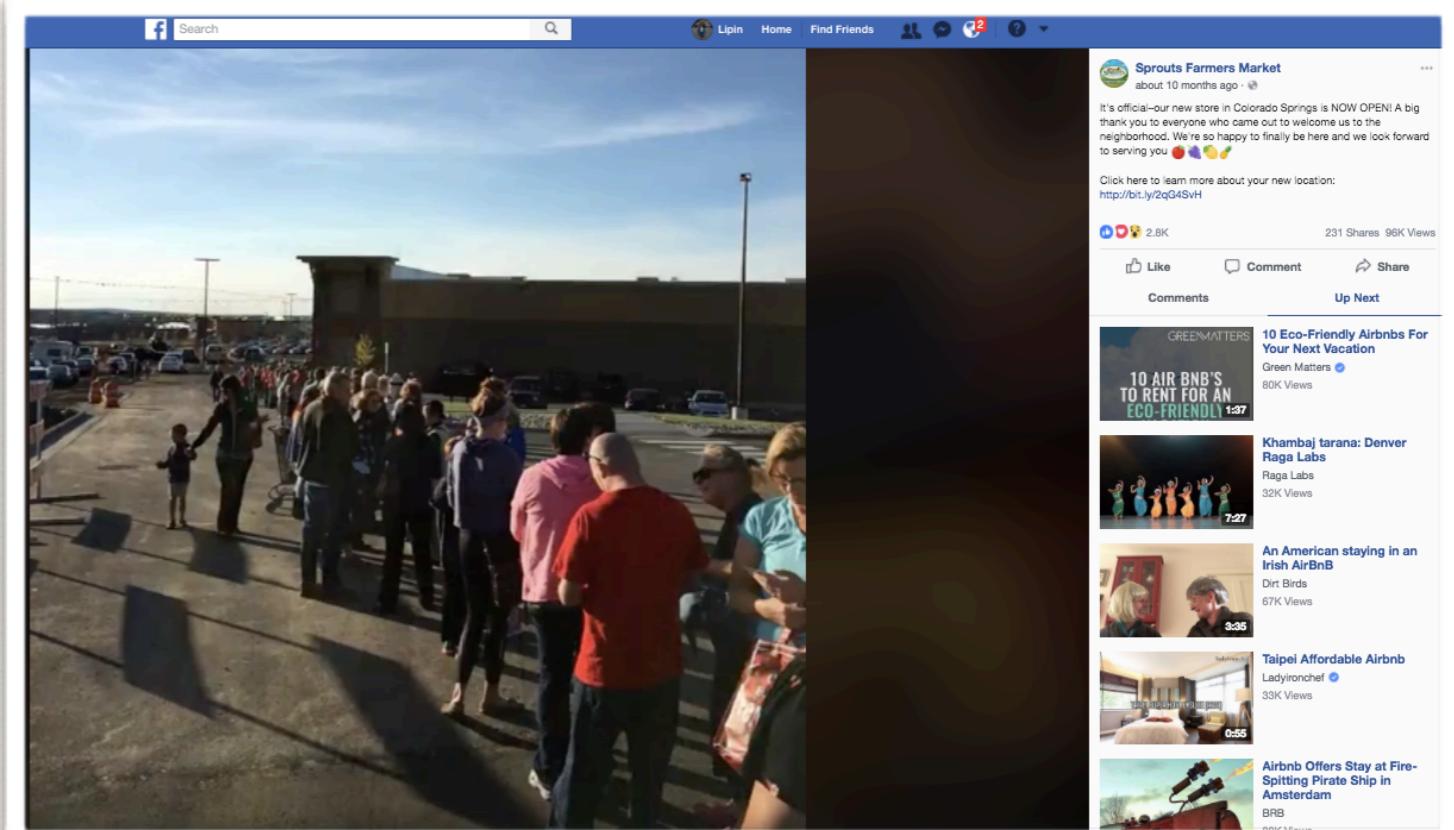
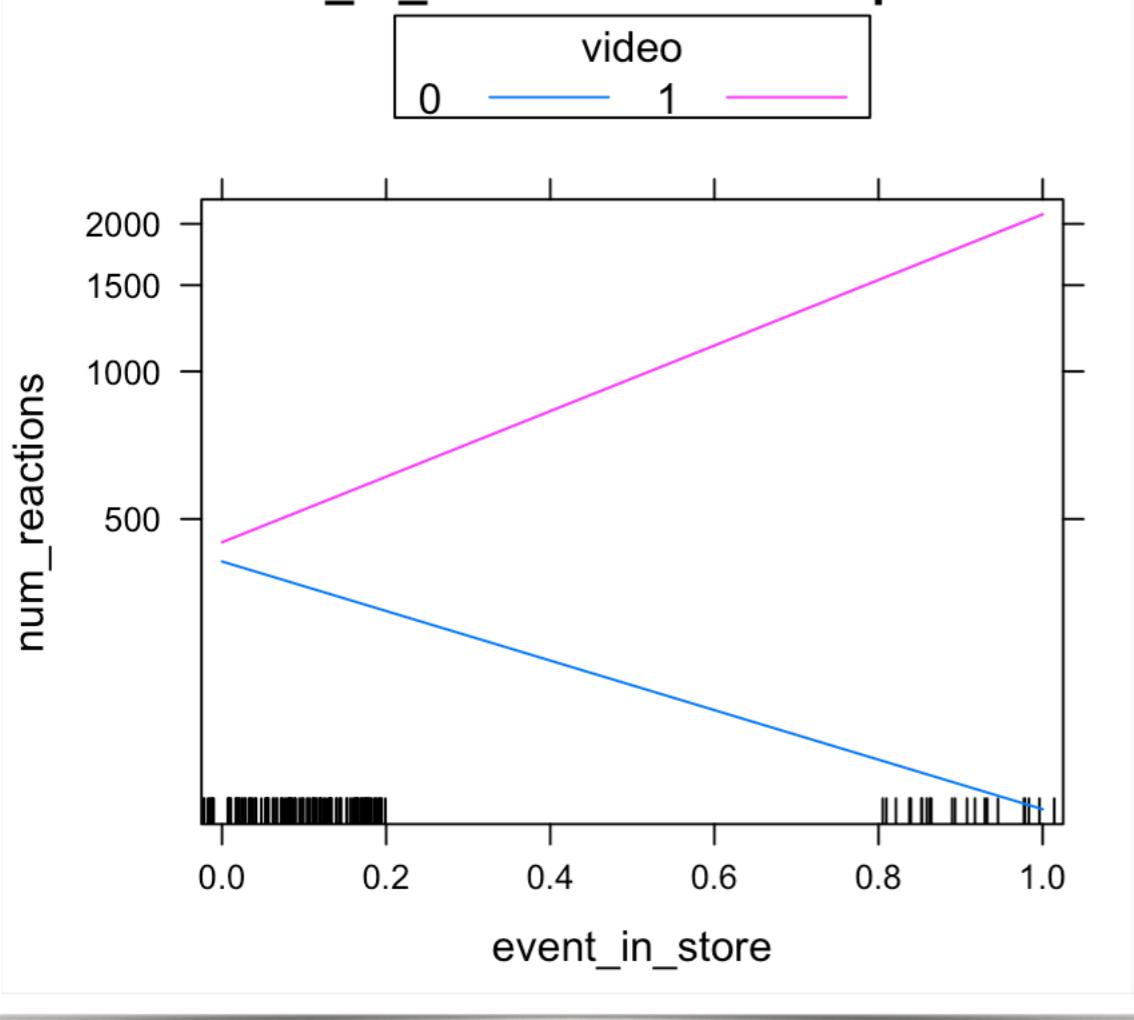
Wholefoods: offline event *link, event matters.



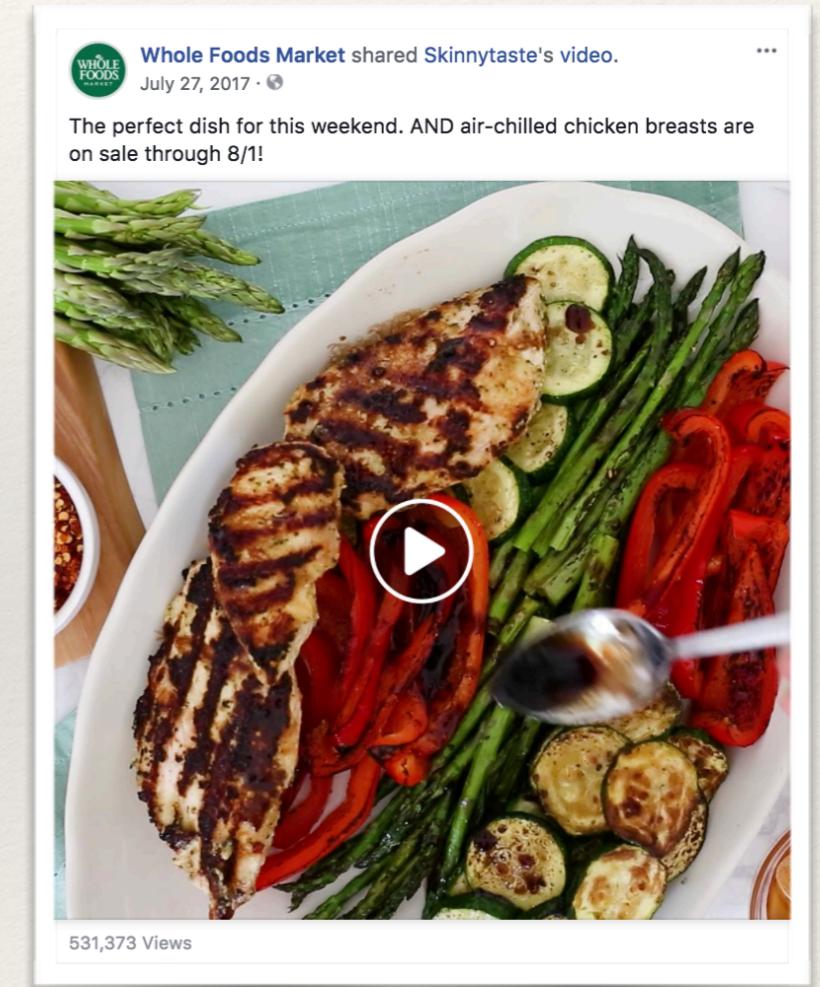
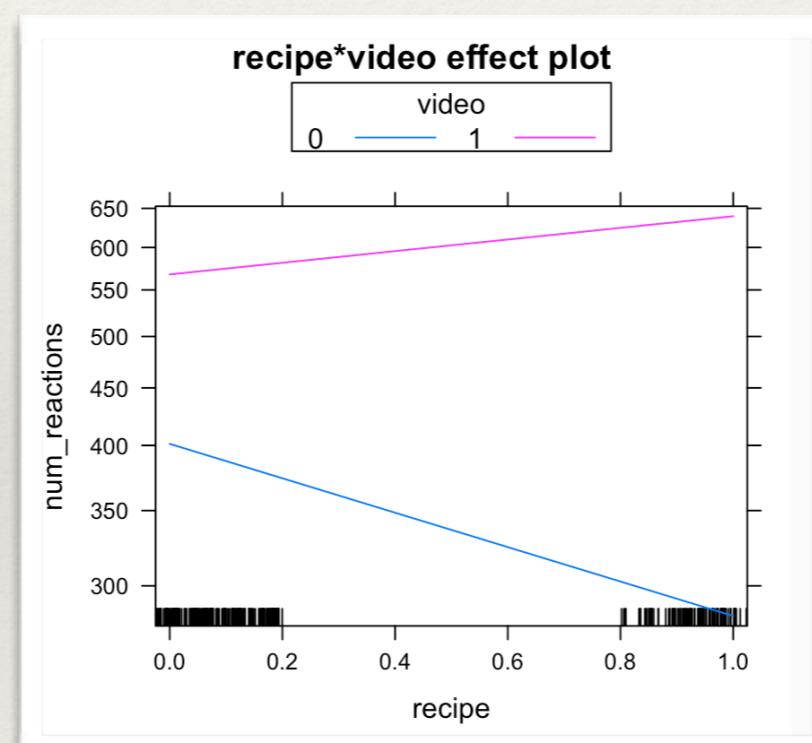
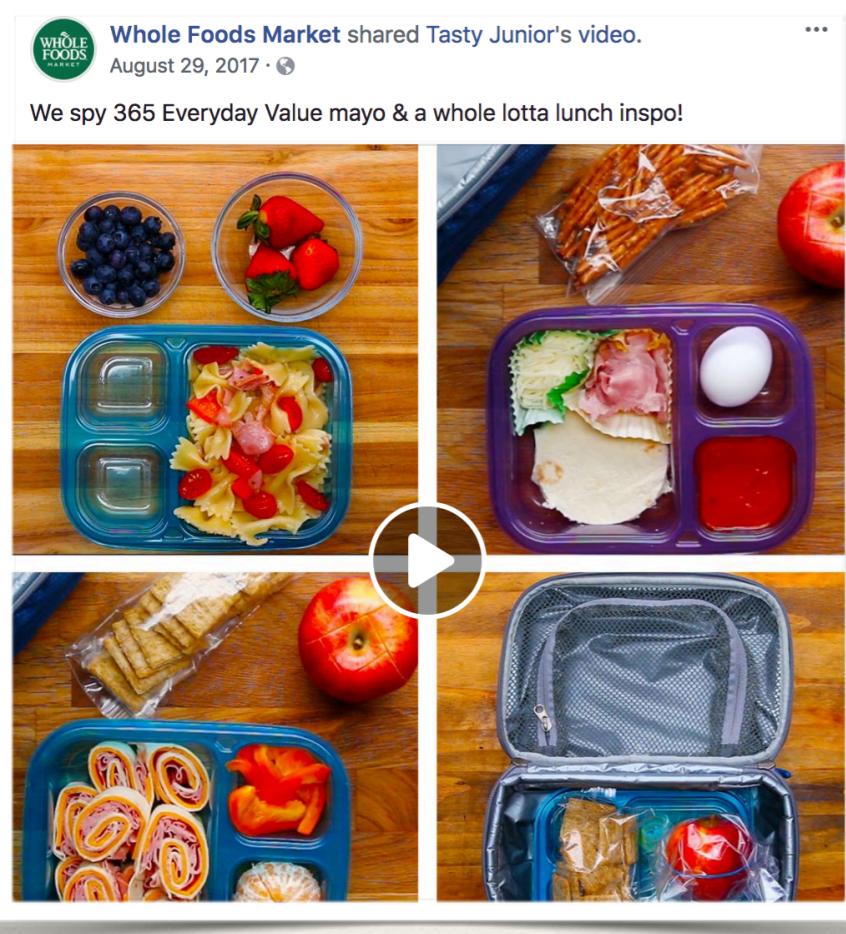
Event in store * video

Sprouts benefited from, wholefoods didn't use.

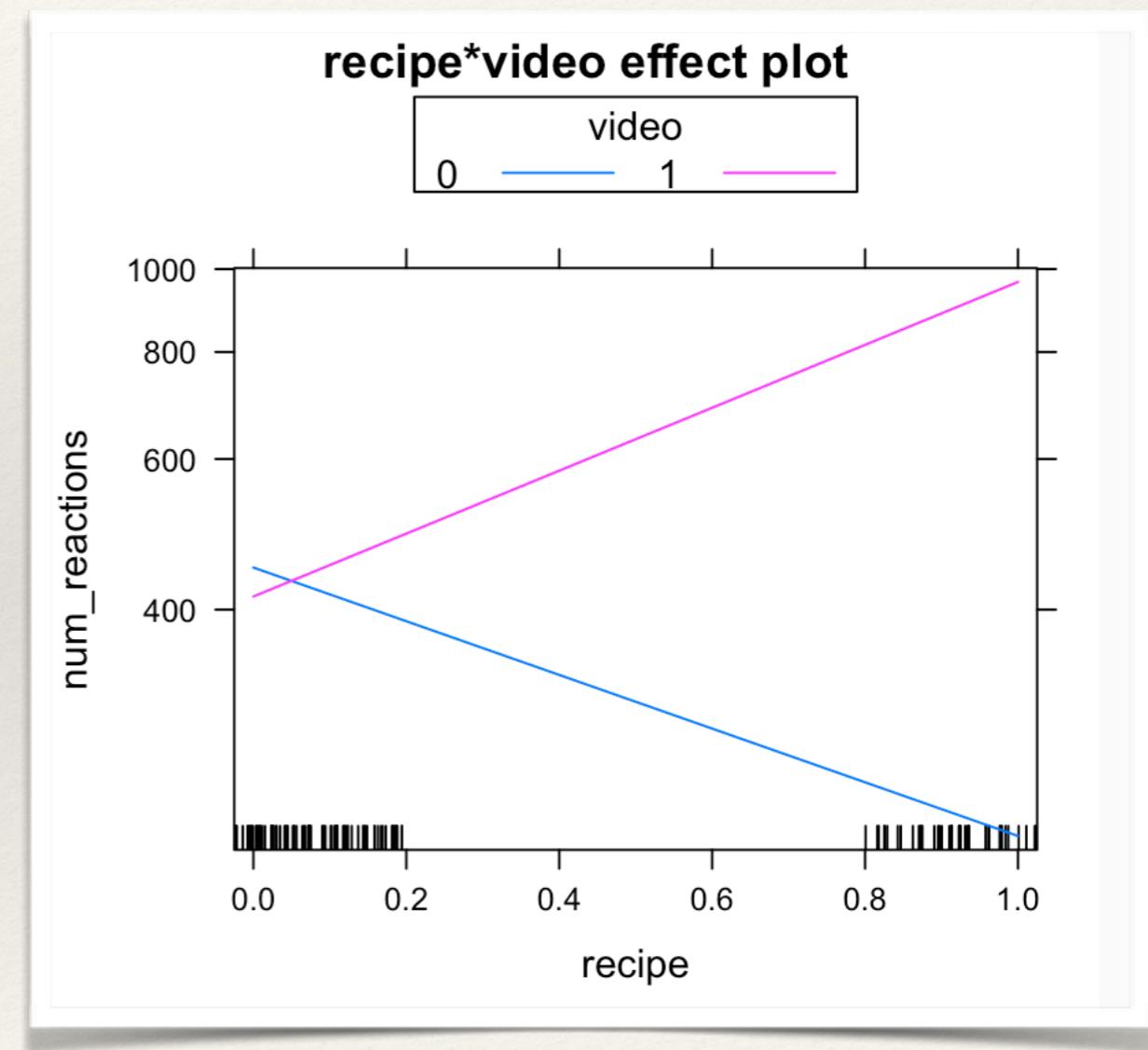
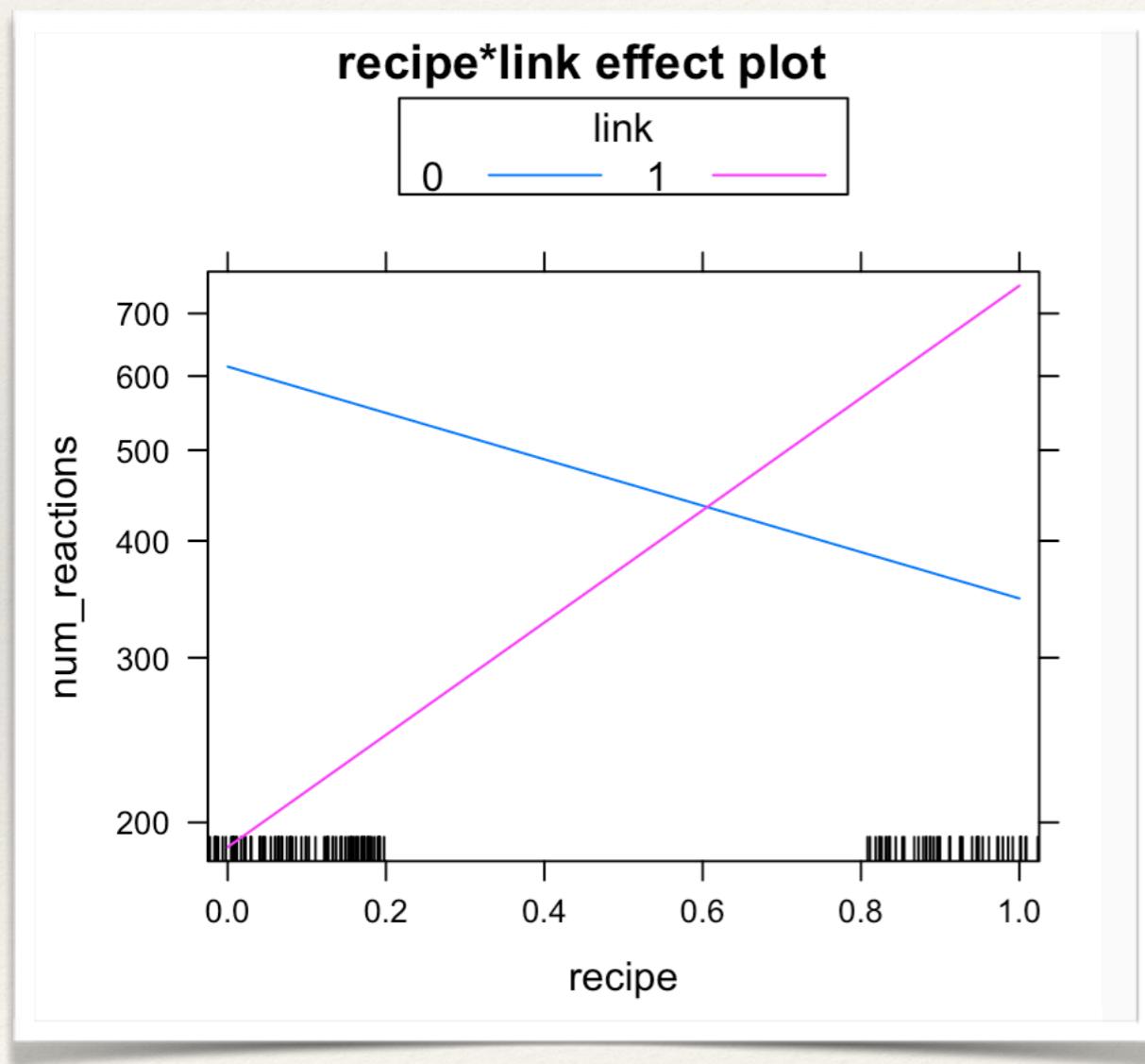
event_in_store*video effect plot



Wholefoods: Recipe*video, show them how to cook



Sprouts : Recipe * Video, Recipe * Link



Why wholefoods didn't get benefit?

 Whole Foods Market with The Defined Dish.
September 2, 2017 · Paid · 

Labor Day Weekend = Kabobs!



Spiced Beef Kabobs with Mint Yogurt Sauce – The Defined Dish

Labor Day weekend is almost here, and it's time to fire up your grills and celebrate with the ones you love most! We are driving to Arkansas to spend a...

THEDEFINEDDISH.COM

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161

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CONTACT



sauce



Welcome! I'm Alex, a food lover sharing healthy, simple, delicious, recipes from my kitchen to yours. Here you'll find lots of Whole30, lots of healthy, and a little indulgence here and there because... It's all about balance y'all!

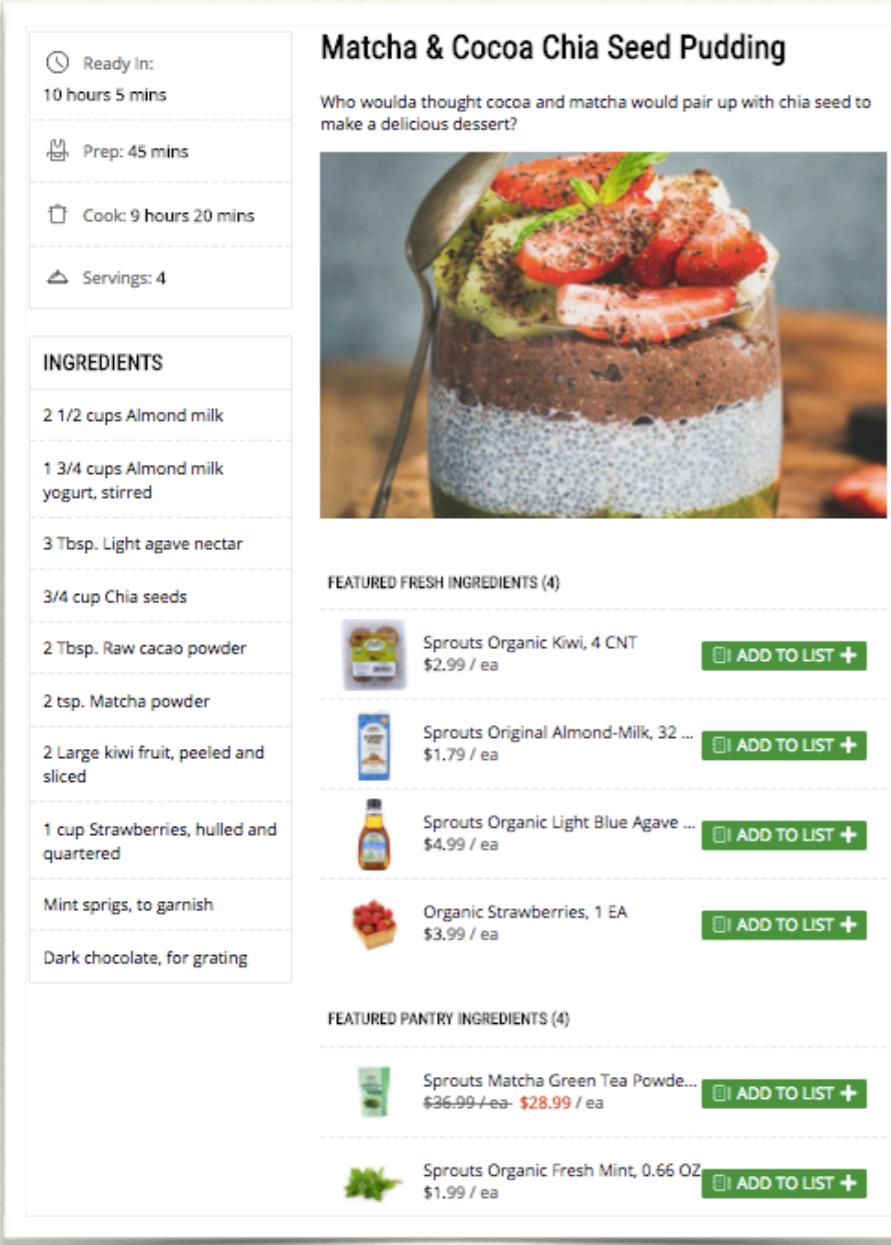
GET TO ALEX >

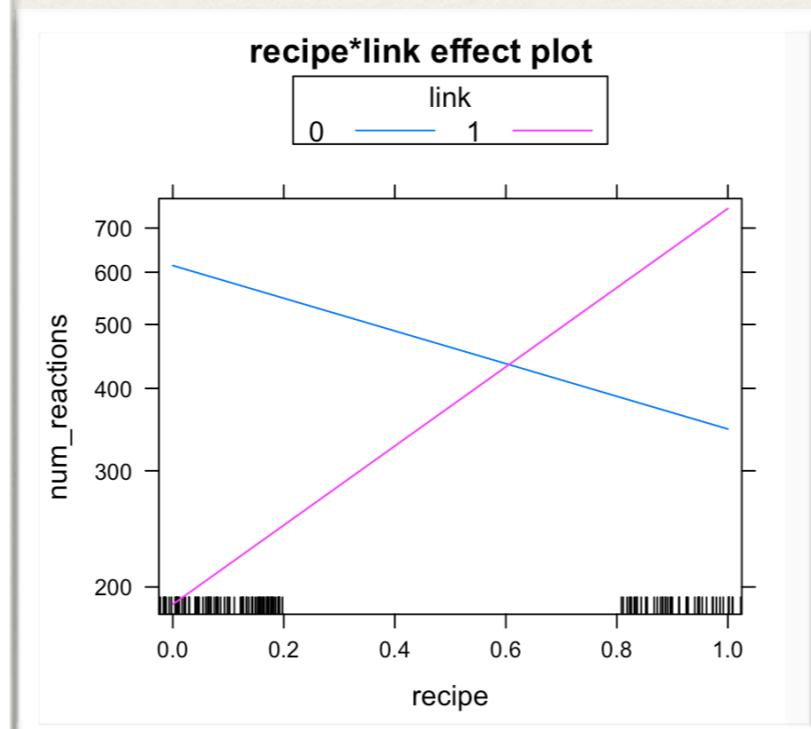


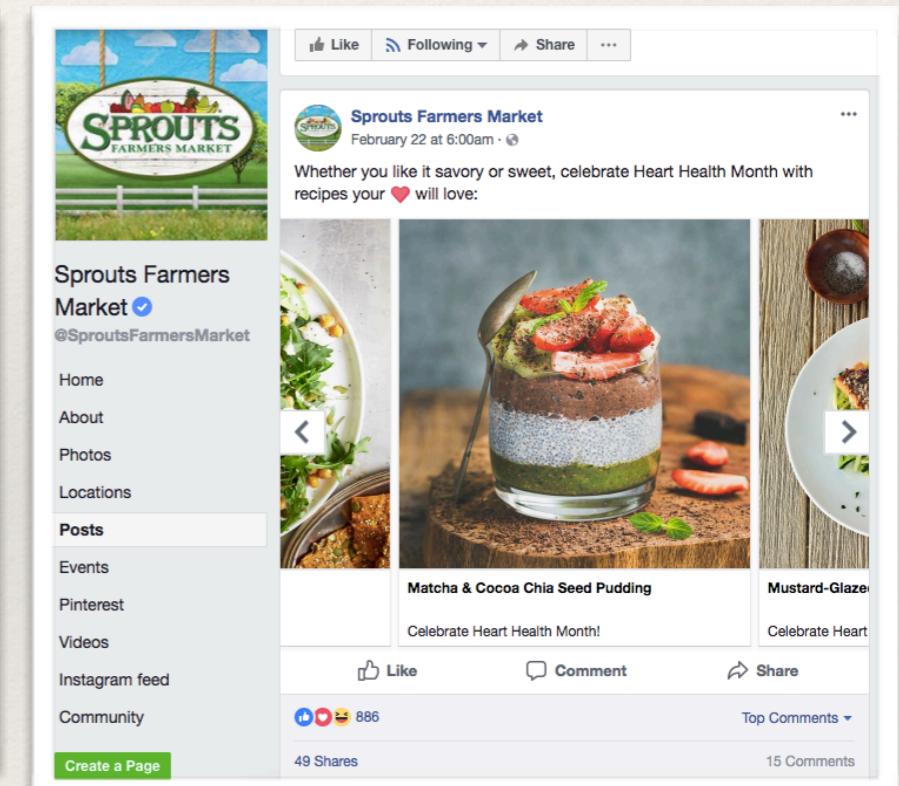
TRENDING NOW



Sprouts Recipe*Link readable, actionable

A detailed recipe card for Matcha & Cocoa Chia Seed Pudding. It includes sections for ingredients, preparation time, cooking time, and servings. The ingredients list includes almond milk, chia seeds, cacao powder, matcha powder, kiwi, agave nectar, strawberries, and mint. The preparation time is 10 hours 5 mins, prep is 45 mins, cook is 9 hours 20 mins, and serves 4. The featured fresh ingredients are Sprouts Organic Kiwi, Sprouts Original Almond-Milk, Sprouts Organic Light Blue Agave Nectar, and Organic Strawberries. The featured pantry ingredients are Sprouts Matcha Green Tea Powder and Sprouts Organic Fresh Mint.



A screenshot of a Facebook post from Sprouts Farmers Market. The post features a photo of the Matcha & Cocoa Chia Seed Pudding. The caption reads: "Whether you like it savory or sweet, celebrate Heart Health Month with recipes your ❤️ will love!" The post has 49 shares and 15 comments. The sidebar shows the page's navigation menu with 'Posts' selected.

Limitations

- ❖ Limited data
- ❖ Individual level data analysis
- ❖ More detailed post types
- ❖ Recommendations based on future post contents consist with previous posts

Recommendations for Wholefoods



- 01** *More Videos!*
- 02** *More photo
but don't exceed 20/week*
- 03** *Making recipe links readable*
- 04** *Posts with Familiar things*
- 05** *Promote in Video Type*

Next move...



Provide company marketing strategy recommendations based on social media analysis



- ❖ Brand Recognition
- ❖ Financial Insight
- ❖ Cost - Budget Analysis



- ❖ Provide Detailed Customer Insights
- ❖ Interpret reasonable conversion rates



- ❖ Define Engagement Score Measurement
- ❖ Get the Tech guy from LinkedIn
- ❖ Individual level data???
- ❖ Try to Corporate with business company