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Social Networks Shape Beliefs and Behavior
Online Appendix

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A.1 Additional Results

A.1.1 Effects of Friend Exposure on Social Distancing Behavior: Magnitude

In this section, we compare the magnitudes of the effects of friend exposure on social distancing in the early pandemic with the effects of demographic characteristics on social distancing. Our analysis is based on the following multivariate specification:

$$\Delta Y_i = \alpha_1 \log(FriendExposure_i^{Mar15}) + \alpha_2 X_i + \epsilon_i. \tag{A.1}$$

ΔY_i is individual i's change in average probability of staying home between February 2020 (before pandemic) and April 2020 (during the height of the first U.S. pandemic wave). $FriendExposure_i^{Mar15}$ is defined as in equation 1 in the main paper. X_i is a vector consisting of dummies for age, gender, educational attainment, ownership of iPhone and tablet, and tertiles of ZCTA-level income and local exposure to Covid-19 (county-level Covid-19 cases per resident as of March 15). Depending on the specifications, we include additional controls in X_i.

Table A.8 presents the results, while Appendix Table A.23 shows corresponding results using the percentage change in tiles visited as the dependent variable. Columns 1 and 2 of Table A.8 show that older users, female users, and users who reported a college increase their probabilities of staying home more than others. Columns 3-5 add controls for friend exposure to Covid-19 cases, as well as fixed effects for friend-weighted network characteristics as described in the discussion of equation 3. Column 3 includes ZCTA fixed effects but omits all other individual-level characteristics of columns 1 and 2. Given a standard deviation in $\log(FriendExposure_i^{Mar15})$ of 1.35, the coefficient estimate on friend exposure of 0.92 indicates that a one standard deviation increase in friend exposure is associated with an increase in the probability of staying at home of about 1.2 percentage points, an 8.8% increase relative to the sample mean of 13.7%. Adding additional individual-level characteristics to the regression in column 4 decreases the coefficient estimate for α_1 only slightly to 0.85.

Comparing the coefficient estimates for friend exposure to Covid-19 to those for other individual-level characteristics highlights that friend exposure is an important determinant of social distanc-

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ing. An increase in friend exposure by one standard deviation corresponds to an increase in social distancing that is more than two-thirds as large as being age 55 or older, and hence belonging to a group that is considered most vulnerable to the health risks of Covid-19. In column 5 of Table A.8, we include the full interaction of individual-level controls with ZCTA fixed effects. This has no additional impact on the estimated coefficient estimate for α_1.[1] Columns 6-8 show that α_1 remains relatively stable when focusing on weekend/weekday movement and when controlling for particular college fixed effects.

A.1.2 Friendship Links to Other Countries

In our baseline specifications, we focused on exposure to Covid-19 cases among individuals' U.S.-based social networks. But many of the early Covid-19 hotspots around the world were outside of the United States. To test whether friend exposure to these foreign hotspots also affected social distancing behavior, Appendix Table A.9 adds controls for the fraction of friends living in China, South Korea, Italy, and Spain, all of which were early hotspots of the Covid-19 pandemic. Interestingly, just like exposure to early U.S.-based Covid-19 hotspots was associated with a larger propensity to reduce mobility, stronger friendship links with foreign countries with early Covid-19 outbreaks were similarly associated with an increased propensity to stay at home.

[1] Our sample size is about 5% smaller in this regression, due to combinations of ZCTA- and individual-level characteristics for which we have only a single observation. In Appendix Figure A.12, we present a binned scatter plot corresponding to this specification. Appendix Figure A.13 presents the corresponding binned scatter plot for the percentage change in average tiles visited. These figures confirm the linear relationship between the change in mobility and the log of friend exposure.

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A.2 Public Data Analyses and Results

In this Appendix, we reproduce some of our key results using aggregated information on social networks and movement patterns.

A.2.1 Safegraph Data

In light of the Covid-19 pandemic, Safegraph Inc. released several data products to researchers that allow for a detailed understanding of consumer spending and of mobility patterns across time and space. We use social distancing data and point of interest (POI) visit data from Safegraph, both of which were widely used by contemporaneous research on the Covid-19 pandemic.

The Safegraph Social Distancing data contains location data obtained from a number of smartphone applications. Safegraph uses each user's location history to impute their Census block group of residence, and provides aggregated data for each block group from January 1, 2020. We use data through July 28, 2020 to construct the number of devices that are assigned to a Census block group on a given day, the number of devices that do not leave their home location during a given day,[2] and the average distance traveled.[3] The average number of devices observed on a given day in our sample period is about 19 million. Using these metrics, we calculate (a) the fraction of devices that remain at home over the course of a day and (b) the average distance traveled in kilometers. These two ZCTA-level measures of social distancing correspond roughly to the Facebook measures of the probability of staying at home and average daily tile movement, respectively. As before, we construct weekly averages.

Safegraph's POI data aggregates cellphone GPS pings to measure the number of visits by residents of an area to particular establishments. We use these data through July 28, 2020 to construct a weekly measure of the total POI visits by ZCTA, both overall and by industry.[4] With the objective of distinguishing between 'essential' and 'nonessential' places, we focus on the following categories: (i) Arts, Entertainment, and Recreation (NAICS code 71), (ii) Food Services and Drinking Places (NAICS code 722), (iii) Retail Trade Excl. Food and Beverage Stores (NAICS codes 44 and 45, excluding 445), (iv) Food and Beverage Stores (NAICS code 445), (v) Parks (NAICS code 712190); and (vi) Health Care and Social Assistance (NAICS code: 62). We think of (i)-(iii) as less essential places that can be avoided in order to reduce physical interaction. By contrast, (iv)-(vi) are either more essential or entail very limited physical interaction.

[2] Home location corresponds to the geohash-7 in which home is located. A geohash-7 is a region about 500 feet on each side.

[3] We construct the average distance traveled based on the number of devices per bin of travel distance. Where possible, we use the mean of highest and lowest value of the bin. For the open-ended top bin ($>$ 50km) we assign a value of 75km.

[4] For the sample period, there are on average 27.5 million POI visits each day, distributed over roughly 5.4 million POIs.

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A.2.2 ZCTA-Level Friend Exposure to Covid-19

To construct a measure of friend exposure to Covid-19, we combine data from Facebook on social connectedness and data from the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. The Social Connectedness Index (SCI) (Bailey et al., 2018) is a scaled metric of relative connectedness of different ZCTAs across the U.S., defined as:

$$SCI_{ij} \propto \frac{FBConnections_{ij}}{FBUsers_i \times FBUsers_j}. \tag{A.2}$$

$FBConnections_{ij}$ is the scaled number of connections between ZCTA i and ZCTA j, and $FBUsers_i$ and $FBUsers_j$ are the respective numbers of users for ZCTA i and j. To create our measure of friend exposure, we begin by calculating per-user connections between ZCTA i and county k:

$$PerUserConnect_{ik} = \sum_{j \in k} SCI_{ij} * Pop_j \tag{A.3}$$

Pop_j is the population of ZCTA j that is in county k. Note that in the absence of public data on user counts, we use population counts rather than user counts. In constructing this measure we have two objectives. First, since the data on Covid-19 cases is only available at the county level this measure moves us from zips to counties. Second, this measure of per-user connections helps to construct a measure of friend exposure that is independent of the number of users or friends on Facebook (which might systematically differ with the way Facebook is used across regions). Next, for each ZCTA i, we calculate the fraction of per-user connections from county k relative to all counties:

$$FracConnect_{ik} = \frac{PerUserConnect_{ik}}{\sum_{k \in K} PerUserConnect_{ik}} \tag{A.4}$$

We can loosely think of this measure as the fraction of all friends a representative user in ZCTA i has in county k. As a final step, we multiply this metric with the number of Covid-19 cases in county k and sum over all counties in order to create our measure of friend exposure to Covid-19. Since the number of cases varies over time, this metric is also time-variant (in our case, by week).

$$FriendExpCOVID_{it} = \sum_{k \in K} FracConnect_{ik} \times Cases_{kt} \tag{A.5}$$

A.2.3 Replication at ZCTA Level

To validate the findings presented in Section 2, we estimate the effect of having high social exposure to Covid-19 cases at the zip level on social distancing behavior at the zip level:

$$Y_{it} = \mu_i + \sum_{t=1}^{29} \beta_t \left(HighExp_i \times week_t \right) + \sum_{t=1}^{29} \delta_t' \left(X_i \times week_t \right) + \epsilon_{it} \tag{A.6}$$

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Y_{it} is our measure of social distancing for ZCTA i during week t constructed from Safegraph data, i.e. either (a) the average fraction of devices at home full-time for a given ZCTA or (b) the percentage change in the average distance traveled relative to January 2020.[5] The variable μ_i represents ZCTA fixed effects. $HighExp_i$ is an indicator equal to one if ZCTA i has friend exposure to Covid-19 higher than the median for the county it is located in, based on the number of Covid-19 cases as of March 15. As before, $week_t$ is an indicator for the week of the outcome. Here we include data for the week of January 1st as $t = 0$, but omit a coefficient for this reference time period. We include a rich set of controls: in addition to county-time fixed effects, we control for various zip-level covariates interacted with time fixed effects. These are the median household income of the area, as well as the fraction of individuals in in each of the following demographic groups: male, Asian, black, white, service employee, manager, art or science employee, high-speed internet user, high-school educated, some college completion, college educated. We also control for the fraction of individuals in several age buckets: between 18 and 24, between 25-34, between 35-44, between 45-54, between 55-64, between 65-74 and above 75. All these control variables are obtained from the most recent 5-year ACS (2014-2018). Finally, as described in depth in Section 2, we control for national ventiles of friend exposure to other factors, i.e. median household income, population density and urbanity.[6] In Table A.24, we show the differences between high and low friend-exposure places with respect to these characteristics.

While high and low friend-exposure places appear balanced on many demographic characteristics, a few differences are noticeable. In particular, high-exposure places are slightly more racially diverse, have a somewhat lower median household income, and include individuals more likely to have a college degree. High-exposure places also have larger populations, are more densely populated, and have more POIs. While none of these differences is very large, they might affect the average ability or willingness of residents to engage in social distancing in a way that is independent of friend exposure. We therefore control for all the above-mentioned set of covariates and allow for the value of these controls to vary over time. Together, these control variables help to alleviate concerns that any observed effects are merely driven by differences in demographic, socioeconomic or other work-related variables that are correlated with social distancing behavior. Figure A.14 depicts the corresponding β_t estimates from Equation A.6. These coefficients capture the effect of having a level of (ZCTA-level) friend exposure to Covid-19 that is above the county mean. Standard errors are clustered at the ZCTA-level.

Figure A.14 shows changes in mobility as a result of friend exposure to Covid-19 that are qualitatively very consistent with the results presented in Section 2. As is in apparent both in Figure A.14a and in Figure A.14b, in January and February—before the outbreak of the pandemic in the U.S.—changes in mobility between high and low-exposure places are always very close to zero.

[5] More precisely, based on our measure of average distance traveled for ZCTA i during week t, i.e. $AvgDist_{it}$, we calculate $\%\Delta Dist_{it} = \frac{AvgDist_{it} - AvgDist_{iJan20}}{AvgDist_{iJan20}} * 100$.

[6] These friend-exposure variables are constructed as $FriendExpMetric_i = \sum_{k \in K} FracConnect_{ik} \times Metric_k$ where $Metric_k$ is one of population density, median household income (both from ACS 2014-2018) and the fraction of the population residing in urban settings (from 2010 Census).

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Beginning in the week of March 4, these coefficients begin to shift, indicating that groups with more friend exposure have begun to stay home more and travel less. For the fraction of devices at home, coefficients continue to rise, reaching levels of around 0.025 in late March and early April. Thereafter, coefficients slowly return to values closer to zero, yet they remain statistically significant for several more weeks, until the middle of May. In line with these patterns, for the percentage change in the average distance traveled, coefficients continue to fall during late March and stay low, i.e. around -1.5, for much of April before they gradually return to around zero. Together, these estimates highlight that as the Covid-19 pandemic hits the U.S., places with greater friend exposure to Covid-19 reduce their mobility more than places with lower friend exposure. These effects are persistent over time and cannot entirely be explained by our measures of differential ability or willingness to engage in social distancing. Despite the different data source, the different level of analysis and the different sample, these results are thus consistent with the evidence presented in Section 2: friend exposure to Covid-19 matters when trying to explain differences in social distancing behavior across individuals and across places.

A.2.4 Additional Detail on Mobility Effects By Type of Establishment

We continue our analysis by disaggregating our mobility measures, honing in on the types of visits that seem to change in places with high levels of friend exposure. We continue to estimate equation A.6, with Y_{it} now corresponding to the log of one plus the number of POIs visited in a given ZCTA i per week t, split by the type of establishment. Again, we control for county $\times$ time fixed effects together with ZCTA fixed effects and ZCTA-level covariates interacted with time fixed effects. The covariates are the same as in Section A.2.3. We cluster standard errors at the ZCTA-level.

Figure A.15 shows coefficient estimates for β_t, with each panel corresponding to a different type of destination. For reference, we include results for all POIs aggregated in the gray series. The patterns are consistent with the hypothesis that people in places with high friend exposure to Covid-19 disproportionately reduce their mobility to avoid unnecessary physical interactions. While differential responses in POI visits are negative for nonessential POIs in Panels (a)-(c), they are close to zero and insignificant for essential POIs in Panels (d)-(f). More concretely, the coefficient estimates for arts, recreation, and entertainment locations (Figure A.15a) show that the difference in the change of visits between high- and low-exposure places can be as large as 0.05 log points (in absolute magnitude). Similar effects can be observed for retail destinations (Figure A.15b), and restaurants and bars (Figure A.15c). Although coefficient estimates return to zero well before the end of the sample period, they are negative and highly significant for the period from mid-March to mid-April. In contrast, coefficient estimates for visits of food and beverage stores (Figure A.15d), health care and social assistance (Figure A.15e) and parks (Figure A.15f) are insignificant and substantially smaller, suggesting that there is no differential reduction in these types of visits among individuals with differential friend exposure to Covid-19. Reassuringly, all coefficient estimates in every panel are very close to zero prior to March, indicating no differential

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behavior before the outbreak of the pandemic. Note that since friend exposure is defined within counties—and distancing policies were nearly always administered at the federal, state, or county level—differences in business closures across places are unlikely to drive our results.

A.3 Post and Group Classifications

To classify posts and groups in certain analyses, we use regular expression searches. Posts or groups are flagged if they match one more of the regular expressions described.

We classify public Facebook posts made between February 3rd and May 3rd according to the regular expressions in Table A.25. Posts that match any of "neutral lockdown", "pro-lockdown", or "anti-lockdown" are classified as Covid-19 posts.

We classify public Facebook groups as a 'Reopen Group' if it was created between March 1st and June 28th, 2020 and has a (case-insensitive) name that matches one of the following regular expressions, with "%" corresponding to a wildcard that can capture any number of characters (including 0): "%reopen%", "%liberate%", "%end%shutdown%", "%end%lockdown%", "%against%quarantine%."

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A.4 Additional Tables

Table A.1: Summary Characteristics - Group Membership Sample

	Mean	SD	P10	P25	P50	P75	P90
Age	41.97	16.01	24	29	39	53	64
Female	0.57	0.50	0	0	1	1	1
Has College	0.59	0.49	0	0	1	1	1
Zip Code Income	$63,798	$26,081	$36,954	$45,848	$57,600	$76,544	$99,328
Has iPhone	0.61	0.49	0	0	1	1	1
Has Tablet	0.43	0.50	0	0	0	1	1
Number of Friends	502.52	319.56	177	252	410	676	1003
Friend Exposure to Cases	12.42	22.17	0.91	2.23	5.64	13.77	31.75
Number Groups (Feb)	33.03	57.89	3	8	18	38	73
Has Any Groups (Feb)	0.98	0.13	1	1	1	1	1
Number Anti-Lockdown Groups (April)	0.014	0.133	0	0	0	0	0
Has Anti-Lockdown Group (April)	0.012	0.110	0	0	0	0	0

Note: Table presents summary statistics describing users in our sample underlying the analysis of group memberships. Individual-level characteristics include age, gender, whether the user has a college listed on Facebook, whether the user primarily accesses Facebook mobile from an iPhone, whether the individual has accessed Facebook from a tablet, number of friends, friend exposure to Covid-19 cases on March 15th, and patterns of mobility during the week of February 25th to March 2nd. The table also includes information on the users' home ZCTA 2018 median household income.

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Table A.2: Change in Probability of Staying at Home

	Stay at Home					
	All		Weekdays		Weekends	
	Level Feb	ΔFeb-Apr	Level Feb	ΔFeb-Apr	Level Feb	ΔFeb-Apr
Overall	18.33	13.68	16.83	13.58	19.39	14.29
By Age Group						
18-34	14.49	13.17	13.23	13.30	14.54	13.12
35-54	16.57	13.22	14.95	13.13	17.98	13.79
55+	25.68	14.99	24.10	14.64	27.04	16.29
By Gender						
Female	20.15	15.68	18.72	15.76	21.19	15.89
Male	16.21	11.33	14.62	11.02	17.26	12.39
By College						
Has College	17.66	15.27	16.11	15.33	18.94	15.48
No College	19.10	11.84	17.66	11.56	19.90	12.89
By Zip Code Income						
Bottom Tertile	19.27	11.54	17.84	11.29	19.96	12.50
Middle Tertile	18.19	12.78	16.69	12.65	19.33	13.43
Top Tertile	17.55	16.69	15.98	16.76	18.88	16.85
By County Total Cases/Population						
Bottom Tertile	18.62	10.86	17.15	10.65	19.75	11.66
Middle Tertile	17.97	15.17	16.56	15.07	18.71	15.84
Top Tertile	18.15	16.75	16.55	16.80	19.30	17.02
By Exposure through Friends						
High Exposure	18.46	14.82	16.97	14.77	19.45	15.34
Low Exposure	18.21	12.55	16.70	12.40	19.33	13.23

Note: Table describes changes in social distancing across different user characteristics. Social distancing is measured as the average probability of staying home. Characteristic splits include age group, gender, whether the user has a college listed on Facebook, the tertile of home ZCTA median household income, the tertile of county-level cases per resident as of March 15th, and whether the log of friend exposure to Covid cases on March 15th is above (high exposure) or below (low exposure) the user's home ZCTA median. Columns 1, 3, and 5 show the levels for the week of February 25th to March 2nd (prior to the pandemic). Columns 2, 4, 6 show the difference between the week of April 14th to 20th (during the early stages of the pandemic) and this baseline. Columns 1 and 2 include movement on all days; 3 and 4 include weekdays only; and 5 and 6 include weekends only.

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Table A.3: Change in Average Tiles Visited

	Bing Tiles Visited					
	All		Weekdays		Weekends	
	Level Feb	ΔFeb-Apr	Level Feb	ΔFeb-Apr	Level Feb	ΔFeb-Apr
Overall	10.957	-3.590	11.339	-3.632	10.570	-3.714
By Age Group						
18-34	11.590	-3.593	11.883	-3.587	11.555	-3.843
35-54	11.507	-3.753	11.952	-3.818	10.975	-3.834
55+	9.287	-3.307	9.656	-3.358	8.804	-3.381
By Gender						
Female	9.729	-3.641	9.937	-3.697	9.694	-3.711
Male	12.398	-3.530	12.985	-3.555	11.602	-3.717
By College						
Has College	11.041	-3.945	11.395	-4.012	10.714	-4.014
No College	10.862	-3.179	11.275	-3.193	10.405	-3.362
By Zip Code Income						
Bottom Tertile	10.735	-3.146	11.110	-3.147	10.392	-3.372
Middle Tertile	10.899	-3.367	11.265	-3.386	10.530	-3.525
Top Tertile	11.238	-4.247	11.642	-4.353	10.787	-4.228
By County Total Cases/Population						
Bottom Tertile	10.670	-2.916	11.006	-2.883	10.358	-3.186
Middle Tertile	11.317	-4.066	11.713	-4.129	10.939	-4.174
Top Tertile	11.140	-4.246	11.579	-4.382	10.643	-4.174
By Exposure through Friends						
High Exposure	10.959	-3.849	11.333	-3.900	10.599	-3.968
Low Exposure	10.956	-3.331	11.345	-3.365	10.542	-3.460

Note: Table describes changes in social distancing across different user characteristics. Social distancing is measured as the average number of daily Bing tiles visited. Characteristic splits include age group, gender, whether the individual has college information in Facebook, the tercile of ZCTA-level median household income, the tercile of county-level cases per resident as of March 15th, and whether the log of friend exposure to Covid-19 cases on March 15th is above (high exposure) or below (low exposure) the users' home ZCTA median. Columns 1, 3, and 5 show the levels for the week of February 25th to March 2nd (prior to the pandemic). Columns 2, 4, 6 show the difference between the week of April 14th to 20th (during the early stages of the pandemic) and this baseline. Columns 1 and 2 include all days; 3 and 4 include weekdays only; and 5 and 6 include weekends only.

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Table A.4: Summary Characteristics - Mobility Sample, by Exposure

Panel A: Above Median ZCTA Friend Exposure

	Mean	SD	P10	P25	P50	P75	P90
Age	43.47	14.84	26	32	41	53	63
Female	0.52	0.50	0	0	1	1	1
Has College	0.57	0.49	0	0	1	1	1
Has iPhone	0.25	0.43	0	0	0	1	1
Has Tablet	0.54	0.50	0	0	1	1	1
Zip Code Income	$58,791	$21,958	$36,160	$43,648	$53,992	$69,216	$88,128
Number of Friends	557.66	333.32	202	293	469	757	1083
Friend Exposure to Cases	14.49	23.98	1.89	3.50	7.41	16.12	35.75

Panel B: Below Median ZCTA Friend Exposure

	Mean	SD	P10	P25	P50	P75	P90
Age	43.68	15.01	25	32	42	54	63
Female	0.55	0.50	0	0	1	1	1
Has College	0.49	0.50	0	0	0	1	1
Has iPhone	0.24	0.43	0	0	0	0	1
Has Tablet	0.52	0.50	0	0	1	1	1
Zip Code Income	$58,794	$21,963	$36,168	$43,656	$53,988	$69,216	$88,096
Number of Friends	507.97	317.84	186	262	414	677	1007
Friend Exposure to Cases	6.21	11.81	0.45	0.95	2.42	6.11	15.03

Note: Table presents summary statistics describing individuals analyzed in our mobility sample of users, as in Table 1. The top and bottom panels present summaries for individuals above and below their ZCTA median friend exposure, respectively.

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Table A.5: Relationship Between Friend Exposure and Individual Characteristics

	DV: log(Friend Exposure)				
Age Group					
35-54	-0.005***			0.017***	
	(0.002)			(0.001)	
55+	-0.055***			0.022***	
	(0.004)			(0.001)	
Female	-0.100***			-0.015***	
	(0.001)			(0.001)	
Has College	0.185***			0.052***	
	(0.003)			(0.001)	
Has iPhone	0.090***			0.004***	
	(0.002)			(0.001)	
Has Tablet	0.045***			0.014***	
	(0.001)			(0.000)	
Zip Code Income					
Middle Tertile	0.120***				
	(0.019)				
Top Tertile	0.415***				
	(0.019)				
County Cases/Pop					
Middle tertile	1.030***				
	(0.015)				
Top Tertile	1.676***				
	(0.020)				
Zip Code FE		Y	Y	Y	
Other network exposure FE			Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone					Y
R-Squared	0.377	0.671	0.851	0.851	0.873
Sample Mean	1.458	1.458	1.458	1.458	1.487
N	6,803,762	6,803,761	6,803,761	6,803,761	6,400,738

Note: Table shows results from regressing various measures on the log of friend exposure to Covid-19 cases on March 15th. Each observation is an individual. Column 1 includes controls for age groups, gender, whether the individual has a college listed on Facebook, whether the individual primarily accesses mobile Facebook from an iPhone, whether the individual has accessed Facebook from a tablet, the tertile of home ZCTA median household income, and the tertile of home county cases per resident as of March 15th. Column 2 includes only ZCTA fixed effects. Column 3 adds percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Column 4 adds back the individual-level controls from column 1. Column 5 adds fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.6: Determinants of Change in Friend Exposure to Covid-19 by Month

	Monthly Change Friend Exposure									
	March	April	May	June	July	March	April	May	June	July
Age Group										
35-54	0.040***	0.014***	-0.013***	-0.008***	-0.001**	0.015***	0.005***	-0.004***	-0.003***	0.001***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
55+	0.076***	0.015***	-0.026***	-0.018***	-0.004***	0.024***	0.007***	-0.006***	-0.006***	0.001
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Female	-0.021***	0.006***	0.003***	0.006***	0.004***	-0.004***	0.002***	0.001***	0.000**	-0.000***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Has College	0.039***	-0.031***	-0.007***	-0.008***	-0.004***	0.003***	-0.013***	-0.003***	0.002***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Has iPhone	0.011***	0.005***	-0.007***	0.008***	0.013***	0.002***	-0.002***	-0.000	0.002***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Has Tablet	0.005***	-0.009***	-0.008***	-0.001***	0.002***	0.003***	-0.002***	-0.002***	-0.000***	0.001***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Network-Exposure Median HH Income ($k)	0.015***	-0.004***	0.001***	-0.009***	-0.013***					
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)					
Network-Exposure Population Density	349.495***	-34.302***	-65.142***	-71.383***	-88.601***					
(residents/meter^2)	(5.622)	(1.527)	(1.280)	(1.582)	(1.764)					
Network-Exposure Fraction of Pop. Urban	1.112***	-0.076**	-0.263***	0.319***	0.456***					
	(0.035)	(0.019)	(0.016)	(0.014)	(0.016)					
Zip Code Income										
Middle Tertile	-0.034***	-0.017**	0.007	-0.011**	-0.004					
	(0.011)	(0.008)	(0.006)	(0.005)	(0.006)					
Top Tertile	0.002	-0.026***	-0.008	-0.006	0.005					
	(0.011)	(0.008)	(0.005)	(0.005)	(0.006)					
Zip Code FE						Y	Y	Y	Y	Y
Other Network Exposure FE						Y	Y	Y	Y	Y
R-Squared	0.560	0.044	0.117	0.215	0.281	0.877	0.680	0.728	0.781	0.822
Sample Mean	2.800	2.303	0.810	0.476	0.615	2.800	2.303	0.810	0.476	0.615
N	7,090,255	6,981,142	6,571,618	6,251,614	5,859,728	7,090,254	6,981,141	6,571,617	6,251,614	5,859,728

Note: Table shows results from regressing various measures on the change in log of friend exposure to Covid cases per 100k residents between the last Fridays of each month (e.g. February to March in column 1). Columns 1-5 include age groups; gender; whether the individual has a college listed on Facebook; whether the individual primarily accesses the Facebook app from an iPhone; whether the individual has accessed Facebook from a tablet; friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas; and the tercile of ZCTA-level median household income. Columns 6-10 control for ZCTA fixed effects and percentiles of the friend weighted exposure metrics. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.7: Mobility Sample Summary by Month

	February	March	April	May	June	July	August
Age	44.83	45.01	45.06	45.20	45.32	45.41	45.49
	(14.87)	(14.92)	(14.92)	(14.91)	(14.91)	(14.91)	(14.92)
Female	0.54	0.54	0.54	0.54	0.54	0.54	0.54
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Has College	0.53	0.53	0.53	0.53	0.53	0.53	0.53
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Has iPhone	0.18	0.18	0.17	0.16	0.16	0.15	0.15
	(0.39)	(0.39)	(0.38)	(0.37)	(0.36)	(0.36)	(0.35)
Has Tablet	0.53	0.53	0.53	0.53	0.53	0.53	0.53
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Zip Code Income	$58,651.00	$58,597.00	$58,509.00	$58,571.00	$58,624.00	$58,656.00	$58,681.00
	(21689)	(21674)	(21641)	(21659)	(21669)	(21673)	(21692)
Number of Friends	519.92	520.00	519.22	517.86	517.21	516.05	515.40
	(321.70)	(322.10)	(321.76)	(321.11)	(320.79)	(320.42)	(320.25)
Friend Exposure to Cases	10.05	10.00	9.98	10.01	10.01	10.01	10.01
	(18.94)	(18.87)	(18.85)	(18.88)	(18.89)	(18.90)	(18.91)
N	8,306,154	7,985,569	7,788,454	7,327,655	6,865,099	6,440,827	6,036,002

Note: Table shows averages and standard deviations (in parenthesis) of observable demographics for users in the mobility sample by month. A user is only included if their mobility data (described in Section 1.1) is available for that particular month.

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Table A.8: Social Distancing by Demographics: Probability of Staying at Home

	DV: Δ Stay at Home (Feb - Apr)							
Age Group								
35-54	-0.394***	-0.360***		-0.347***				
	(0.036)	(0.032)		(0.032)				
55+	1.381***	1.544***		1.589***				
	(0.045)	(0.038)		(0.037)				
Female	4.404***	4.718***		4.852***				
	(0.031)	(0.030)		(0.029)				
Has College	2.876***	2.538***		2.228***				
	(0.029)	(0.026)		(0.025)				
Has iPhone	0.147***	-0.332***		-0.465***				
	(0.035)	(0.032)		(0.032)				
Has Tablet	0.936***	0.900***		0.851***				
	(0.024)	(0.023)		(0.023)				
Zip Code Income								
Middle Tertile	1.001***							
	(0.109)							
Top Tertile	3.671***							
	(0.109)							
County Cases/Pop								
Middle tertile	3.816***							
	(0.089)							
Top Tertile	5.105***							
	(0.120)							
log(Friend Exposure)			0.923***	0.849***	0.878***	0.825***	0.919***	0.961***
			(0.026)	(0.026)	(0.028)	(0.037)	(0.030)	(0.045)
Zip Code FE		Y	Y	Y				
Other Network Exposure FE			Y	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone					Y	Y	Y	Y
College FE								Y
Sample						Weekend	Weekday	College
R-Squared	0.021	0.041	0.035	0.044	0.175	0.159	0.174	0.193
Sample Mean	13.683	13.683	13.683	13.683	13.800	14.415	13.704	15.852
N	6,804,168	6,804,167	6,803,761	6,803,761	6,400,738	5,808,187	6,309,820	2,616,959

Note: Table shows results from regression A.1. Each observation is an individual. The outcome in all columns is the change in probability of staying at home from the week of February 25-March 2, 2020 (prior to the pandemic) to April 14-20, 2020. Column 1 includes controls for age groups, gender, whether the individual has a college listed on Facebook, whether the individual primarily accesses Facebook mobile from an iPhone, whether the individual has accessed Facebook from a tablet, the tertile of home ZCTA median household income, and the tertile of home county cases per resident as of March 15th. Column 2 adds ZCTA fixed effects, but maintains the individual level controls. Column 3 includes only the log of friend exposure to Covid cases on March 15th; ZCTA fixed effects; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Column 4 adds back the individual-level controls from column 1. Column 5 adds fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. In Column 6 the outcome is measured using weekend movement and in column 7 using weekday movement. Column 8 limits to individuals that attended a college, limiting to colleges with more than 100 individuals, and adds a fixed effect for each individual college. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.9: Social Distancing and Other Exposure

	DV: Δ Stay at Home (Feb - Apr)							
log(Friend Exposure)	0.878***	0.521***		0.872***	0.875***	0.876***	0.872***	0.861***
	(0.028)	(0.043)		(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
log(Friend Exposure, Cases per 100k)			0.778***					
			(0.029)					
Share Friends China				1.116***				1.075***
				(0.090)				(0.089)
Share Friends South Korea					0.215***			0.207***
					(0.022)			(0.021)
Share Friends Italy						0.068***		0.053***
						(0.014)		(0.014)
Share Friends Spain							0.209***	0.200***
							(0.022)	(0.022)
Sample		Friends >100mi						
Other Network Exposure FE	Y	Y	Y	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y	Y	Y	Y	Y
R-Squared	0.175	0.229	0.175	0.175	0.175	0.175	0.175	0.175
Sample Mean	13.800	14.876	13.800	13.800	13.800	13.800	13.800	13.800
N	6,400,738	2,479,352	6,400,738	6,400,738	6,400,738	6,400,738	6,400,738	6,400,738

Note: Table shows results from regression A.1, using alternative measures of friend exposure to Covid-19. Each observation is an individual. The outcome in all columns is the percent reduction in average number of Bing tiles visited from the week of February 25th to March 2nd (prior to the pandemic) to April 14th to 20th. Column 1 is the same specification as column 5 of Table A.8. Column 2 limits exposure to only friendships with individuals in counties more than 100 miles away. The sample size falls as we restrict to individuals with more than 100 such friends (as described in Section 1.1, we use a similar friend count including *all* friends in our primary sample). Column 3 uses cases per 100k residents (instead of cases) to calculate friend exposure. Columns 4, 5, 6, and 7 add controls for the share of friends individuals have in China, South Korea, Italy, and Spain respectively. Column 8 adds all four of these country controls at once. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Table A.10: Effects of Friend Exposure by Month: Δ Prob. of Staying at Home, Robustness

	Monthly Change in Prob. Stay at Home								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Change Friend Exposure, Same Month	4.753***	1.479***	1.465***	0.208***	0.263***	0.207***	0.183***	0.203***	0.236***
	(0.004)	(0.023)	(0.024)	(0.029)	(0.036)	(0.033)	(0.049)	(0.034)	(0.039)
Sample						Excl. March	Excl. March	Full Panel	Full Panel
Zip Code		Y X Month							
Other Network Exposure FE				Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone			Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month
User FE					Y		Y		Y
R-Squared	0.037	0.081	0.210	0.211	0.287	0.154	0.272	0.239	0.275
Sample Mean	1.582	1.582	1.611	1.611	1.456	-1.894	-1.974	1.308	1.308
N	32,754,357	32,754,354	30,742,008	30,742,008	29,777,929	24,053,560	22,902,553	21,812,115	21,812,115

Note: Table shows results from robustness versions of regression 5. Columns 4 is the same as column 1 of Table 2. In Column 1 we drop all controls. In columns 2 and 3 we include only ZCTA-by-month and only ZCTA-by-month-by-observable group fixed effects, respectively. In columns 6-7 we exclude the first month, March. In columns 8-9 we only include users for which every month of data is available. Columns 5, 7, and 9 include fixed effects for each user. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.11: Effects of Friend Exposure by Month: Number of Tiles Visited

	% Change in Bing Tiles Visited		# of Bing Tiles Visited	
Change Friend Exposure, Same Month	-0.568***	-0.934***	-0.038***	-0.003***
	(0.117)	(0.123)	(0.005)	(0.001)
Specification	OLS	OLS	OLS	Poisson
Other Network Exposure FE	Y x Month	Y X Month	Y X Month	Y X Month
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y x Month	Y X Month	Y X Month	Y X Month
User FE		Y	Y	Y
(Pseudo) R-Squared	0.016	0.035	0.261	0.565
Sample Mean	20.81	20.76	8.86	8.86
N	30,742,008	29,777,929	29,777,929	29,777,929

Note: Table reports results of versions of regression 5 with different outcomes and functional forms. As in columns 1-2 of Table 2, there is one observation per user per month between March 2020 and July 2020. In columns 1-2 the outcome is the percentage change in the number of Bing tiles visited from last week of the prior month to the last week of the current month. In columns 3-4 the outcome is the number of Bing tiles visited. Columns 2-4 include user fixed effects. All columns include the ZCTA-by-demographic controls and percentiles of friend-exposure controls described in Table 2. In column 4 we show results of analogous Poisson Pseudo-Maximum Likelihood regression model. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

Table A.12: Effects of Friend Exposure by Month: Δ Probability of Staying at Home

	Monthly Change in Prob. Stay at Home				
	March	April	May	June	July
Change Friend Exposure, March	0.207***				
	(0.046)				
Change Friend Exposure, April		0.032			
		(0.048)			
Change Friend Exposure, May			0.460***		
			(0.073)		
Change Friend Exposure, June				0.577***	
				(0.089)	
Change Friend Exposure, July					0.076
					(0.089)
Other Network Exposure FE	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y	Y
R-Squared	0.174	0.141	0.150	0.146	0.145
Sample Mean	14.214	-0.923	-5.989	-1.068	0.679
N	6,688,448	6,579,359	6,169,176	5,848,722	5,456,303

Note: Table shows results from a regression similar to Equation 5, splitting out the changes in friend exposure and probability of staying at home by month. Each observation is an individual. The outcome variable is the change in the probability of staying home between the final weeks of a given month and the previous months' final week: February 25-March 2 for February; March 24-March 30 for March; April 21-April 27 for April; May 26-June 1; June 23-June 29; July 21-July 28. We consider changes by month. In all columns we control for interactions of age groups, gender, whether the individual has a college listed on Facebook, whether the individual primarily accesses mobile Facebook from an iPhone, and whether the individual has accessed Facebook from a tablet. We also control for fixed effects for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.13: Heterogeneity of Monthly Friend-Exposure Effects, All Days

	Monthly Change in Prob. Stay at Home, All Days						
Change Friend Exposure x I(Age < 35)	0.208***						
	(0.020)						
Change Friend Exposure x I(Age 35-55)	0.098***						
	(0.015)						
Change Friend Exposure x I(Age > 55)	-0.034*						
	(0.020)						
Change Friend Exposure x Female		0.125***					
		(0.015)					
Change Friend Exposure x Male		0.055***					
		(0.015)					
Change Friend Exposure x College			0.162***				
			(0.014)				
Change Friend Exposure x No College			0.016				
			(0.015)				
Change Friend Exposure x Zip Income First Tertile				0.003			
				(0.018)			
Change Friend Exposure x Zip Income Second Tertile				0.048***			
				(0.017)			
Change Friend Exposure x Zip Income Third Tertile				0.268***			
				(0.020)			
Change Friend Exposure x County Cases First Tertile					0.027*		
					(0.014)		
Change Friend Exposure x County Cases Second Tertile					0.107***		
					(0.023)		
Change Friend Exposure x County Cases Third Tertile					0.219***		
					(0.022)		
Change Friend Exposure, Friends Ranked 1 - 25						0.067***	
						(0.011)	
Change Friend Exposure, Friends Ranked 26 - 50						0.024**	
						(0.011)	
Change Friend Exposure, Friends Ranked 51 - 75						0.004	
						(0.011)	
Change Friend Exposure, Friends Ranked 76 - 100						0.002	
						(0.011)	
Change Friend Exposure, Friends <100mi Away							0.543***
							(0.054)
Change Friend Exposure, Friends >100mi Away							0.171***
							(0.039)
Other Network Exposure FE	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month	Y X Month
R-Squared	0.211	0.211	0.211	0.211	0.211	0.211	0.268
Sample Mean	1.611	1.611	1.611	1.611	1.611	1.611	1.805
F Test (Rank 1-25 = Rank 76-100)						15.187***	
N	30,742,008	30,742,008	30,742,008	30,742,008	30,742,008	30,742,008	30,742,008

Note: Table results from the same regressions as Table 3, but with the outcome variable as the change in movement on *all days*, rather than on the weekend only. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.14: Monthly Friend-Exposure Effects: Close vs. Far Friends

	Monthly Change in Prob. Stay at Home	
	All Days	Weekends
Change Friend Exposure, Friends Ranked 1-50, <100mi	0.240***	0.201**
	(0.059)	(0.093)
Change Friend Exposure, Friends Ranked 51-100, <100mi	0.310***	0.190**
	(0.055)	(0.086)
Change Friend Exposure, Friends Ranked 1-50, >100mi	0.140***	0.214***
	(0.030)	(0.046)
Change Friend Exposure, Friends Ranked 51-100, >100mi	0.093***	0.135***
	(0.031)	(0.047)
Other Network Exposure FE X Month, All Dist	Y	Y
Other Network Exposure FE X Month, >100mi	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y
R-Squared	0.273	0.250
Sample Mean	1.817	1.624
N	11,235,194	10,165,136

Note: Table shows results from versions of regression 5, similar to column 1 of Table 2. Here, we amend regression 5 by replacing $ChangeFriendExposure_{it}$ with four analogous variables constructed using exposure from individuals who live within (outside) 100 miles and are in user's the closest 50 (51-100) friends. Both columns are restricted to users that have at least 100 friends <100 miles away and >100 miles away (the same minimum restriction used for *overall* friends elsewhere). In column 1 the outcome variable is the change in the probability of staying home using data from all days. Column 3 uses data on weekend movement. In both columns we control for interactions of ZCTA fixed effects, age groups, gender, whether the individual has a college listed on Facebook, whether the individual primarily accesses mobile Facebook from an iPhone, and whether the individual has accessed Facebook from a tablet. Both columns also include fixed effects for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. We control for this measure both among all friends and friends >100mi away. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.15: Heterogeneity of Early Friend-Exposure Effects: Probability of Staying Home

	%Δ Stay at Home					
log(Friend Exposure) x I(Age < 35)	1.241***					
	(0.042)					
log(Friend Exposure) x I(Age 35-55)	0.960***					
	(0.033)					
log(Friend Exposure) x I(Age > 55)	0.412***					
	(0.038)					
log(Friend Exposure) x Female		0.949***				
		(0.032)				
log(Friend Exposure) x Male		0.796***				
		(0.033)				
log(Friend Exposure) x College			1.321***			
			(0.034)			
log(Friend Exposure) x No College			0.443***			
			(0.031)			
log(Friend Exposure) x Zip Income First Tertile				0.386***		
				(0.037)		
log(Friend Exposure) x Zip Income Second Tertile				0.794***		
				(0.036)		
log(Friend Exposure) x Zip Income Third Tertile				1.608***		
				(0.045)		
log(Friend Exposure) x County Cases First Tertile					0.676***	
					(0.030)	
log(Friend Exposure) x County Cases Second Tertile					1.384***	
					(0.058)	
log(Friend Exposure) x County Cases Third Tertile					1.245***	
					(0.055)	
log(Friend Exposure - Rank 1 - 25)						0.204***
						(0.017)
log(Friend Exposure - Rank 26 - 50)						0.112***
						(0.017)
log(Friend Exposure - Rank 51 - 75)						0.082***
						(0.017)
log(Friend Exposure - Rank 76 - 100)						0.098***
						(0.017)
Other Network Exposure FE	Y	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y	Y	Y
R-Squared	0.175	0.175	0.175	0.175	0.175	0.177
Sample Mean	13.800	13.800	13.800	13.800	13.800	14.488
F Test (Rank 1-25 = Rank 76-100)						17.328***
N	6,400,738	6,400,738	6,400,738	6,400,738	6,400,738	5,684,469

Note: Table shows results from regressions of friend exposure to Covid-19 on March 15th, interacted with individual characteristics, on the percentage change in the probability of staying at home. Friend exposure is interacted with age groups in rows 1-3; gender in rows 4-5; whether the individual has a college listed in Facebook in rows 6-7; ZCTA median household income in rows 8-10; county-level cases of Covid-19 in rows 11-13; and friend rank (i.e. a measure for how close friends are) in rows 14-16. All columns include controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. All columns include fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.16: Heterogeneity of Early Friend-Exposure Effects: Average Daily Tiles Visited

	%Δ Bing Tiles Visited					
log(Friend Exposure) x I(Age < 35)	1.942***					
	(0.146)					
log(Friend Exposure) x I(Age 35-55)	1.860***					
	(0.114)					
log(Friend Exposure) x I(Age > 55)	0.535***					
	(0.123)					
log(Friend Exposure) x Female		1.125***				
		(0.100)				
log(Friend Exposure) x Male		1.971***				
		(0.123)				
log(Friend Exposure) x College			2.030***			
			(0.107)			
log(Friend Exposure) x No College			1.006***			
			(0.114)			
log(Friend Exposure) x Zip Income First Tertile				0.576***		
				(0.136)		
log(Friend Exposure) x Zip Income Second Tertile				1.289***		
				(0.122)		
log(Friend Exposure) x Zip Income Third Tertile				2.990***		
				(0.135)		
log(Friend Exposure) x County Cases First Tertile					0.926***	
					(0.104)	
log(Friend Exposure) x County Cases Second Tertile					2.429***	
					(0.183)	
log(Friend Exposure) x County Cases Third Tertile					3.087***	
					(0.168)	
log(Friend Exposure - Rank 1 - 25)						0.463***
						(0.058)
log(Friend Exposure - Rank 26 - 50)						0.097
						(0.060)
log(Friend Exposure - Rank 51 - 75)						-0.062
						(0.059)
log(Friend Exposure - Rank 76 - 100)						0.139**
						(0.059)
Other Network Exposure FE	Y	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y	Y	Y
R-Squared	0.154	0.154	0.154	0.154	0.154	0.156
Sample Mean	15.801	15.801	15.801	15.801	15.801	17.436
F Test (Rank 1-25 = Rank 76-100)						13.393***
N	6,400,738	6,400,738	6,400,738	6,400,738	6,400,738	5,684,469

Note: Table shows results from regressions of friend exposure to Covid-19 on March 15th, interacted with individual characteristics, on the percentage change in average tile movement. Each observation is an individual. Friend exposure is interacted with age groups in rows 1-3; gender in rows 4-5; whether the individual has a college listed in Facebook in rows 6-7; zip-level median household income in rows 8-10; county-level cases of Covid-19 in rows 11-13; and friend rank (i.e. a measure for how close friends are) in rows 14-16. All columns include controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. All columns include fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.17: Posting Behavior and Group Membership, Additional Results

	DV: Share Posts about Covid-19 (Feb - Apr)	DV: Share "Signed Posts" Opposed to Distancing (Feb - Apr)	DV: Member "Reopen Group" by June 28, 2020	DV: Δ Sentiment (Feb - Apr) All Posts	
log(Friend Exposure)	0.324***	-1.659***	-0.003	-0.109***	-0.094***
	(0.006)	(0.107)	(0.018)	(0.016)	(0.025)
Age Group					
35-54	0.579***	-2.196***	0.767***	-0.480***	
	(0.005)	(0.168)	(0.011)	(0.026)	
55+	0.351***	4.667***	0.851***	-0.031	
	(0.005)	(0.194)	(0.012)	(0.030)	
Female	-0.266***	-17.713***	-0.582***	0.942***	
	(0.003)	(0.142)	(0.010)	(0.024)	
Has College	0.637***	-2.392***	-0.188***	-0.283***	
	(0.004)	(0.141)	(0.006)	(0.023)	
Has iPhone	0.137***	-7.215***	0.019***	-0.150***	
	(0.003)	(0.135)	(0.006)	(0.023)	
Has Tablet	0.028***	-1.997***	-0.048***	0.039*	
	(0.003)	(0.125)	(0.003)	(0.023)	
Zip Code Income					
Middle Tertile	0.069***	-0.886***	0.211***	-0.075*	
	(0.013)	(0.229)	(0.041)	(0.031)	
Top Tertile	0.269***	-1.946***	0.379***	-0.121***	
	(0.016)	(0.250)	(0.044)	(0.035)	
County Cases/Pop					
Middle tertile	-0.064***	1.458***	0.219***	0.027	
	(0.014)	(0.256)	(0.049)	(0.037)	
Top Tertile	-0.097***	1.049***	0.204***	0.034	
	(0.013)	(0.240)	(0.048)	(0.036)	
Percentiles of Total Number of Groups (Feb 2020)			Y		
Other Network Exposure FE	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone					Y
Sample	People With Any Posts Feb - April	People With "Signed Posts" Feb - April	People With Group Memberships	People With Posts between Feb 3 and May 3	
R-Squared	0.013	0.087	0.013	0.000	0.118
Sample Mean	1.750	39.806	1.217	-1.817	-1.823
N	34,828,054	546,499	119,384,394	11,209,068	10,777,790

Note: Table shows results from regressions 6 and 7, similar to Table 4. Each observation is an individual. The outcome in column 1 is the percentage of individual posts that are about Covid-19; in column 2 it is the percentage of pro- or anti-distancing posts that are anti-distancing; in column 3 it is whether the individual was a member of a 'Reopen' Facebook group as of June 28th; in columns 4-5 it is the change in the average sentiment of the posts from February 3rd through 23rd to April 6th through 26th. For ease of interpretation and because of small magnitudes, we rescale coefficients and standard errors by 100, so that they correspond to percentages. Post classification is based on the regex in Appendix A.3. Group classification is determined by the regular expression described in Appendix A.3. Sentiment is measured on a scale from -100 to 100 using the VADER algorithm described in Hutto and Gilbert (2014). Columns 1-4 include controls for the log of friend exposure to Covid-19 on March 15th; age groups; gender; whether the individual has a college listed on Facebook; whether the individual primarily accesses Facebook mobile from an iPhone; whether the individual has accessed Facebook from a tablet; the tertile of home ZCTA median household income; the tertile of home county cases per resident as of March 15th; and percentiles of friend exposures (as described in equation 3) for median household income, population density, and the share of the population living in urban areas. Column 5 adds fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. The group-based analysis in column 3 also include fixed effects for the percentile of the number of groups an individual was in as of February 2020. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.18: Summary Characteristics - Posting Behavior Sample

	Mean	SD	P10	P25	P50	P75	P90
Age	42.40	15.96	24	29	40	53	64
Female	0.58	0.49	0	0	1	1	1
Has College	0.60	0.49	0	0	1	1	1
Zip Code Income	$61,284	$23,993	$36,729	$44,902	$55,662	$72,704	$94,000
Has iPhone	0.59	0.49	0	0	1	1	1
Has Tablet	0.47	0.50	0	0	0	1	1
Number of Friends	564.85	341.16	196	289	477	776	1103
Friend Exposure to Cases	10.31	19.68	0.78	1.84	4.55	10.83	25.16
Number of Posts Feb	16.12	64.85	0	0	1	8	34
Average Sentiment (Feb)	31.89	35.26	-3.41	3.50	29.91	58.00	83.00
Number of Posts April	20.83	74.95	0	0	2	13	47
Average Sentiment (April)	29.94	34.21	-4.75	3.86	27.80	53.84	79.47
Number Posts about Corona	0.724	4.687	0	0	0	0	2
Average Sentiment Corona Posts	21.46	52.79	-52.75	-10.13	21.09	66.71	93.37
Number Posts Support Lockdown	0.013	0.238	0	0	0	0	0
Number Posts Oppose Lockdown	0.008	0.118	0	0	0	0	0

Note: Table presents summary statistics describing users in our sample underlying the analysis of public posts. Individual-level characteristics include age, gender, whether the user has a college listed on Facebook, whether the user primarily accesses Facebook mobile from an iPhone, whether the individual has accessed Facebook from a tablet, number of friends, friend exposure to Covid-19 cases on March 15th, and patterns of mobility during the week of February 25th to March 2nd. The table also includes information on the 2018 median household income of users' home ZCTA.

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Table A.19: Monthly Exposure and Group Membership - Cases per 100k

	Member "Reopen Group" by June 28, 2020				
log (Friend Exposure March 15, Cases per 100k)	-0.069***				
	(0.007)				
log (Friend Exposure End of March, Cases per 100k)		-0.015			
		(0.011)			
log (Friend Exposure End of April, Cases per 100k)			-0.005		
			(0.011)		
log (Friend Exposure End of May, Cases per 100k)				-0.049***	
				(0.011)	
log (Friend Exposure End of June, Cases per 100k)					-0.148***
					(0.015)
R-Squared	0.074	0.074	0.074	0.074	0.074
Sample Mean	1.216	1.216	1.216	1.216	1.216
N	119,145,833	119,153,784	119,153,786	119,153,786	119,153,786

Note: Table presents results from versions of regression 7. The outcome in all columns is whether the individual was a member of a 'Reopen' Facebook group as of June 28th. In row 1 we use $FriendExposure100k_{it}$ as of March 15th 2020. In rows 2-5 we use analogous exposure measures at the end of March, April, May, and June, respectively. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.20: Heterogeneity of Friend-Exposure Effects - Own Age / Gender / College

	% Posts about Covid-19	% "Signed Posts" Opp. Distancing	Sentiment All Posts	Member "Reopen Group"
log(Friend Exposure) x I(Age < 35)	0.209***	-1.650***	-0.075**	-0.034***
	(0.007)	(0.416)	(0.033)	(0.006)
log(Friend Exposure) x I(Age 35-55)	0.307***	-2.185***	-0.081**	-0.210***
	(0.007)	(0.287)	(0.033)	(0.009)
log(Friend Exposure) x I(Age > 55)	0.213***	-1.572***	-0.143***	-0.127***
	(0.006)	(0.384)	(0.039)	(0.007)
Other Network Exposure FE	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y
R-Squared	0.060	0.445	0.118	0.074
Sample Mean	1.755	35.979	-1.823	1.216
N	34,528,373	277,776	10,777,790	119,145,833

	% Posts about Covid-19	% "Signed Posts" Opp. Distancing	Sentiment All Posts	Member "Reopen Group"
log(Friend Exposure) x Female	0.197***	-1.536***	-0.174***	-0.060***
	(0.006)	(0.262)	(0.028)	(0.006)
log(Friend Exposure) x Male	0.319***	-3.074***	0.034	-0.216***
	(0.007)	(0.388)	(0.034)	(0.008)
Other Network Exposure FE	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y
R-Squared	0.060	0.445	0.118	0.074
Sample Mean	1.755	35.979	-1.823	1.216
N	34,528,373	277,776	10,777,790	119,145,833

	% Posts about Covid-19	% "Signed Posts" Opp. Distancing	Sentiment All Posts	Member "Reopen Group"
log(Friend Exposure) x College	0.352***	-2.281***	-0.122***	-0.171***
	(0.007)	(0.258)	(0.030)	(0.007)
log(Friend Exposure) x No College	0.124***	-0.838**	-0.058*	-0.082***
	(0.005)	(0.399)	(0.031)	(0.000)
Other Network Exposure FE	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y
R-Squared	0.060	0.445	0.118	0.074
Sample Mean	1.755	35.979	-1.823	1.216
N	34,528,373	277,776	10,777,790	119,145,833

Note: Table shows results from regressions of friend exposure to Covid-19 on March 15th, interacted with individual characteristics, on a number of outcomes. Each observation is an individual. Friend exposure is interacted with age groups in rows 1-3; gender in rows 4-5; and whether the individual has a college listed in Facebook in rows 6-7. The outcome in column 1 is the percentage of individual posts that are about Covid-19. In column 2 it is the percentage of pro- or anti-distancing posts that are anti-distancing. In column 3 it is the change in the average sentiment of the posts from February 3 - 23 to April 6 - 26. In column 4 it is whether the individual, as of June 28, was a member of a 'Reopen' Facebook group. Post and group classifications are defined in Appendix A.3. All columns include controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. All columns include fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.21: Heterogeneity of Friend-Exposure Effects - Own Income / Local Cases

	% Posts about Covid-19	% "Signed Posts" Opp. Distancing	Sentiment All Posts	Member "Reopen Group"
log(Friend Exposure) x Zip Income First Tertile	0.163***	-2.155***	-0.034	-0.080***
	(0.007)	(0.377)	(0.033)	(0.011)
log(Friend Exposure) x Zip Income Second Tertile	0.216***	-1.792***	-0.101***	-0.136***
	(0.007)	(0.335)	(0.034)	(0.012)
log(Friend Exposure) x Zip Income Third Tertile	0.404***	-1.884***	-0.172***	-0.185***
	(0.010)	(0.338)	(0.040)	(0.014)
Other Network Exposure FE	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y
R-Squared	0.060	0.445	0.118	0.074
Sample Mean	1.755	35.979	-1.823	1.216
N	34,528,373	277,776	10,777,790	119,145,833
	% Posts about Covid-19	% "Signed Posts" Opp. Distancing	Sentiment All Posts	Member "Reopen Group"
log(Friend Exposure) x County Cases First Tertile	0.190***	-1.904***	-0.086***	-0.115***
	(0.006)	(0.294)	(0.028)	(0.009)
log(Friend Exposure) x County Cases Second Tertile	0.392***	-2.084***	-0.047	-0.158***
	(0.013)	(0.422)	(0.050)	(0.017)
log(Friend Exposure) x County Cases Third Tertile	0.356***	-1.855***	-0.168***	-0.151***
	(0.012)	(0.399)	(0.046)	(0.013)
Other Network Exposure FE	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y
R-Squared	0.060	0.445	0.118	0.074
Sample Mean	1.755	35.979	-1.823	1.216
N	34,528,373	277,776	10,777,790	119,145,833

Note: Table shows results from regressions of friend exposure to Covid-19 on March 15th interacted with various ZCTA-level characteristics on a number of outcomes. Each observation is an individual. Friend exposure is interacted with tertiles of ZCTA median household income in rows 1-3; and tertiles of county cases per resident as of March 15th in rows 4-6. The outcome in column 1 is the percentage of individual posts that are about Covid-19. In column 2 it is the percentage of pro- or anti-distancing posts that are anti-distancing. In column 3 it is the change in the average sentiment of the posts from February 3 - 23 to April 6 - 26. In column 4 it is whether the individual, as of June 28, was a member of a 'Reopen' Facebook group. Post and group classifications are defined in Appendix A.3. All columns include controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. All columns include fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.22: Heterogeneity of Friend-Exposure Effects - Friend Characteristics

	Share Posts about Covid-19 (Feb - Apr)	Share "Signed Posts" Opposed to Distancing (Feb - Apr)	Δ Sentiment (Feb - Apr) All Posts	Member "Reopen Group" by May 24, 2020
log(Friend Exposure - Rank 1 - 25)	0.061***	-0.360***	-0.032**	-0.053***
	(0.002)	(0.149)	(0.016)	(0.002)
log(Friend Exposure - Rank 26 - 50)	0.046***	-0.299*	0.013	-0.036***
	(0.002)	(0.160)	(0.016)	(0.002)
log(Friend Exposure - Rank 51 - 75)	0.033***	-0.433**	0.008	-0.053***
	(0.002)	(0.158)	(0.017)	(0.002)
log(Friend Exposure - Rank 76 - 100)	0.022***	-0.016	-0.037**	-0.051***
	(0.002)	(0.159)	(0.017)	(0.002)
Percentiles of Total Number of Groups (Feb 2020)				Y
Other Network Exposure FE	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y	Y	Y	Y
R-Squared	0.060	0.446	0.122	0.074
Sample Mean	1.869	35.319	-1.869	0.012
F Test (Rank 1-25 = Rank 76-100)	184.345***	2.180	0.045	1.352
N	30,814,578	255,095	9,482,790	108,911,020

Note: Table shows results from regressions of friend exposure to Covid-19 on March 15th, calculated using limited friend sets, on a number of outcomes. Each observation is an individual. Friend exposure is calculated using only subsets friends based on the strength of friendship connections. The outcome in column 1 is the percentage of individual posts that are about Covid-19. In column 2 it is the percentage of pro- or anti-lockdown posts that are anti-distancing. In column 3 it is the change in the average sentiment of the posts from February 3rd through 23rd to April 6th through 26th. In column 4 it is whether the individual, as of June 28th, was a member of a 'Reopen' Facebook group. Post and group classifications are defined in Appendix A.3. All columns include controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. All columns also include fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.23: Social Distancing by Demographics: Percent Reduction in N Tiles Visited

	DV: % Reduction - Bing Tiles Visited (Feb - Apr)							
Age Group								
35-54	1.073***	0.986***		1.012***				
	(0.104)	(0.101)		(0.101)				
55+	3.534***	3.702***		3.842***				
	(0.119)	(0.112)		(0.112)				
Female	9.577***	10.036***		10.285***				
	(0.084)	(0.082)		(0.082)				
Has College	7.347***	6.825***		6.233***				
	(0.085)	(0.081)		(0.081)				
Has iPhone	5.847***	4.934***		4.635***				
	(0.099)	(0.098)		(0.098)				
Has Tablet	0.141*	0.041		-0.057				
	(0.079)	(0.078)		(0.078)				
Zip Code Income								
Middle Tertile	3.467***							
	(0.229)							
Top Tertile	9.432***							
	(0.226)							
County Cases/Pop								
Middle tertile	8.387***							
	(0.204)							
Top Tertile	9.892***							
	(0.227)							
log(Friend Exposure)			1.802***	1.585***	1.514***	1.455***	1.481***	1.473***
			(0.083)	(0.083)	(0.092)	(0.155)	(0.103)	(0.144)
Zip Code FE		Y	Y	Y				
Other Network Exposure FE			Y	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone					Y	Y	Y	Y
College FE								Y
Sample						Weekend	Weekday	College
R-Squared	0.009	0.018	0.015	0.020	0.154	0.155	0.156	0.172
Sample Mean	15.640	15.640	15.641	15.641	15.801	-1.943	12.668	20.942
N	6,804,168	6,804,167	6,803,761	6,803,761	6,400,738	5,808,187	6,309,820	2,616,959

Note: Table shows results from regression A.1. Each observation is an individual. The outcome in all columns is the percent reduction in average number of Bing tiles visited from the week of February 25th to March 2nd (prior to the pandemic) to April 14th to 20th. Column 1 includes controls for age groups, gender, whether the individual has college information in Facebook, whether the individual primarily accesses mobile Facebook from an iPhone, whether the individual has accessed Facebook from a tablet, the tercile of ZCTA-level median household income, and the tercile of county-level cases per resident as of March 15th. Column 2 adds ZCTA fixed effects, but maintains the individual level controls. Column 3 includes only the log of friend exposure to Covid-19 cases on March 15th; ZCTA fixed effects; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Column 4 adds back the individual-level controls from column 1. Column 5 adds fixed effects for every group constructed from interacting ZCTA, age group, gender, has college, has tablet, and has iPhone. In Column 6 the outcome is weekend movement and in column 7 the outcome is weekday movement. Column 8 limits to individuals that attended a college, limiting to colleges with more than 100 individuals, and adds a fixed effect for each individual college. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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Table A.24: Summary Statistics of ZCTAs w/ High and Low Friend Exposure to Covid-19

	Low Friend-Exposure		High Friend-Exposure	
	Mean	SD	Mean	SD
Fraction Male	0.49	0.03	0.49	0.03
Fraction White	0.74	0.23	0.72	0.21
Fraction Black	0.12	0.18	0.13	0.18
Fraction Asian	0.05	0.08	0.06	0.09
Median HH Inc.	$ 65,426.94	$ 24,643.95	$ 64,707.44	$ 28,888.12
Management, Business, Science, Arts	0.17	0.08	0.18	0.08
Service Occupations	0.08	0.02	0.08	0.03
Production + Transportation	0.07	0.03	0.06	0.03
Fraction Age <18	0.23	0.05	0.22	0.05
Fraction Age 18-24	0.09	0.03	0.10	0.07
Fraction Age 25-34	0.14	0.04	0.14	0.05
Fraction Age 35-44	0.13	0.02	0.13	0.02
Fraction Age 45-54	0.14	0.02	0.13	0.02
Fraction Age 55-64	0.13	0.03	0.13	0.03
Fraction Age 65-74	0.09	0.03	0.09	0.03
Fraction Age >= 75	0.06	0.03	0.07	0.03
Fraction High School / GED	0.20	0.07	0.17	0.07
Fraction Some College	0.20	0.05	0.19	0.05
Fraction College Degree	0.19	0.11	0.23	0.13
Population Density	1606.18	4122.47	1531.22	3490.46
Fraction High-Speed Internet	0.80	0.11	0.80	0.11
Population	30175.11	21494.91	32923.65	20223.35
Mean Number of POIs	435.91	372.63	538.79	376.61
Number of ZCTAs	14079		11880	

Note: Table presents ZCTA-level summary statistics for the sample used in Section 4. Definitions of high- and low-exposure areas are based on friend exposure to Covid-19 as defined in equation A.5. High-exposure ZCTAs are ZCTAs with friend exposure to Covid-19 above the median for corresponding county. Similarly, low-exposure ZCTAs are places with friend exposure below that median. Medians are defined based on the number of Covid-19 cases as of March 15. Data on covariates is obtained from the 2014-2018 ACS data. Statistics shown are weighted by population size.

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Table A.25: Posts Regular Expression Classification

Neutral Lockdown		
%corona%	%covid%	%pandemic%
%sars%	%#socialdistancing%	%lockdown%
%stay at home%		
Pro Lockdown		
%#staysafe%	%#stayhome%	%#bendthecurve%
%bend the curve%	%#flattenthecurve%	%flatten the curve%
%#crushthecurve%	%crush the curve%	%#safeathome%
Anti Lockdown		
%#liberate%	%#endtheshutdown%	%#endthelockdown%
%#reopen%	%#openamerica%	%#stoptheshutdown%
%#stopthelockdown%	%against%quarantine%	%end the lockdown%
%end the shutdown%	%open now%	%hysteria%
%open the states%	%openthestates%	%lockdown%dictator%
%lockdown%oppress%	%lockdown%tyranny%	%lockdown%liberty%
%lockdown%freedom%	%shutdown%dictator%	%shutdown%oppress%
%shutdown%tyranny%	%shutdown%liberty%	%shutdown%freedom%
%dictator%lockdown%	%oppress%lockdown%	%tyranny%lockdown%
%liberty%lockdown%	%freedom%lockdown%	%dictator%shutdown%
%oppress%shutdown%	%tyranny%shutdown%	%liberty%shutdown%
%freedom%shutdown%		

Note: Table presents the regular expressions used to flag posts about Covid-19. % is a wild-card capturing any number of characters (including 0).

Table A.26: Reweighted Movement Sample Summary

	N	Avg. Age	% Female	% College	Avg. ZCTA Income	% iPhone	% Has Tablet	Avg. Friends
Movement Sample	12,991,476	43.6	0.53	0.53	$58,736	0.24	0.53	532
Full Sample	119,468,019	42.0	0.57	0.59	$63,791	0.61	0.43	503
Reweighted Movement Sample	12,991,476	42.0	0.57	0.59	$63,296	0.61	0.43	507

Note: Table shows summary statistics about three groups of users considered in the analyses in this paper. In the first row is the movement sample, consisting of all the users that at some point have Location History enabled, allowing us to observe their movement patterns. This sample is constructed as described in Section 1.1. The sample in the second row includes all those used in the groups analyses in Section 3.2.2, a broader sample that does not restrict to users with Location History enabled. In the third row, we present (weighted) summary statistics, after we apply the observation weights used in the regressions presented in Table A.27. These weights are calculated using a raking methodology, attempting to equalize the average age, gender balance, college attendance, ZCTA income, iPhone share, tablet share, and average number of friends across the two samples.

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Table A.27: Effects of Friend Exposure on Proba. of Staying Home, Reweighted Sample

	Monthly Change in Prob. Stay at Home					
	All months	March	April	May	June	July
Change Friend Exposure, Same Month	0.255***					
	(0.040)					
Change Friend Exposure, March		0.228***	0.008	-0.110*	0.127*	0.038
		(0.062)	(0.056)	(0.065)	(0.072)	(0.084)
Change Friend Exposure, April			0.116	0.099	0.346***	0.006
			(0.071)	(0.076)	(0.080)	(0.091)
Change Friend Exposure, May				0.473***	0.109	-0.118
				(0.110)	(0.105)	(0.121)
Change Friend Exposure, June					0.942***	-0.254
					(0.153)	(0.161)
Change Friend Exposure, July						0.210
						(0.181)
Weighted to Match Full Sample	Y	Y	Y	Y	Y	Y
Other Network Exposure FE	Y x Month	Y	Y	Y	Y	Y
Zip Code x Age Group x Gender x Has College x Has Tablet x Has iPhone	Y x Month	Y	Y	Y	Y	Y
R-Squared	0.272	0.230	0.198	0.209	0.205	0.203
Sample Mean	1.881	15.124	-1.052	-6.091	-1.055	0.698
N	30,742,008	6,688,448	6,579,359	6,169,176	5,848,722	5,456,303

Note: This table presents the results found in Table 2, applying sample weights to make the observable features of the movement sample resemble those of the larger sample used in the groups analyses. This reweighted sample is summarized in Table A.26. Standard errors are clustered by ZCTA. Significance levels: *(p<0.10), **(p<0.05), ***(p<0.01).

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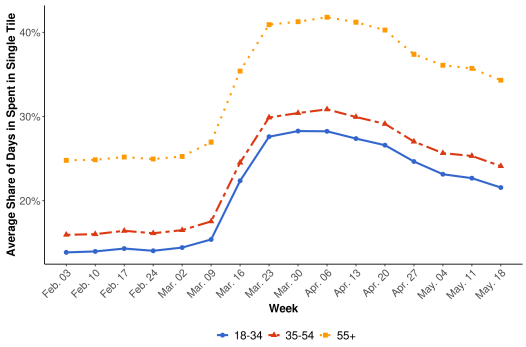
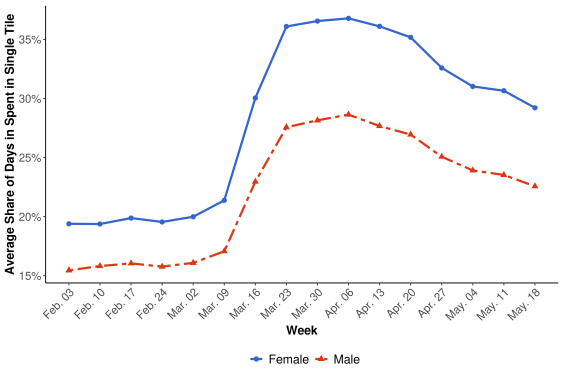
A.5 Additional Figures

Figure A.1: Heterogeneity in Probability of Staying at Home

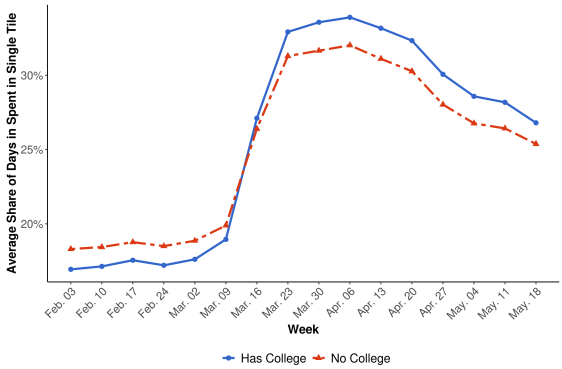
(a) Age



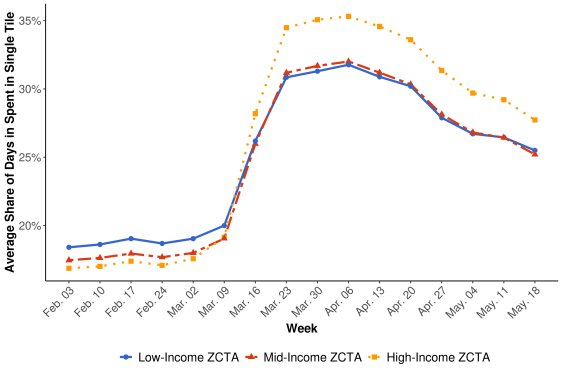
(b) Gender



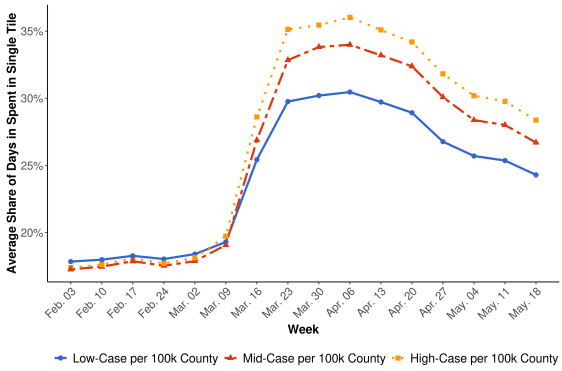
(c) Educational Attainment



(d) Income



(e) Local Exposure to Covid-19



Note: Figures show weekly averages of the probability of staying at home from the week of February 3rd to the week of May 18th across certain characteristics. Panel (a) shows age; panel (b) shows gender; panel (c) shows whether the user has a college listed on Facebook; panel (d) shows the tertile of home ZCTA median household income; and panel (e) shows the tertile of county-level cases per resident as of March 15th.

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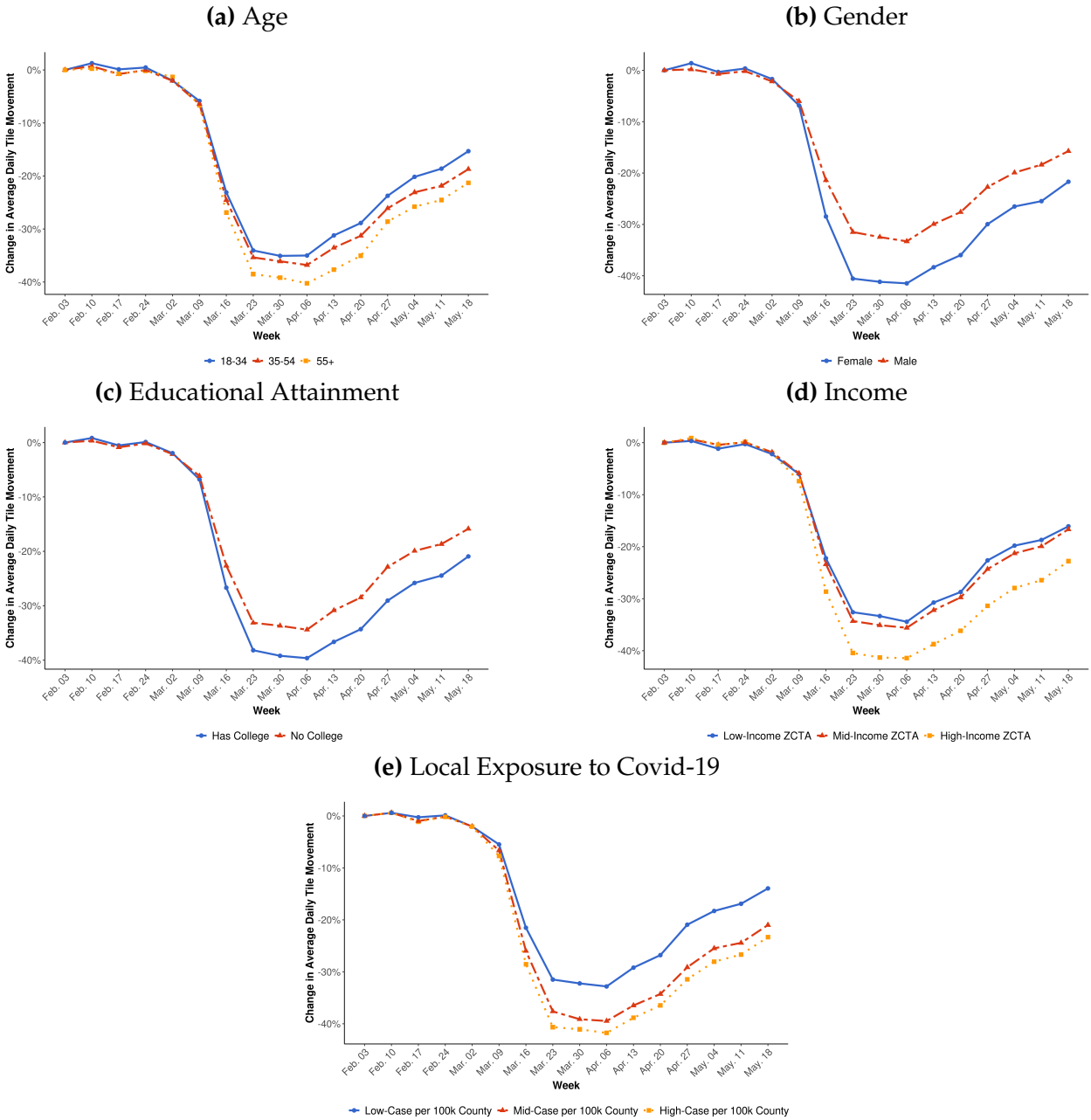
Figure A.2: Heterogeneity in Change in Average Tiles Visited



Note: Figures show the percent change in the weekly average of daily tiles visited from the week of February 3rd to the week of May 18th across certain characteristics. Panel (a) shows age; panel (b) shows gender; panel (c) shows whether the individual has college information in Facebook; panel (d) shows the tercile of ZCTA-level median household income; and panel (e) shows the tercile of county-level cases per resident as of March 15th.

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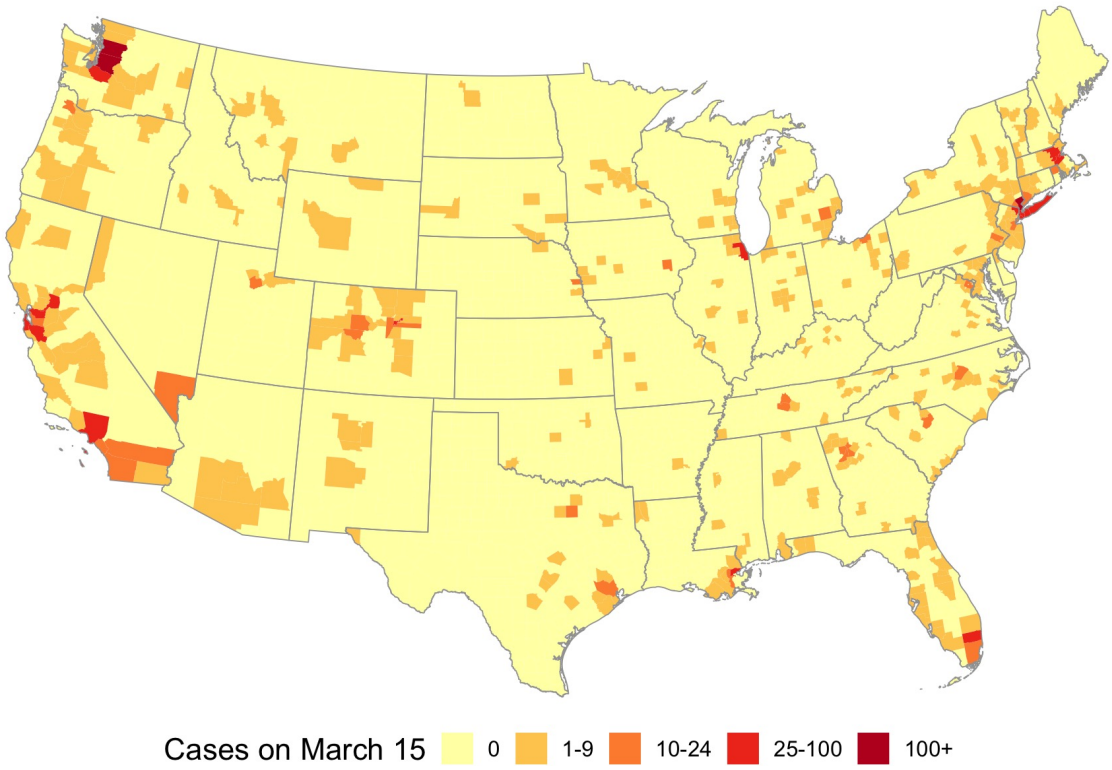
Figure A.3: Covid-19 Cases as of March 15, 2020



Note: Figure shows the cumulative number of reported Covid-19 cases by county as of March 15, 2020. Darker red colors correspond to higher Covid-19 prevalence.

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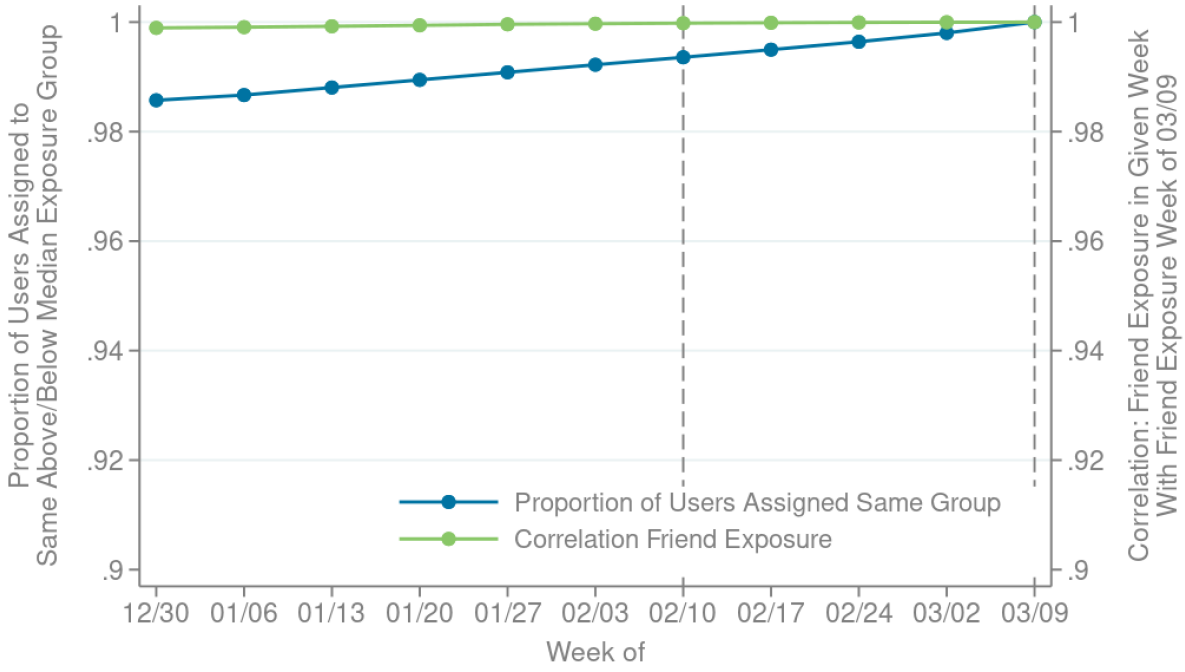
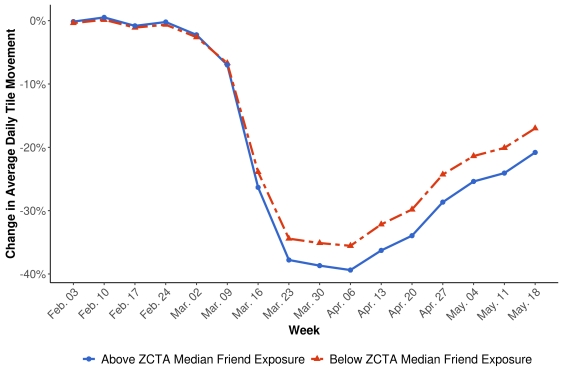
Figure A.4: Network Evolution Robustness



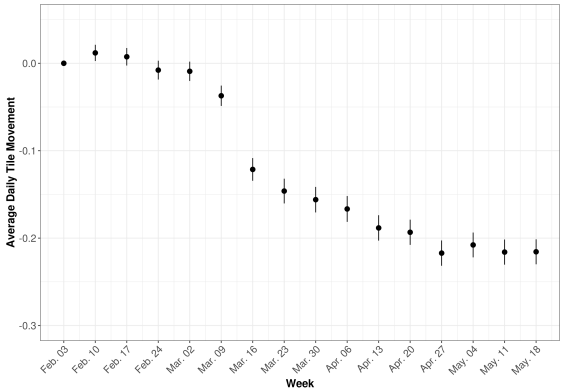
Note: This figure presents two figures illustrating the insensitivity of our measures of friend exposure to changes in users' social networks over time in our baseline sample. The green line correlates users' realized friend exposure to Covid-19 (constructed using Equation 1) on March 15 with the exposure that they would have had on March 15 had their network then been the same as it had been in each week since the start of the year. The blue line captures the fraction of users that would have been assigned to the same high- or low-exposure group in Equation 2, had friendship networks been frozen at a given date in the past. These two series indicate that patterns of exposure among individuals' networks have remained largely unchanged since the discovery of Covid-19.

Figure A.5: Effects of Friend Exposure to Covid-19 on Mobility Behavior

(a) Time Series: Average Tiles Visited



(b) Diff-In-Diff: Average Tiles Visited



Note: Figures show the relationship between friend exposure to Covid-19 on March 15th cases and mobility behavior measured as the average number of tiles visited from the week of February 3rd to the week of May 18th, separately for individuals above and below the median level of friend exposure in their ZCTA. Panel (a) shows raw means, while Panel (b) shows coefficients estimated using the difference-in-differences setup specified in Equation 2. The specification includes fixed effects at the individual level as well as the following groups interacted with week: ZCTA, age group; gender; has college listed on Facebook; has iPhone; has tablet; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Standard errors are clustered by ZCTA.

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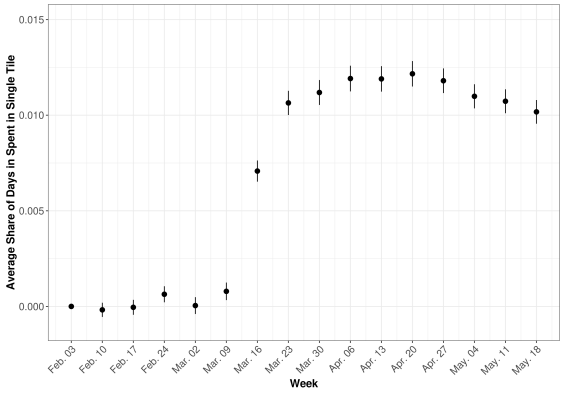
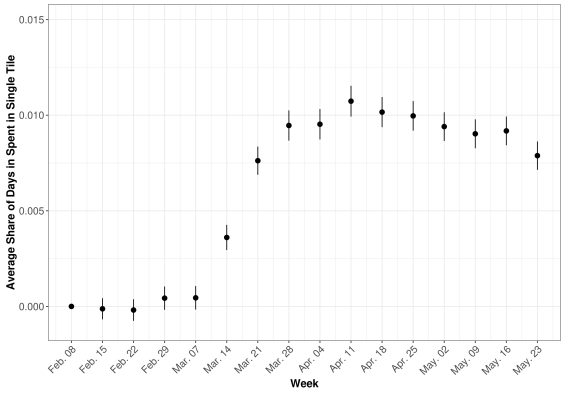
Figure A.6: Robustness: Effects of Friend Exposure to Covid-19 on Prob. of Staying Home

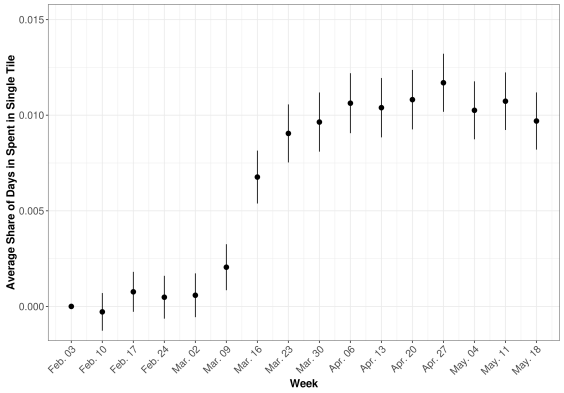
(a) Weekdays



(b) Weekends



(c) Controlling for Exact College



Note: Figures show coefficients estimated using the difference-in-differences setup specified in Equation 2 with the outcome variable as the probability of staying at home. The outcome is measured on weekdays in panel (a) and weekends in panel (b). Panel (c) limits to individuals that attended college, limiting to colleges with more than 100 individuals, and adds a fixed effect for each individual college interacted with week. All specifications include fixed effects at the individual level as well as the following groups interacted with week: ZCTA; age group; gender; has college information in Facebook; has iPhone; has tablet; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Standard errors are clustered by ZCTA.

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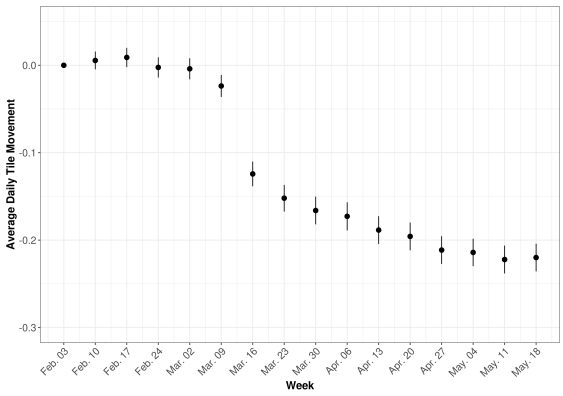
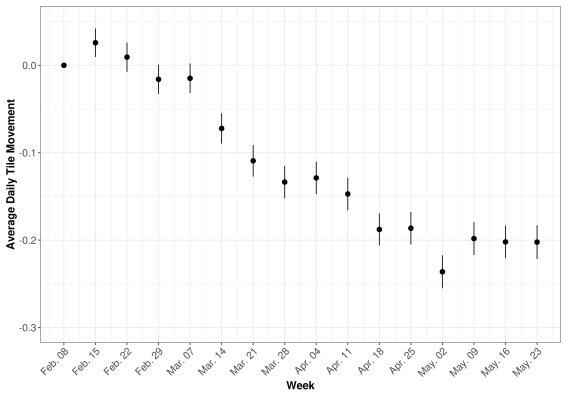
Figure A.7: Robustness: Effects of Friend Exposure to Covid-19 on Daily Tiles Visited

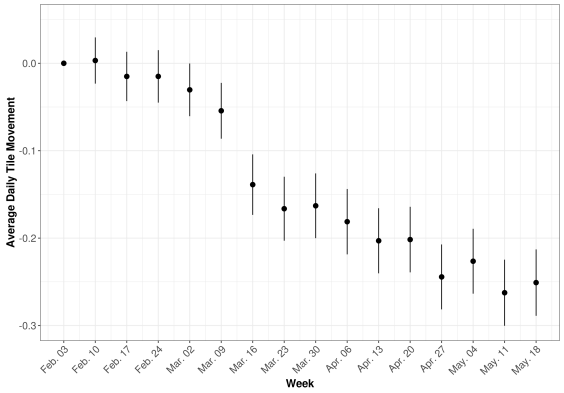
(a) Weekdays



(b) Weekends



(c) Controlling for Exact College



Note: Figures show coefficients estimated using the difference-in-differences setup specified in Equation 2 with the outcome variable as the average number of Bing tiles visited. The outcome is measured on weekdays in panel (a) and weekends in panel (b). Panel (c) limits to individuals that attended college, limiting to colleges with more than 100 individuals, and adds a fixed effect for each individual college interacted with week. All specifications include fixed effects at the individual level as well as the following groups interacted with week: ZCTA; age group; gender; has college information in Facebook; has iPhone; has tablet; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Standard errors are clustered by ZCTA.

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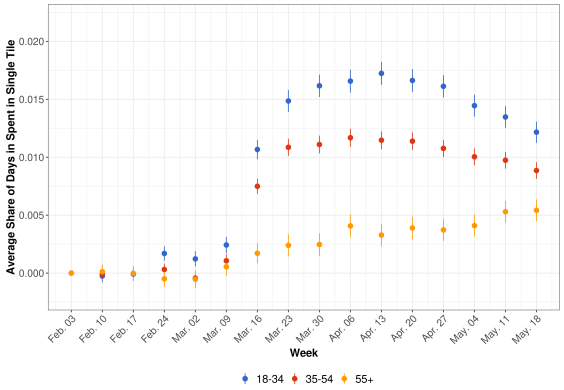
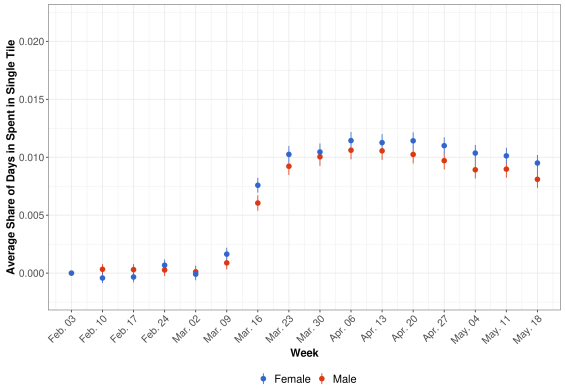
Figure A.8: Heterogeneity of Friend Effect: Probability of Staying at Home

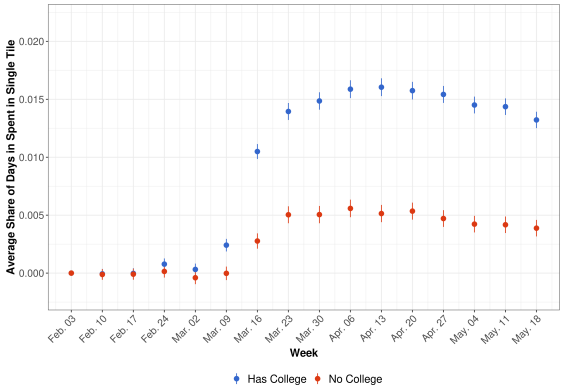
(a) Age



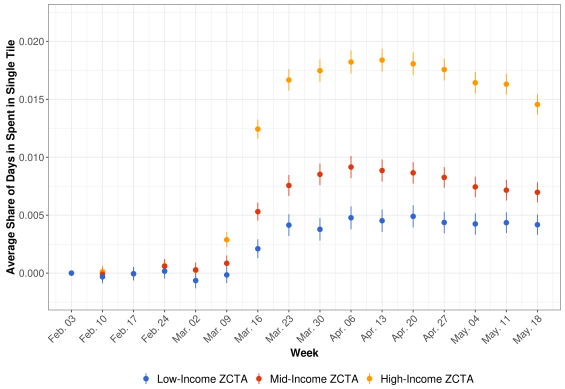
(b) Gender



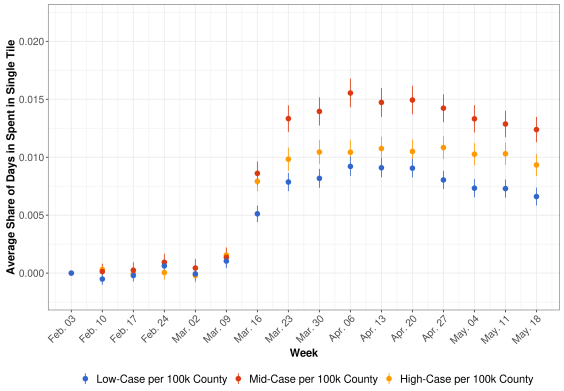
(c) Educational Attainment



(d) Income



(e) Local Exposure to Covid-19



Note: Figures show coefficients estimated using versions of the difference-in-differences described in Equation 2 with the outcome variable as the probability of staying at home. The heterogeneities interacted with exposure are: age in panel (a), gender in panel (b), whether the individual has a college listed on Facebook in panel (c); the tertile of home ZCTA median household income in panel (d); and the tertile of home county cases per resident as of March 15th in panel (e). All specifications include fixed effects at the individual level as well as the following groups interacted with week: ZCTA; age group; gender; has college; has iPhone; has tablet; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Standard errors are clustered by ZCTA.

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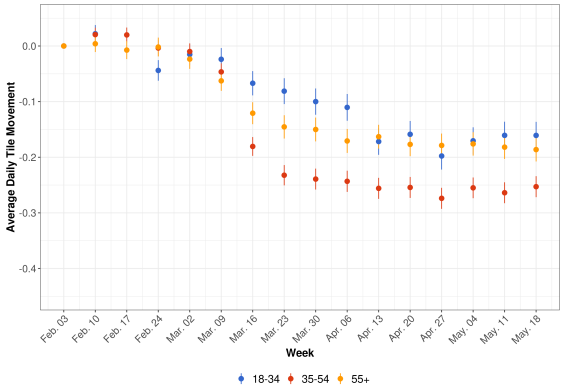
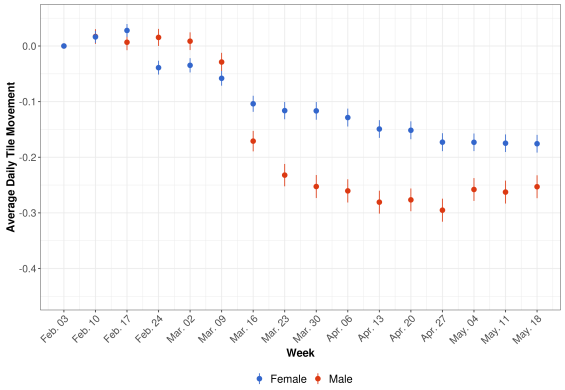
Figure A.9: Heterogeneity of Friend Effect: Average Daily Tiles Visited

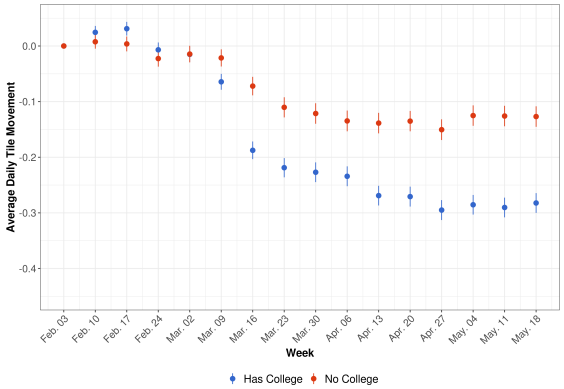
(a) Age



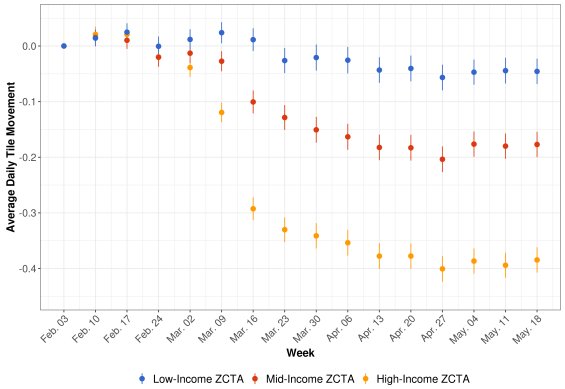
(b) Gender



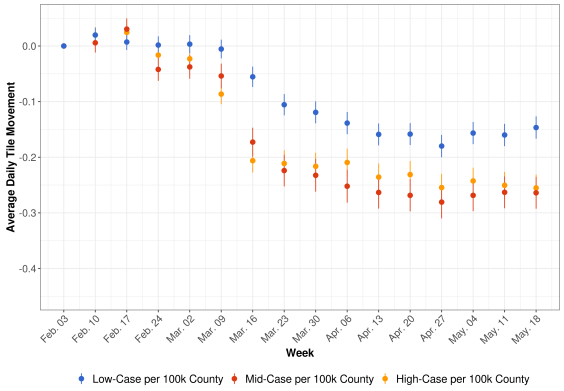
(c) Educational Attainment



(d) Income



(e) Local Exposure to Covid-19



Note: Figures show coefficients estimated using versions of the difference-in-differences described in Equation 2 with the outcome variable as the average daily tiles visited. The heterogeneities interacted with exposure are: age in panel (a), gender in panel (b), whether the individual has a college listed on Facebook in panel (c); the tertile of home ZCTA median household income in panel (d); and the tertile of home county cases per resident as of March 15th in panel (e). All specifications include fixed effects at the individual level as well as the following groups interacted with week: ZCTA; age group; gender; has college; has iPhone; has tablet; and percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Standard errors are clustered by ZCTA.

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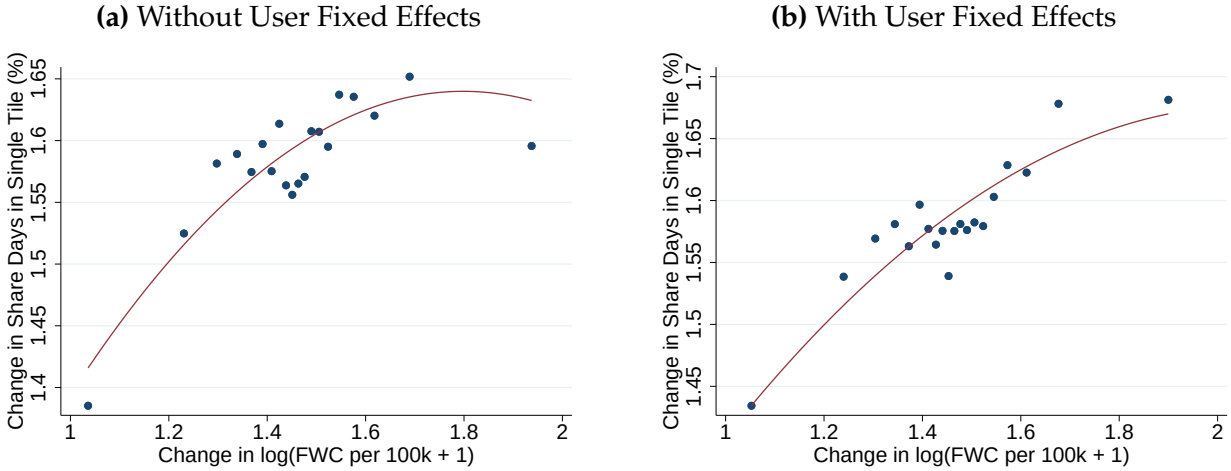
Figure A.10: Δ Probability of Staying at Home vs. Δ Friend Exposure to Covid-19



Note: Figure shows a binned scatter of the change in log friend exposure to Covid-19 cases per 100k residents and the change in the probability of staying home. The underlying regressions are equation 5. Panel (a) corresponds to the first column of Table 2. Panel (b) adds user fixed effects. Each observation is a unique individual and month for the months of March, April, May, June and July. Change in exposure is measured as of the last Friday of each month. Change in movement patterns is measured using the Tuesday to Monday week that includes each of these Fridays. Panel (a) includes fixed effects constructed by interacting dummies for the user's month, ZCTA, age group, gender, college background, and iPhone and tablet ownership. It also controls for month interacted with percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas. Panel (b) includes the same controls and also adds user fixed effects.

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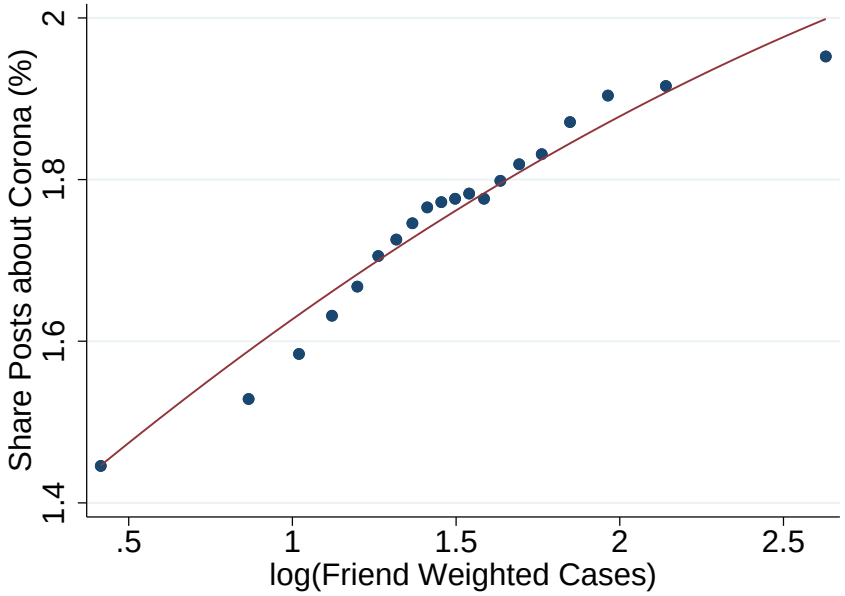
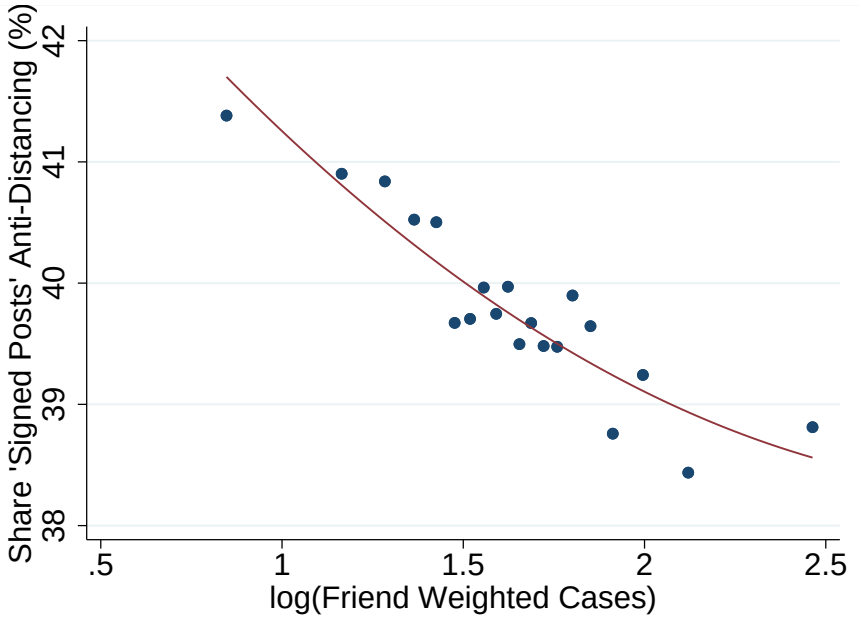
Figure A.11: Posting Behavior vs. Friend Exposure to Covid-19

(a) Share of Posts About Covid-19



(b) Share of Signed Posts Opposing Distancing



Note: Figures show binned scatter plots of the log of friend exposure to Covid-19 on March 15th and Facebook post based measures. The outcome variable in panel (a) is the percentage of individual posts that are about Covid-19 and in panel (b) it is the percentage of pro- or anti-lockdown posts that are anti-distancing. Post classification is based on the regex in Appendix A.3. The plots control for fixed effects constructed from interacting dummies for one's ZCTA, age group, gender, college background, iPhone usage, and tablet usage. They also control for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas.

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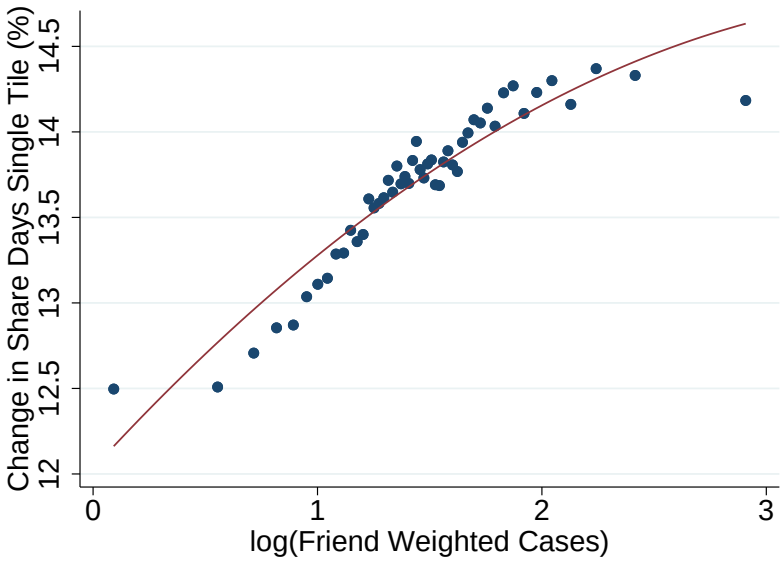
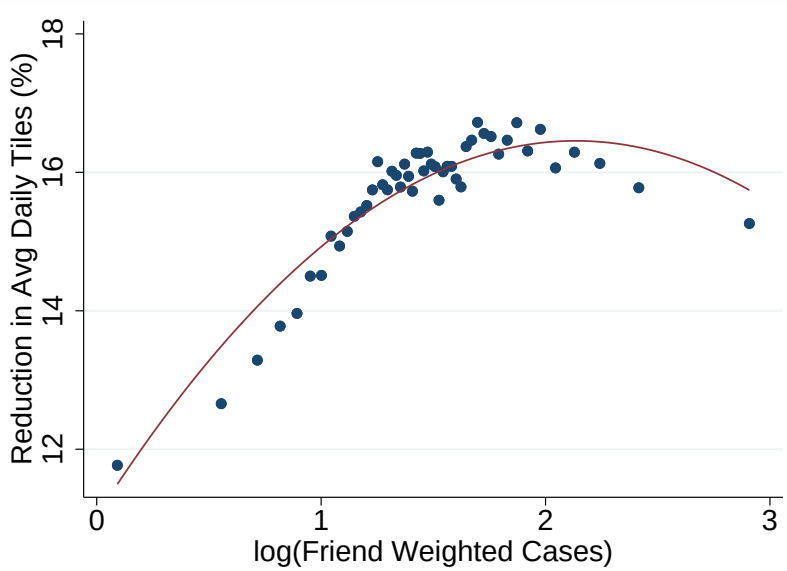
Figure A.12: Probability of Staying at Home vs. Friend Exposure to Covid-19



Note: Figure shows a binned scatter plot of the log of friend weighted friend exposure to Covid-19 on March 15th and the change in probability of staying at home from the week of February 25-March 2, 2020 (prior to the pandemic) to April 14-20, 2020. The plot controls for fixed effects constructed from interacting the user's ZCTA, age group, gender, has a college listed on Facebook, and iPhone and tablet ownership. It also controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas.

Figure A.13: Percent Reduction in Average Number of Tiles Visited vs. Friend Exposure



Note: Figure shows a binned scatter plot of the log of friend weighted friend exposure to Covid-19 on March 15th and the percent reduction in average number of tiles visited from the week of February 25th to March 2nd (prior to the pandemic) to April 14th to 20th. The plot controls for fixed effects constructed from interacting the user's ZCTA, age group, gender, has college information in Facebook, and iPhone and tablet ownership. It also controls for percentiles of friend exposures (as described in equation 3) for median household income, population density and the share of the population living in urban areas.

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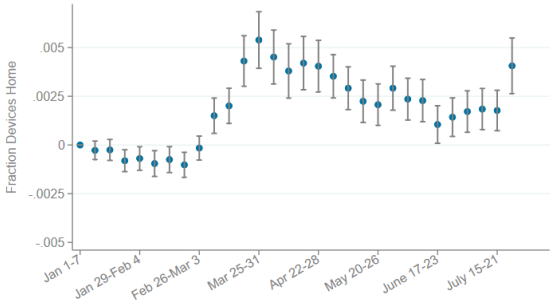
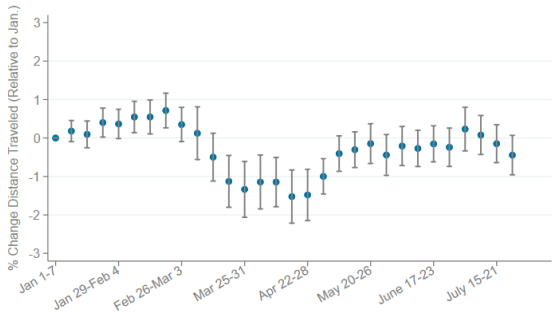
Figure A.14: Coefficient Estimates for β_t Equation A.6

(a) Fraction of Devices Home



(b) Percentage Change Avg. Distance Traveled



Note: Figures show coefficient estimates based on equation A.6. In Panel (a), the dependent variable is the fraction of devices at home, while in Panel (b), the dependent variable is the percentage change in average distance traveled relative to the month of January 2020. The unit of observation is ZCTA by week. Regressions include a rich set of controls: in addition to ZCTA fixed effects and county fixed effects interacted with week indicators, we additionally control for a rich set of covariates interacted with week indicators. These covariates are the fraction of people being male, the fraction of Asian/black/white people, median household income, the fraction of individuals working in service occupations, the fraction of individuals working in production or transportation, the fraction of individuals working in management, arts or science, the fraction of individuals with a high school degree, some college education and a college degree as well as the fraction of households with high speed internet. We also include various age-related controls, i.e. the fraction of individuals 18 or younger, between 18 and 24, between 25-34, between 35-44, between 45-54, between 55-64, between 65-74 and above 75. All these control variables are obtained from the most recent 5-year ACS (2014-2018). In addition, we also control for ventiles of friend exposure to other characteristics, namely income, population density (both from 2014-2018 ACS) and urbanity (from 2010 Census), again interacted with week indicators. Standard errors are clustered at the ZCTA-level.

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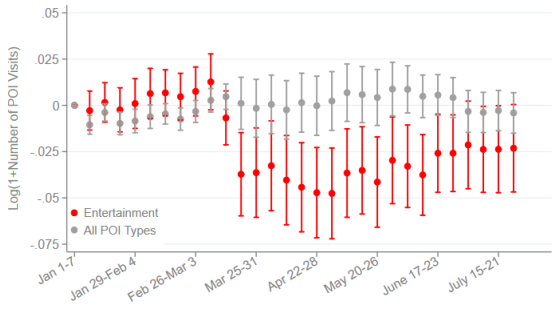
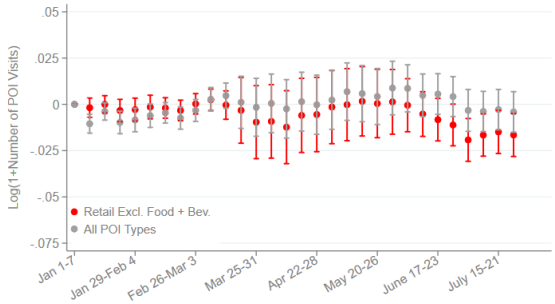
Figure A.15: Coefficient Estimates for Different Types of POI Places

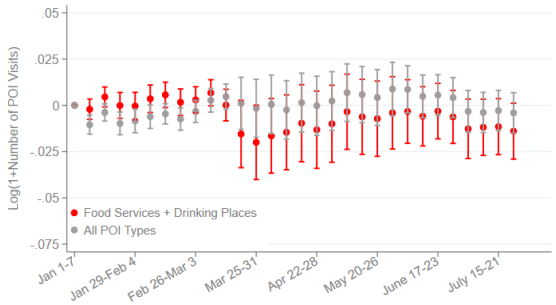
(a) Arts, Entertainment & Recreation



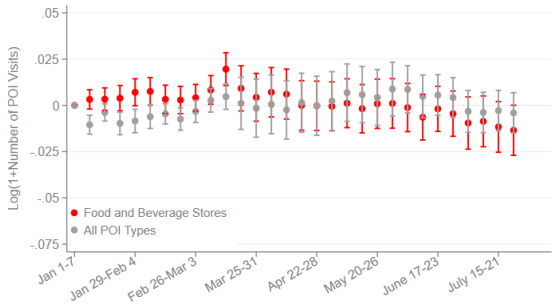
(b) Retail Trade, excl. Food & Beverage Stores



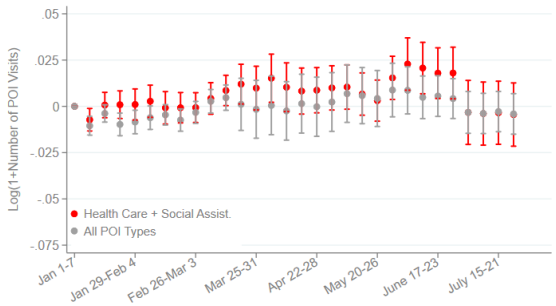
(c) Food Services & Drinking Places



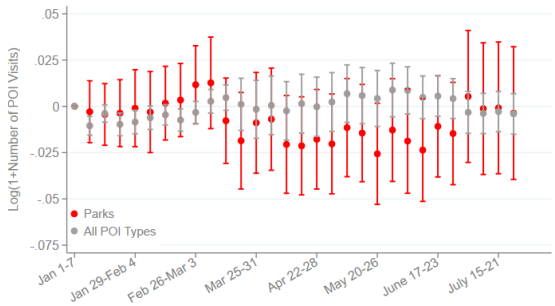
(d) Food & Beverage Stores



(e) Health Care & Social Assistance



(f) Parks



Note: Figures show coefficient estimates based on equation A.6 for various types of POIs. For reference, we include estimates aggregating across all types of POIs in gray in all panels. We control for ZCTA fixed effects, county fixed effects interacted with week indicators as well as a rich set of covariates interacted with week indicators. These covariates are the fraction of people being male, the fraction of Asian/black/white people, median household income, the fraction of individuals working in service occupations, the fraction of individuals working in production or transportation, the fraction of individuals working in management, arts or science, the fraction of individuals with a high school degree, some college education and a college degree as well as the fraction of households with high speed internet. We also include various age-related controls, i.e. the fraction of individuals 18 or younger, between 18 and 24, between 25-34, between 35-44, between 45-54, between 55-64, between 65-74 and above 75. All these control variables are obtained from the most recent 5-year ACS (2014-2018). In addition, we also control for ventiles of friend exposure to other characteristics, namely income, population density (both from 2014-2018 ACS) and urbanity (from 2010 Census), again interacted with week indicators. Standard errors are clustered at the ZCTA level.

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