
Supplementary information

**The effects of remote work on collaboration
among information workers**

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Supplementary Materials

The Effects of Remote Work on Collaboration Among Information Workers

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Regression tables

Supplementary Tables 1 through 3 show the estimates and standard errors depicted graphically in Figures 3 and 5.

	Number of				% time with ties that are			
	Ties	Groups	Cross-group Ties	Bridging Ties	Indiv. clust. coeff.	Cross-group	Bridging	Weak
Ego switch to remote (δ)	-0.026 [-0.041, -0.010] ($P < 0.001$)	-0.031 [-0.049, -0.014] ($P < 0.001$)	-0.020 [-0.040, 0.001] ($P = 0.062$)	-0.109 [-0.131, -0.088] ($P < 0.001$)	0.027 [0.001, 0.053] ($P = 0.039$)	-0.042 [-0.067, -0.017] ($P < 0.001$)	-0.220 [-0.268, -0.172] ($P < 0.001$)	-0.099 [-0.121, -0.077] ($P < 0.001$)
Collab. switch to remote (β)	0.018 [-0.004, 0.040] ($P = 0.110$)	-0.040 [-0.065, -0.015] ($P = 0.002$)	-0.020 [-0.049, 0.009] ($P = 0.185$)	0.016 [-0.017, 0.048] ($P = 0.340$)	0.030 [-0.016, 0.075] ($P = 0.201$)	-0.219 [-0.256, -0.183] ($P < 0.001$)	-0.188 [-0.264, -0.112] ($P < 0.001$)	-0.221 [-0.256, -0.187] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.008 [-0.029, 0.013] ($P = 0.476$)	-0.071 [-0.095, -0.047] ($P < 0.001$)	-0.039 [-0.068, -0.010] ($P = 0.008$)	-0.094 [-0.125, -0.062] ($P < 0.001$)	0.057 [0.017, 0.097] ($P = 0.005$)	-0.261 [-0.294, -0.229] ($P < 0.001$)	-0.408 [-0.468, -0.347] ($P < 0.001$)	-0.320 [-0.350, -0.291] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.911	0.913	0.910	0.862	0.801	0.820	0.637	0.582
R^2 (w/o FE)	0.000	0.001	0.000	0.003	0.001	0.010	0.010	0.016
N	61,182	61,182	61,182	61,182	61,182	61,182	61,182	61,182

Supplementary Table 1: **Effects of remote work on collaboration networks (part 1)**. These are coefficients from regressions based on Equation (1). The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	0.015 [-0.012, 0.041] ($P = 0.276$)	-0.045 [-0.067, -0.023] ($P < 0.001$)	-0.100 [-0.137, -0.064] ($P < 0.001$)	-0.033 [-0.041, -0.025] ($P < 0.001$)	0.137 [0.079, 0.195] ($P < 0.001$)
Collab. switch to remote (β)	-0.067 [-0.105, -0.030] ($P < 0.001$)	0.008 [-0.025, 0.040] ($P = 0.642$)	-0.187 [-0.246, -0.128] ($P < 0.001$)	-0.037 [-0.049, -0.025] ($P < 0.001$)	0.217 [0.111, 0.322] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.053 [-0.090, -0.015] ($P = 0.006$)	-0.037 [-0.068, -0.006] ($P = 0.018$)	-0.287 [-0.340, -0.235] ($P < 0.001$)	-0.070 [-0.080, -0.059] ($P < 0.001$)	0.354 [0.260, 0.447] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.792	0.789	0.536	0.875	0.691
R^2 (w/o FE)	0.000	0.000	0.005	0.009	0.004
N	61,182	61,182	61,182	61,182	61,182

Supplementary Table 2: **Effects of remote work on collaboration networks (part 2)**. These are coefficients from regressions based on Equation (1). The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	0.718 [0.609, 0.828] ($P < 0.001$)	0.009 [-0.010, 0.029] ($P = 0.349$)	0.053 [0.032, 0.074] ($P < 0.001$)	0.244 [0.206, 0.282] ($P < 0.001$)	0.018 [-0.011, 0.047] ($P = 0.234$)	0.009 [0.000, 0.018] ($P = 0.039$)
Collab. switch to remote (β)	0.918 [0.737, 1.098] ($P < 0.001$)	-0.167 [-0.199, -0.135] ($P < 0.001$)	-0.100 [-0.133, -0.066] ($P < 0.001$)	0.263 [0.209, 0.316] ($P < 0.001$)	0.066 [0.023, 0.110] ($P = 0.003$)	0.088 [0.074, 0.102] ($P < 0.001$)
Total effect ($\delta + \beta$)	1.636 [1.465, 1.807] ($P < 0.001$)	-0.158 [-0.189, -0.126] ($P < 0.001$)	-0.047 [-0.080, -0.014] ($P = 0.006$)	0.507 [0.459, 0.554] ($P < 0.001$)	0.084 [0.049, 0.119] ($P < 0.001$)	0.098 [0.085, 0.110] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.699	0.861	0.855	0.836	0.828	0.877
R^2 (w/o FE)	0.014	0.004	0.001	0.010	0.000	0.009
N	61,182	61,182	61,182	61,182	61,182	61,182

Supplementary Table 3: **Effects of remote work on communication media.** These are coefficients from regressions based on Equation (1). The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in unscheduled calls, hours spent in scheduled meetings, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

Heterogeneous treatment effects – Manager/IC

Supplementary Figure 1 shows the remote work effects on whom people collaborate with broken down by manager / IC status (corresponding results are in Supplementary Tables 4 through 7). The effects on use of communication media are in the left panels of main text Figure 6 (corresponding results are in Supplementary Tables 8 and 9). To help with interpreting these results, Supplementary Table 10 shows how the baseline levels for managers and ICs compare to the average.

	Number of				% time with ties that are			
	Ties	Groups	Cross-group		Indiv. clust. coeff.	Cross-group	Bridging	Weak
			Ties	Ties				
Ego switch to remote (δ)	-0.055 ($P = 0.023$)	-0.076 [-0.135, -0.017] ($P = 0.011$)	-0.077 [-0.147, -0.006] ($P = 0.033$)	-0.204 [-0.267, -0.141] ($P < 0.001$)	0.041 [-0.001, 0.084] ($P = 0.059$)	-0.068 [-0.132, -0.005] ($P = 0.036$)	-0.218 [-0.307, -0.129] ($P < 0.001$)	-0.106 [-0.144, -0.069] ($P < 0.001$)
Collab. switch to remote (β)	0.062 [-0.013, 0.137] ($P = 0.103$)	-0.040 [-0.136, 0.056] ($P = 0.415$)	0.016 [-0.098, 0.129] ($P = 0.786$)	0.116 [0.011, 0.220] ($P = 0.031$)	-0.051 [-0.115, 0.012] ($P = 0.114$)	-0.147 [-0.238, -0.056] ($P = 0.001$)	-0.067 [-0.197, 0.062] ($P = 0.307$)	-0.234 [-0.299, -0.169] ($P < 0.001$)
Total effect ($\delta + \beta$)	0.007 [-0.056, 0.071] ($P = 0.821$)	-0.116 [-0.206, -0.026] ($P = 0.011$)	-0.061 [-0.161, 0.040] ($P = 0.235$)	-0.088 [-0.181, 0.004] ($P = 0.062$)	-0.010 [-0.062, 0.042] ($P = 0.709$)	-0.215 [-0.288, -0.143] ($P < 0.001$)	-0.285 [-0.391, -0.180] ($P < 0.001$)	-0.340 [-0.400, -0.280] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.894	0.907	0.903	0.855	0.827	0.889	0.739	0.688
R^2 (w/o FE)	0.001	0.002	0.001	0.005	0.002	0.010	0.017	0.040
N	9,715	9,715	9,715	9,715	9,715	9,715	9,715	9,715

Supplementary Table 4: **Effects of remote work on collaboration networks for managers (part 1).** These are coefficients from regressions based on Equation (1) using only employees who are managers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	0.031 [-0.065, 0.127] ($P = 0.527$)	-0.081 [-0.151, -0.012] ($P = 0.021$)	-0.095 [-0.180, -0.010] ($P = 0.029$)	-0.022 [-0.040, -0.003] ($P = 0.020$)	-0.043 [-0.148, 0.062] ($P = 0.425$)
Collab. switch to remote (β)	0.005 [-0.136, 0.146] ($P = 0.940$)	0.007 [-0.105, 0.119] ($P = 0.904$)	-0.226 [-0.355, -0.096] ($P < 0.001$)	-0.068 [-0.096, -0.039] ($P < 0.001$)	0.286 [0.126, 0.446] ($P < 0.001$)
Total effect ($\delta + \beta$)	0.036 [-0.106, 0.178] ($P = 0.616$)	-0.075 [-0.171, 0.022] ($P = 0.131$)	-0.320 [-0.418, -0.223] ($P < 0.001$)	-0.089 [-0.112, -0.066] ($P < 0.001$)	0.244 [0.120, 0.368] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.749	0.760	0.603	0.877	0.668
R^2 (w/o FE)	0.000	0.001	0.015	0.020	0.006
N	9,715	9,715	9,715	9,715	9,715

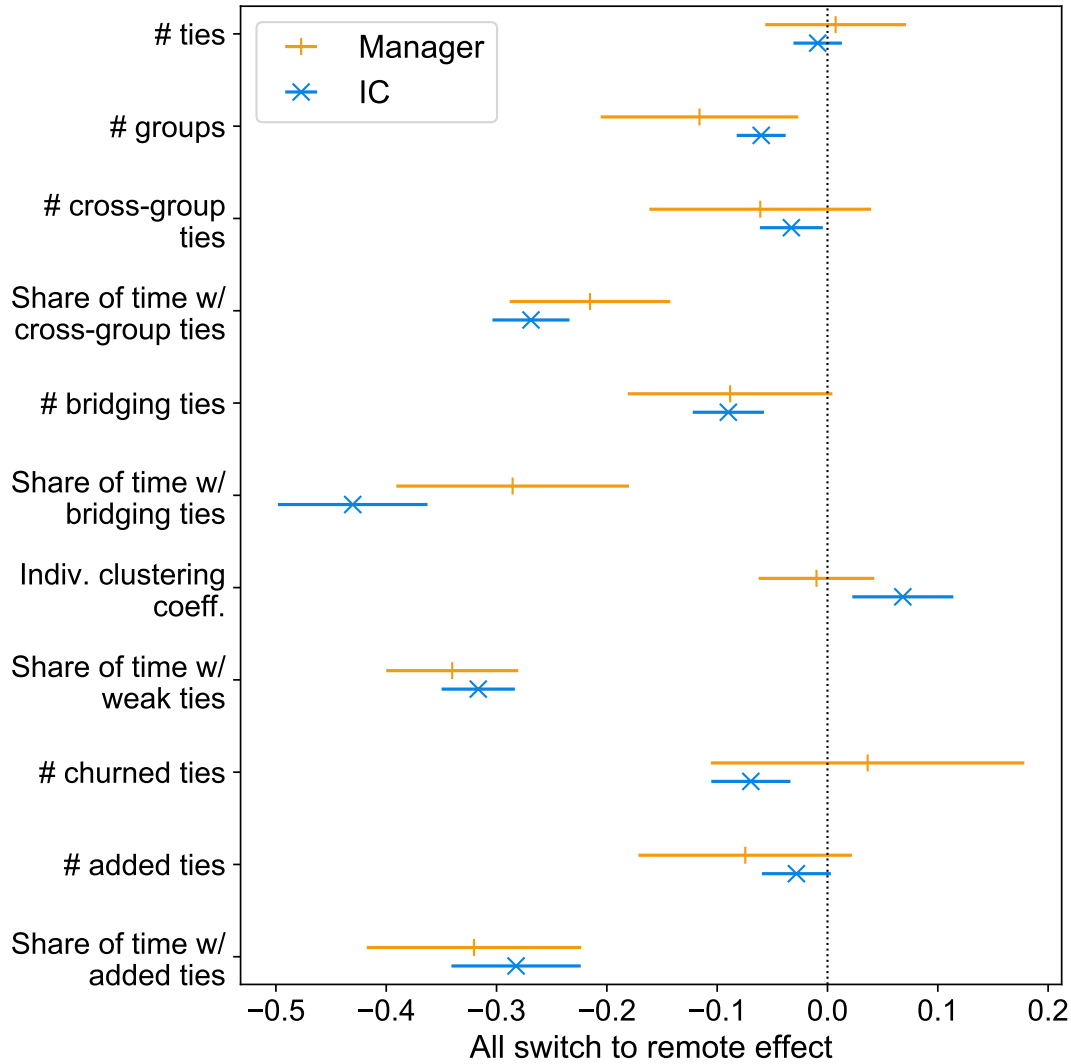
Supplementary Table 5: **Effects of remote work on collaboration networks for managers (part 2)**. These are coefficients from regressions based on Equation (1) using only employees who are managers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Number of				% time with ties that are			
	Ties	Groups	Cross-group Ties	Bridging Ties	Indiv. clust. coeff.	Cross-group	Bridging	Weak
Ego switch to remote (δ)	-0.021 ($P = 0.011$)	-0.023 [-0.040, -0.005] ($P = 0.012$)	-0.009 [-0.029, 0.012] ($P = 0.399$)	-0.092 [-0.115, -0.069] ($P < 0.001$)	0.026 [-0.004, 0.055] ($P = 0.091$)	-0.038 [-0.064, -0.011] ($P = 0.006$)	-0.222 [-0.276, -0.168] ($P < 0.001$)	-0.097 [-0.123, -0.072] ($P < 0.001$)
Collab. switch to remote (β)	0.012 [-0.014, 0.034] ($P = 0.309$)	-0.037 [-0.062, -0.013] ($P = 0.002$)	-0.024 [-0.052, 0.005] ($P = 0.101$)	0.002 [-0.030, 0.035] ($P = 0.885$)	0.043 [-0.009, 0.094] ($P = 0.104$)	-0.231 [-0.270, -0.192] ($P < 0.001$)	-0.209 [-0.293, -0.124] ($P < 0.001$)	-0.219 [-0.258, -0.181] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.009 [-0.031, 0.013] ($P = 0.427$)	-0.060 [-0.082, -0.038] ($P < 0.001$)	-0.033 [-0.061, -0.004] ($P = 0.024$)	-0.090 [-0.122, -0.058] ($P < 0.001$)	0.068 [0.023, 0.114] ($P = 0.003$)	-0.269 [-0.304, -0.234] ($P < 0.001$)	-0.430 [-0.498, -0.363] ($P < 0.001$)	-0.317 [-0.350, -0.283] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.893	0.897	0.893	0.854	0.792	0.798	0.620	0.558
R^2 (w/o FE)	0.000	0.001	0.000	0.003	0.001	0.010	0.009	0.014
N	51,467	51,467	51,467	51,467	51,467	51,467	51,467	51,467

Supplementary Table 6: **Effects of remote work on collaboration networks for individual contributors (part 1).** These are coefficients from regressions based on Equation (1) using only employees who are individual contributors (not managers). The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	0.010 [-0.015, 0.036] ($P = 0.423$)	-0.038 [-0.061, -0.015] ($P = 0.001$)	-0.101 [-0.141, -0.060] ($P < 0.001$)	-0.035 [-0.043, -0.026] ($P < 0.001$)	0.172 [0.106, 0.238] ($P < 0.001$)
Collab. switch to remote (β)	-0.080 [-0.116, -0.043] ($P < 0.001$)	0.010 [-0.023, 0.043] ($P = 0.565$)	-0.182 [-0.246, -0.117] ($P < 0.001$)	-0.032 [-0.045, -0.019] ($P < 0.001$)	0.209 [0.090, 0.328] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.069 [-0.105, -0.034] ($P < 0.001$)	-0.028 [-0.059, 0.003] ($P = 0.077$)	-0.282 [-0.341, -0.224] ($P < 0.001$)	-0.067 [-0.078, -0.055] ($P < 0.001$)	0.381 [0.273, 0.489] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.779	0.771	0.513	0.858	0.674
R^2 (w/o FE)	0.000	0.000	0.005	0.008	0.005
N	51,467	51,467	51,467	51,467	51,467

Supplementary Table 7: **Effects of remote work on collaboration networks for individual contributors (part 2)**. These are coefficients from regressions based on Equation (1) using only employees who are individual contributors (not managers). The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.



Supplementary Figure 1: **Effects of remote work on collaboration networks by Manager/IC status.** These are the causal effects, estimated separately for Managers and Individual Contributors (ICs), of both an employee and their colleagues switching to remote work on the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the share of time spent with cross-group ties, the number of bridging ties an employee has, the share of time spent with bridging ties, the individual clustering coefficient of an employee's ties, the share of time spent with weak ties, the number of churned ties, the number of added ties, and the share of time spent with added ties. They are $(\beta + \delta)$ from Equation (1), normalized by the average level in February. Symbols depict point estimates and horizontal lines depict 95% confidence intervals.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	1.027 [0.679, 1.375] ($P < 0.001$)	0.056 [-0.005, 0.118] ($P = 0.071$)	0.117 [0.052, 0.181] ($P < 0.001$)	0.320 [0.201, 0.439] ($P < 0.001$)	0.086 [-0.057, 0.229] ($P = 0.238$)	0.018 [-0.005, 0.041] ($P = 0.130$)
Collab. switch to remote (β)	1.881 [1.387, 2.376] ($P < 0.001$)	-0.234 [-0.343, -0.126] ($P < 0.001$)	-0.103 [-0.212, 0.005] ($P = 0.061$)	0.457 [0.305, 0.608] ($P < 0.001$)	0.152 [-0.036, 0.341] ($P = 0.113$)	0.071 [0.036, 0.106] ($P < 0.001$)
Total effect ($\delta + \beta$)	2.909 [2.492, 3.325] ($P < 0.001$)	-0.178 [-0.275, -0.081] ($P < 0.001$)	0.013 [-0.083, 0.109] ($P = 0.787$)	0.777 [0.651, 0.902] ($P < 0.001$)	0.239 [0.147, 0.331] ($P < 0.001$)	0.089 [0.062, 0.116] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.735	0.804	0.813	0.859	0.901	0.876
R^2 (w/o FE)	0.032	0.004	0.003	0.019	0.003	0.010
N	9,715	9,715	9,715	9,715	9,715	9,715

Supplementary Table 8: Effects of remote work on communication media for managers. These are coefficients from regressions based on Equation (1), using only employees who are managers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	0.646 [0.535, 0.757] ($P < 0.001$)	0.001 [-0.019, 0.021] ($P = 0.892$)	0.041 [0.020, 0.062] ($P < 0.001$)	0.227 [0.188, 0.266] ($P < 0.001$)	0.003 [-0.020, 0.025] ($P = 0.808$)	0.008 [-0.002, 0.018] ($P = 0.107$)
Collab. switch to remote (β)	0.740 [0.548, 0.932] ($P < 0.001$)	-0.158 [-0.190, -0.126] ($P < 0.001$)	-0.103 [-0.137, -0.069] ($P < 0.001$)	0.225 [0.169, 0.282] ($P < 0.001$)	0.051 [0.010, 0.092] ($P = 0.015$)	0.091 [0.076, 0.106] ($P < 0.001$)
Total effect ($\delta + \beta$)	1.385 [1.201, 1.570] ($P < 0.001$)	-0.157 [-0.189, -0.125] ($P < 0.001$)	-0.062 [-0.096, -0.028] ($P < 0.001$)	0.453 [0.403, 0.502] ($P < 0.001$)	0.053 [0.015, 0.091] ($P = 0.006$)	0.099 [0.085, 0.113] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.686	0.844	0.836	0.830	0.770	0.862
R^2 (w/o FE)	0.011	0.005	0.002	0.008	0.000	0.009
N	51,467	51,467	51,467	51,467	51,467	51,467

Supplementary Table 9: **Effects of remote work on communication media for individual contributors.** These are coefficients from regressions based on Equation (1), using only employees who are independent contributors (not managers). The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Manager	IC
# Ties	1.670	0.880
# Groups	1.735	0.868
# Cross-group ties	1.814	0.854
Share of time w/ cross-group ties	1.134	0.978
# Bridging ties	1.520	0.910
Share of time w/ bridging ties	0.730	1.053
Indiv. clustering coeff.	0.771	1.036
Share of time w/ weak ties	0.859	1.027
# Churned ties	1.609	0.894
# Added ties	1.573	0.897
Share of time w/ added ties	0.701	1.051
Unscheduled call hours	1.192	0.969
Scheduled meeting hours	1.477	0.913
Meeting + call hours	1.460	0.916
Instant messages sent	1.034	0.998
Emails sent	1.934	0.829
Workweek hours	1.202	0.964

Supplementary Table 10: **Relative levels of collaboration measures for Manager/IC.** This table shows the relative levels of Manager/IC's collaboration measures in February with respect to the average across all US employees. We show relative levels for each of our outcomes: the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the share of time spent with cross-group ties, the number of bridging ties an employee has, the share of time spent with bridging ties, the individual clustering coefficient of an employee's ties, the share of time spent with weak ties, the number of churned ties, the number of added ties, the share of time spent with added ties, hours spent in unscheduled calls, hours spent in scheduled meetings, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours.

Heterogeneous treatment effects – Tenure

Supplementary Figure 2 shows the remote work effects on whom people collaborate with broken down by short / long tenure at Microsoft (corresponding results are in Supplementary Tables 11 through 14). Supplementary Figure 3 shows the remote work effects on use of communication media by tenure (corresponding results are in Supplementary Tables 15 and 16). To help with interpreting these results, Supplementary Table 17 shows how the baseline levels for employees with short and long tenure compare to the average.

	Number of				% time with ties that are			
	Ties	Groups	Cross-group Ties	Bridging Ties	Indiv. clust. coeff.	Cross-group	Bridging	Weak
Ego switch to remote (δ)	-0.043 ($P = 0.019$)	-0.035 [-0.076, 0.005] ($P = 0.088$)	-0.027 [-0.070, 0.017] ($P = 0.232$)	-0.091 [-0.137, 0.046] ($P < 0.001$)	0.073 [-0.032, 0.177] ($P = 0.175$)	-0.022 [-0.100, 0.056] ($P = 0.580$)	-0.257 [-0.445, -0.068] ($P = 0.008$)	-0.056 [-0.153, -0.041] ($P = 0.256$)
Collab. switch to remote (β)	-0.008 [-0.055, 0.040] ($P = 0.758$)	-0.048 [-0.101, 0.004] ($P = 0.070$)	-0.047 [-0.104, 0.011] ($P = 0.113$)	-0.038 [-0.103, 0.028] ($P = 0.261$)	0.034 [-0.123, 0.192] ($P = 0.668$)	-0.197 [-0.300, -0.094] ($P < 0.001$)	-0.110 [-0.411, 0.190] ($P = 0.472$)	-0.186 [-0.314, -0.058] ($P = 0.004$)
Total effect ($\delta + \beta$)	-0.051 [-0.092, -0.010] ($P = 0.016$)	-0.084 [-0.128, -0.039] ($P < 0.001$)	-0.073 [-0.122, -0.025] ($P = 0.003$)	-0.129 [-0.184, -0.074] ($P < 0.001$)	0.107 [-0.020, 0.234] ($P = 0.098$)	-0.219 [-0.304, -0.133] ($P < 0.001$)	-0.367 [-0.590, -0.145] ($P = 0.001$)	-0.242 [-0.337, -0.148] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.886	0.879	0.876	0.834	0.773	0.747	0.569	0.505
R^2 (w/o FE)	0.002	0.002	0.001	0.005	0.002	0.005	0.009	0.006
N	7,865	7,865	7,865	7,865	7,865	7,865	7,865	7,865

Supplementary Table 11: **Effects of remote work on collaboration networks for employees with short tenure at Microsoft (part 1).** These are coefficients from regressions based on Equation (1) using only employees who had been at Microsoft for less than a year. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	0.021 [-0.031, 0.074] ($P = 0.427$)	-0.065 [-0.117, -0.013] ($P = 0.014$)	-0.084 [-0.221, 0.053] ($P = 0.227$)	-0.048 [-0.073, -0.024] ($P < 0.001$)	0.194 [-0.002, 0.389] ($P = 0.052$)
Collab. switch to remote (β)	-0.135 [-0.209, -0.062] ($P < 0.001$)	0.036 [-0.037, 0.110] ($P = 0.329$)	-0.068 [-0.275, 0.139] ($P = 0.519$)	-0.023 [-0.057, 0.011] ($P = 0.184$)	0.154 [-0.144, 0.451] ($P = 0.312$)
Total effect ($\delta + \beta$)	-0.114 [-0.181, -0.048] ($P < 0.001$)	-0.029 [-0.089, 0.032] ($P = 0.353$)	-0.152 [-0.331, 0.026] ($P = 0.095$)	-0.071 [-0.099, -0.044] ($P < 0.001$)	0.347 [0.090, 0.604] ($P = 0.008$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.771	0.754	0.507	0.846	0.674
R^2 (w/o FE)	0.002	0.001	0.001	0.011	0.004
N	7,865	7,865	7,865	7,865	7,865

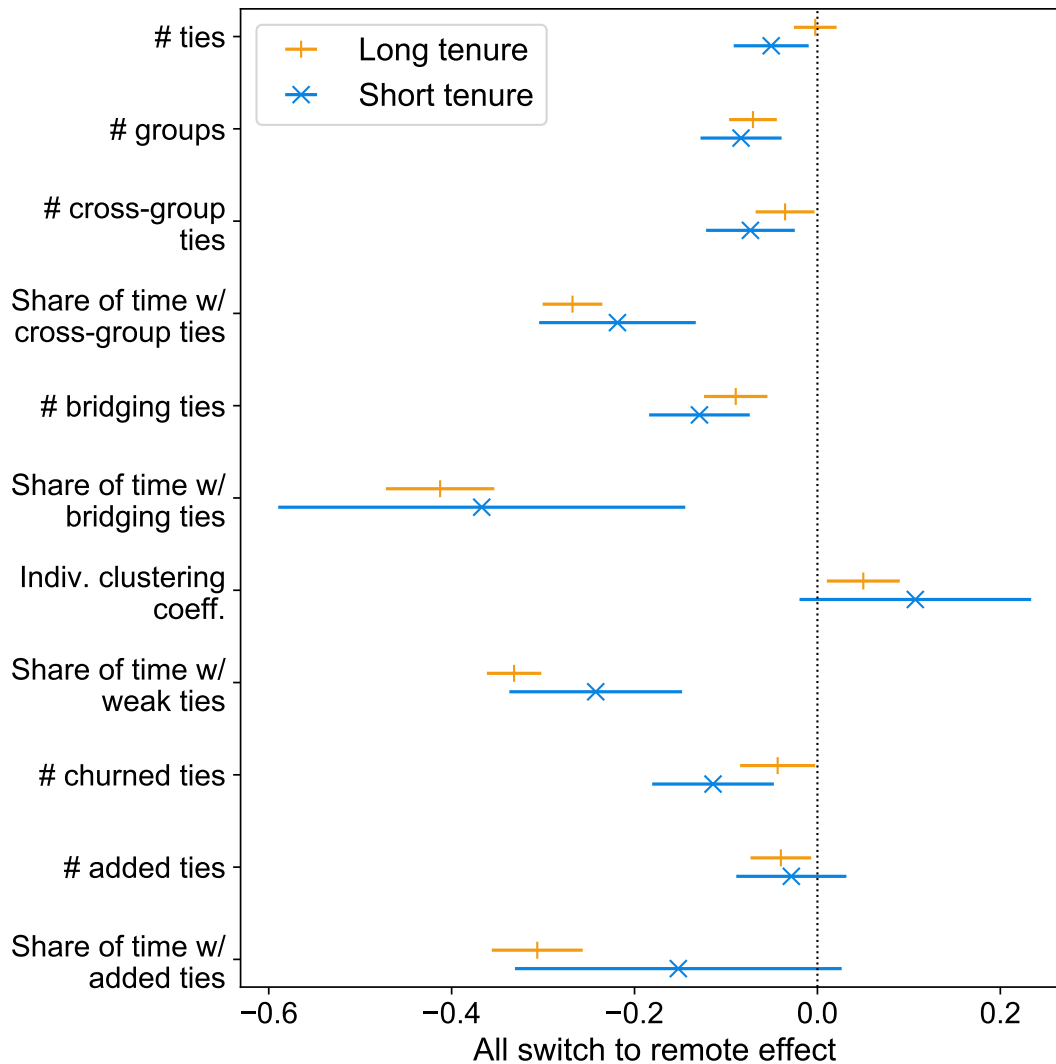
Supplementary Table 12: **Effects of remote work on collaboration networks for employees with short tenure at Microsoft (part 2)**. These are coefficients from regressions based on Equation (1) using only employees who had been at Microsoft for less than a year. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Number of				% time with ties that are			
	Ties	Groups	Cross-group Ties	Bridging Ties	Indiv. clust. coeff.	Cross-group	Bridging	Weak
Ego switch to remote (δ)	-0.023 ($P = 0.007$)	-0.030 [-0.049, -0.011] ($P = 0.002$)	-0.018 [-0.040, 0.004] ($P = 0.113$)	-0.112 [-0.136, -0.088] ($P < 0.001$)	0.020 [0.005, 0.044] ($P = 0.110$)	-0.045 [-0.070, -0.020] ($P < 0.001$)	-0.215 [-0.259, -0.170] ($P < 0.001$)	-0.105 [-0.127, -0.084] ($P < 0.001$)
Collab. switch to remote (β)	0.020 [-0.004, 0.044] ($P = 0.098$)	-0.040 [-0.068, -0.013] ($P = 0.004$)	-0.017 [-0.049, 0.015] ($P = 0.291$)	0.022 [-0.013, 0.058] ($P = 0.211$)	0.030 [0.014, 0.074] ($P = 0.180$)	-0.223 [-0.260, -0.186] ($P < 0.001$)	-0.198 [-0.268, -0.128] ($P < 0.001$)	-0.226 [-0.260, -0.193] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.002 [-0.026, 0.021] ($P = 0.841$)	-0.070 [-0.097, -0.044] ($P < 0.001$)	-0.035 [-0.068, -0.003] ($P = 0.031$)	-0.089 [-0.124, -0.055] ($P < 0.001$)	0.050 [0.010, 0.090] ($P = 0.014$)	-0.268 [-0.300, -0.235] ($P < 0.001$)	-0.413 [-0.472, -0.353] ($P < 0.001$)	-0.332 [-0.361, -0.302] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.910	0.913	0.909	0.860	0.800	0.828	0.646	0.596
R^2 (w/o FE)	0.000	0.001	0.000	0.003	0.000	0.011	0.010	0.018
N	53,317	53,317	53,317	53,317	53,317	53,317	53,317	53,317

Supplementary Table 13: Effects of remote work on collaboration networks for employees with long tenure at Microsoft (part 1). These are coefficients from regressions based on Equation (1) using only employees who had been at Microsoft for more than a year. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	0.014 [-0.016, 0.043] ($P = 0.362$)	-0.041 [-0.065, -0.018] ($P < 0.001$)	-0.103 [-0.140, -0.066] ($P < 0.001$)	-0.030 [-0.038, -0.022] ($P < 0.001$)	0.128 [0.069, 0.187] ($P < 0.001$)
Collab. switch to remote (β)	-0.057 [-0.097, -0.017] ($P = 0.006$)	0.001 [-0.034, 0.036] ($P = 0.949$)	-0.203 [-0.260, -0.146] ($P < 0.001$)	-0.041 [-0.053, -0.028] ($P < 0.001$)	0.228 [0.123, 0.334] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.043 [-0.085, -0.002] ($P = 0.038$)	-0.040 [-0.073, -0.007] ($P = 0.018$)	-0.306 [-0.356, -0.257] ($P < 0.001$)	-0.071 [-0.082, -0.060] ($P < 0.001$)	0.356 [0.262, 0.450] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.787	0.786	0.542	0.874	0.688
R^2 (w/o FE)	0.000	0.000	0.006	0.009	0.004
N	53,317	53,317	53,317	53,317	53,317

Supplementary Table 14: **Effects of remote work on collaboration networks for employees with long tenure at Microsoft (part 2).** These are coefficients from regressions based on Equation (1) using only employees who had been at Microsoft for more than a year. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.



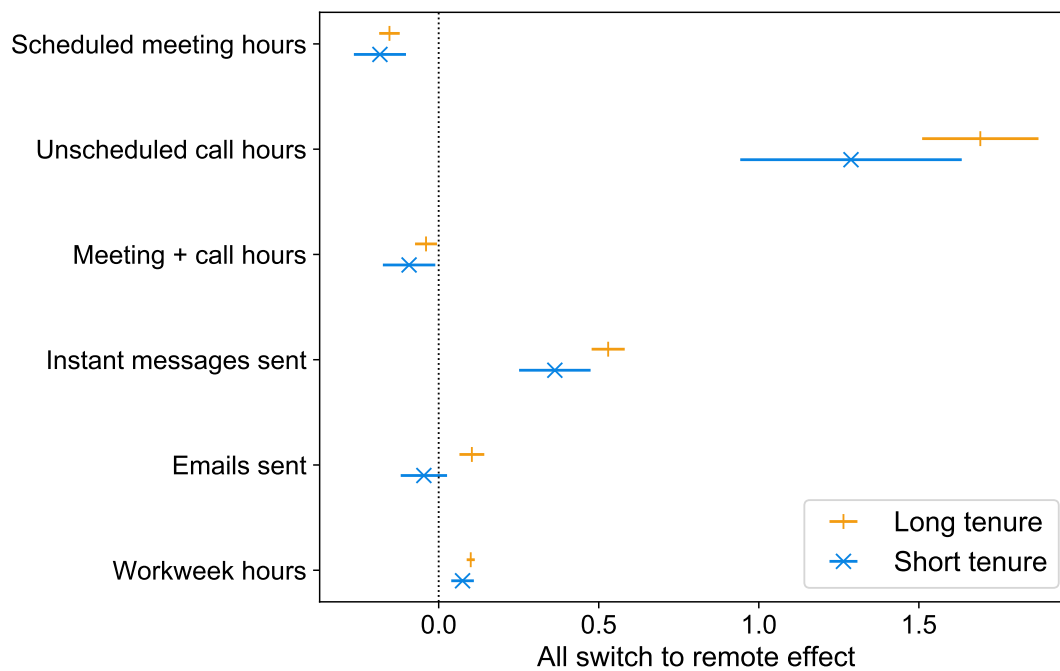
Supplementary Figure 2: **Effects of remote work on collaboration networks by tenure at Microsoft.** These are the causal effects, estimated separately for people who had been in Microsoft for less/more than a year as of February 2020, of both an employee and their colleagues switching to remote work on the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the entropy of the distribution of time spent collaborating with each of their collaborators, the number of collaborators in the previous month that they no longer collaborate with, the number of current collaborators they did not collaborate with the previous month, and the share of time spent with collaborators they did not (new) and did (old) collaborate with the previous month. They are $(\beta + \delta)$ from Equation (1), normalized by the average level in February. Symbols depict point estimates and lines depict 95% confidence intervals.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	0.743 [0.627, 0.859] ($P < 0.001$)	0.015 [-0.006, 0.035] ($P = 0.169$)	0.060 [0.037, 0.082] ($P < 0.001$)	0.259 [0.218, 0.300] ($P < 0.001$)	0.027 [-0.006, 0.059] ($P = 0.109$)	0.014 [0.004, 0.023] ($P = 0.004$)
Collab. switch to remote (β)	0.949 [0.754, 1.143] ($P < 0.001$)	-0.168 [-0.201, -0.135] ($P < 0.001$)	-0.099 [-0.134, -0.064] ($P < 0.001$)	0.271 [0.212, 0.329] ($P < 0.001$)	0.077 [0.028, 0.126] ($P = 0.002$)	0.087 [0.073, 0.101] ($P < 0.001$)
Total effect ($\delta + \beta$)	1.692 [1.510, 1.874] ($P < 0.001$)	-0.154 [-0.186, -0.122] ($P < 0.001$)	-0.040 [-0.074, -0.005] ($P = 0.024$)	0.529 [0.478, 0.581] ($P < 0.001$)	0.104 [0.065, 0.142] ($P < 0.001$)	0.100 [0.087, 0.113] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.672	0.848	0.838	0.824	0.858	0.847
R^2 (w/o FE)	0.009	0.007	0.002	0.005	0.001	0.006
N	7,865	7,865	7,865	7,865	7,865	7,865

Supplementary Table 15: **Effects of remote work on communication media for people with short tenure at Microsoft.** These are coefficients from regressions based on Equation (1), using only employees who had been in Microsoft for less than a year. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	0.743 [0.627, 0.859] ($P < 0.001$)	0.015 [-0.006, 0.035] ($P = 0.169$)	0.060 [0.037, 0.082] ($P < 0.001$)	0.259 [0.218, 0.300] ($P < 0.001$)	0.027 [-0.006, 0.059] ($P = 0.109$)	0.014 [0.004, 0.023] ($P = 0.004$)
Collab. switch to remote (β)	0.949 [0.754, 1.143] ($P < 0.001$)	-0.168 [-0.201, -0.135] ($P < 0.001$)	-0.099 [-0.134, -0.064] ($P < 0.001$)	0.271 [0.212, 0.329] ($P < 0.001$)	0.077 [0.028, 0.126] ($P = 0.002$)	0.087 [0.073, 0.101] ($P < 0.001$)
Total effect ($\delta + \beta$)	1.692 [1.510, 1.874] ($P < 0.001$)	-0.154 [-0.186, -0.122] ($P < 0.001$)	-0.040 [-0.074, -0.005] ($P = 0.024$)	0.529 [0.478, 0.581] ($P < 0.001$)	0.104 [0.065, 0.142] ($P < 0.001$)	0.100 [0.087, 0.113] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.702	0.860	0.855	0.837	0.823	0.879
R^2 (w/o FE)	0.015	0.004	0.002	0.011	0.000	0.010
N	53,317	53,317	53,317	53,317	53,317	53,317

Supplementary Table 16: **Effects of remote work on communication media for people with long tenure at Microsoft.** These are coefficients from regressions based on Equation (1), using only employees who had been in Microsoft for more than a year. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.



Supplementary Figure 3: **Effects of remote work on the use of communication media by tenure at Microsoft.** These are the causal effects, estimated separately for people who had been in Microsoft for less/more than a year as of February 2020, of both an employee and their colleagues switching to remote work on hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. They are $(\beta + \delta)$ from Equation (1), normalized by the average level in February. Symbols depict point estimates and lines depict 95% confidence intervals.

	Short tenure	Long tenure
# Ties	0.668	1.055
# Groups	0.635	1.060
# Cross-group ties	0.589	1.068
Share of time w/ cross-group ties	0.830	1.028
# Bridging ties	0.641	1.061
Share of time w/ bridging ties	0.936	1.011
Indiv. clustering coeff.	1.265	0.954
Share of time w/ weak ties	0.984	1.002
# Churned ties	0.624	1.064
# Added ties	0.688	1.051
Share of time w/ added ties	1.053	0.987
Unscheduled call hours	0.757	1.041
Scheduled meeting hours	0.831	1.028
Meeting + call hours	0.826	1.028
Instant messages sent	0.948	1.012
Emails sent	0.625	1.061
Workweek hours	0.893	1.018

Supplementary Table 17: **Relative levels of collaboration measures for workers with different length of tenure at Microsoft.** This table shows the relative levels of collaboration measures in February, for people who had been in Microsoft for less/more than a year, with respect to the average across all US employees. These outcomes include the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the entropy of the distribution of time spent collaborating with each of their collaborators, the number of collaborators in the previous month that they no longer collaborate with, the number of current collaborators they did not collaborate with the previous month, the share of time spent with collaborators they did not (new) and did (old) collaborate with the previous month, hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours.

Heterogeneous treatment effects – role type

Supplementary Figure 4 shows the remote work effects on whom people collaborate with broken down by role type (corresponding results are in Supplementary Tables 18 through 21). The effects on use of communication media are in the right panels of main text Figure 6 (corresponding results are in Supplementary Tables 22 and 23). To help with interpreting these results, Supplementary Table 24 shows how the baseline levels for engineers and non-engineers compare to the average.

	Number of				% time with ties that are			
	Ties		Cross-group Ties		Indiv. clust. coeff.	Cross-group		Weak
	Groups	Bridging Ties	Groups	Bridging Ties		Bridging	Weak	
Ego switch to remote (δ)	-0.026 ($P = 0.017$)	-0.027 ($P = 0.026$)	-0.012 ($P = 0.369$)	-0.134 ($P < 0.001$)	0.051 ($P = 0.039$)	-0.338 ($P < 0.001$)	-0.149 ($P < 0.001$)	-0.149 ($P < 0.001$)
Collab. switch to remote (β)	0.011 ($P = 0.026, 0.048$)	-0.034 ($P = 0.081, 0.013$)	-0.014 ($P = 0.060, 0.031$)	-0.005 ($P = 0.054, 0.044$)	0.018 ($P = 0.112, 0.148$)	-0.125 ($P = 0.314, 0.064$)	-0.278 ($P < 0.001$)	-0.278 ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.015 ($P = 0.404$)	-0.061 ($P = 0.108, -0.015$)	-0.027 ($P = 0.070, 0.017$)	-0.139 ($P < 0.001$)	0.069 ($P = 0.053, 0.192$)	-0.463 ($P < 0.001$)	-0.428 ($P < 0.001$)	-0.428 ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.907	0.891	0.895	0.839	0.770	0.607	0.571	0.571
R^2 (w/o FE)	0.000	0.001	0.000	0.005	0.001	0.011	0.017	0.017
N	29,510	29,510	29,510	29,510	29,510	29,510	29,510	29,510

Supplementary Table 18: **Effects of remote work on collaboration networks for engineers (part 1).** These are coefficients from regressions based on Equation (1) using only employees who are engineers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	0.036 [-0.002, 0.074] ($P = 0.065$)	-0.052 [-0.084, -0.020] ($P = 0.001$)	-0.152 [-0.218, -0.086] ($P < 0.001$)	-0.043 [-0.057, -0.029] ($P < 0.001$)	0.188 [0.068, 0.308] ($P = 0.002$)
Collab. switch to remote (β)	-0.051 [-0.134, 0.031] ($P = 0.224$)	-0.014 [-0.072, 0.043] ($P = 0.625$)	-0.204 [-0.352, -0.057] ($P = 0.007$)	-0.052 [-0.081, -0.023] ($P < 0.001$)	0.394 [0.085, 0.704] ($P = 0.013$)
Total effect ($\delta + \beta$)	-0.015 [-0.104, 0.073] ($P = 0.733$)	-0.066 [-0.120, -0.013] ($P = 0.014$)	-0.356 [-0.493, -0.219] ($P < 0.001$)	-0.095 [-0.122, -0.068] ($P < 0.001$)	0.582 [0.294, 0.870] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.768	0.771	0.522	0.855	0.670
R^2 (w/o FE)	0.000	0.001	0.005	0.010	0.005
N	29,510	29,510	29,510	29,510	29,510

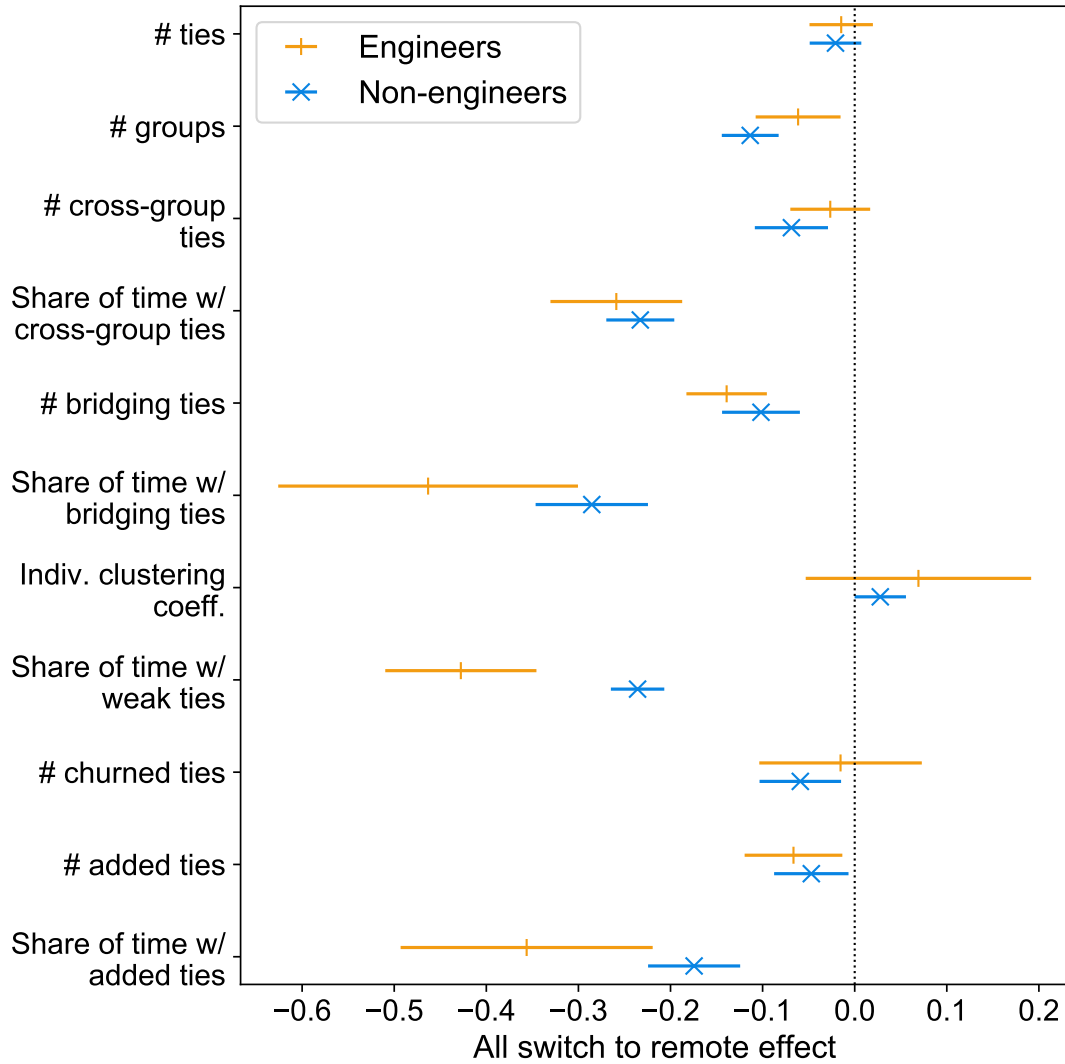
Supplementary Table 19: **Effects of remote work on collaboration networks for engineers (part 2)**. These are coefficients from regressions based on Equation (1) using only employees who are engineers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Number of				% time with ties that are			
	Ties	Groups	Cross-group Ties	Bridging Ties	Indiv. clust. coeff.	Cross-group	Bridging	Weak
Ego switch to remote (δ)	-0.025 ($P = 0.020$)	-0.034 [-0.058, -0.009] ($P = 0.007$)	-0.025 [-0.054, 0.005] ($P = 0.101$)	-0.091 [-0.122, -0.060] ($P < 0.001$)	0.011 [-0.017, 0.039] ($P = 0.450$)	-0.026 [-0.056, 0.004] ($P = 0.089$)	-0.139 [-0.195, -0.083] ($P < 0.001$)	-0.062 [-0.087, -0.036] ($P < 0.001$)
Collab. switch to remote (β)	0.004 [-0.025, 0.033] ($P = 0.772$)	-0.080 [-0.113, -0.046] ($P < 0.001$)	-0.044 [-0.084, -0.004] ($P = 0.031$)	-0.011 [-0.053, 0.032] ($P = 0.617$)	0.017 [-0.023, 0.057] ($P = 0.408$)	-0.207 [-0.250, -0.164] ($P < 0.001$)	-0.147 [-0.228, -0.065] ($P < 0.001$)	-0.174 [-0.211, -0.137] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.021 [-0.049, 0.007] ($P = 0.145$)	-0.113 [-0.144, -0.083] ($P < 0.001$)	-0.069 [-0.108, -0.029] ($P < 0.001$)	-0.102 [-0.144, -0.060] ($P < 0.001$)	0.028 [-0.000, 0.056] ($P = 0.051$)	-0.233 [-0.270, -0.196] ($P < 0.001$)	-0.285 [-0.346, -0.224] ($P < 0.001$)	-0.236 [-0.265, -0.207] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.900	0.906	0.901	0.860	0.819	0.846	0.666	0.598
R^2 (w/o FE)	0.000	0.002	0.001	0.002	0.000	0.011	0.006	0.012
N	31,672	31,672	31,672	31,672	31,672	31,672	31,672	31,672

Supplementary Table 20: **Effects of remote work on collaboration networks for non-engineers (part 1).** These are coefficients from regressions based on Equation (1) using only employees who are not engineers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the number of bridging ties an employee has, the individual clustering coefficient of an employee's ties, the share of time spent with cross-group ties, the share of time spent with bridging ties, and the share of time spent with weak ties. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	# Churned ties	# Added ties	% time with added ties	Network entropy	HHI
Ego switch to remote (δ)	-0.001 [-0.037, 0.035] ($P = 0.963$)	-0.039 [-0.069, -0.009] ($P = 0.011$)	-0.064 [-0.106, -0.022] ($P = 0.003$)	-0.025 [-0.034, -0.016] ($P < 0.001$)	0.096 [0.042, 0.149] ($P < 0.001$)
Collab. switch to remote (β)	-0.058 [-0.105, -0.011] ($P = 0.015$)	-0.008 [-0.051, 0.034] ($P = 0.701$)	-0.110 [-0.171, -0.050] ($P < 0.001$)	-0.041 [-0.054, -0.027] ($P < 0.001$)	0.142 [0.057, 0.228] ($P = 0.001$)
Total effect ($\delta + \beta$)	-0.059 [-0.103, -0.015] ($P = 0.009$)	-0.047 [-0.088, -0.007] ($P = 0.022$)	-0.174 [-0.224, -0.124] ($P < 0.001$)	-0.066 [-0.077, -0.055] ($P < 0.001$)	0.238 [0.168, 0.308] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y
R^2 (Total)	0.787	0.781	0.558	0.874	0.701
R^2 (w/o FE)	0.000	0.000	0.003	0.010	0.004
N	31,672	31,672	31,672	31,672	31,672

Supplementary Table 21: **Effects of remote work on collaboration networks for non-engineers (part 2)**. These are coefficients from regressions based on Equation (1) using only employees who are not engineers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of churned ties, the number of added ties, the share of time spent with added ties, the Shannon entropy of the distribution of time spent collaborating with each of their collaborators, and the normalized HHI index of the distribution of time spent collaborating with each of their collaborators. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.



Supplementary Figure 4: **Effects of remote work on collaboration networks by role type.** These are the causal effects, estimated separately for engineers and non-engineers, of both an employee and their colleagues switching to remote work on the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the share of time spent with cross-group ties, the number of bridging ties an employee has, the share of time spent with bridging ties, the individual clustering coefficient of an employee's ties, the share of time spent with weak ties, the number of churned ties, the number of added ties, and the share of time spent with added ties. They are $(\beta + \delta)$ from Equation (1), normalized by the average level in February. Symbols depict point estimates and horizontal lines depict 95% confidence intervals.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	0.988 [0.796, 1.180] ($P < 0.001$)	-0.013 [-0.045, 0.018] ($P = 0.401$)	0.049 [0.014, 0.083] ($P = 0.005$)	0.318 [0.248, 0.388] ($P < 0.001$)	0.044 [-0.012, 0.100] ($P = 0.121$)	0.020 [0.005, 0.035] ($P = 0.010$)
Collab. switch to remote (β)	0.678 [0.223, 1.133] ($P = 0.004$)	-0.072 [-0.132, -0.013] ($P = 0.017$)	-0.026 [-0.095, 0.043] ($P = 0.457$)	0.326 [0.212, 0.441] ($P < 0.001$)	0.065 [-0.024, 0.154] ($P = 0.155$)	0.058 [0.030, 0.086] ($P < 0.001$)
Total effect ($\delta + \beta$)	1.666 [1.209, 2.124] ($P < 0.001$)	-0.086 [-0.145, -0.027] ($P = 0.004$)	0.022 [-0.046, 0.091] ($P = 0.522$)	0.644 [0.546, 0.743] ($P < 0.001$)	0.109 [0.032, 0.185] ($P = 0.005$)	0.077 [0.051, 0.103] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.699	0.880	0.870	0.825	0.774	0.880
R^2 (w/o FE)	0.010	0.001	0.001	0.009	0.000	0.004
N	29,510	29,510	29,510	29,510	29,510	29,510

Supplementary Table 22: **Effects of remote work on communication media for engineers.**

These are coefficients from regressions based on Equation (1), using only employees who are engineers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Unscheduled call	Scheduled meeting	Meeting + call	IMs	Emails	Workweek hrs
Ego switch to remote (δ)	0.541 [0.417, 0.664] ($P < 0.001$)	0.022 [-0.003, 0.047] ($P = 0.084$)	0.054 [0.028, 0.080] ($P < 0.001$)	0.190 [0.147, 0.233] ($P < 0.001$)	-0.001 [-0.032, 0.030] ($P = 0.943$)	0.004 [-0.008, 0.015] ($P = 0.533$)
Collab. switch to remote (β)	0.443 [0.258, 0.627] ($P < 0.001$)	-0.167 [-0.206, -0.128] ($P < 0.001$)	-0.129 [-0.169, -0.089] ($P < 0.001$)	0.196 [0.135, 0.258] ($P < 0.001$)	0.097 [0.049, 0.145] ($P < 0.001$)	0.070 [0.054, 0.087] ($P < 0.001$)
Total effect ($\delta + \beta$)	0.983 [0.833, 1.133] ($P < 0.001$)	-0.145 [-0.182, -0.107] ($P < 0.001$)	-0.075 [-0.114, -0.036] ($P < 0.001$)	0.387 [0.330, 0.443] ($P < 0.001$)	0.096 [0.056, 0.136] ($P < 0.001$)	0.074 [0.059, 0.088] ($P < 0.001$)
Indiv. FE	Y	Y	Y	Y	Y	Y
Month FE	Y	Y	Y	Y	Y	Y
R^2 (Total)	0.705	0.826	0.827	0.851	0.839	0.866
R^2 (w/o FE)	0.010	0.004	0.002	0.009	0.000	0.007
N	31,672	31,672	31,672	31,672	31,672	31,672

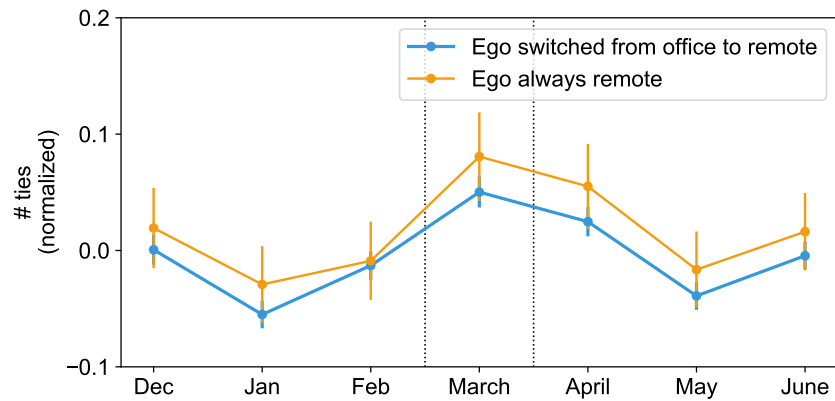
Supplementary Table 23: **Effects of remote work on communication media for non-engineers.** These are coefficients from regressions based on Equation (1), using only employees who are not engineers. The first line is effect of an employee switching, the second line is the effect of all an employee's collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours. Standard errors are clustered at the level of the employee's manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.

	Engineering	Non-engineering
# Ties	0.801	1.196
# Groups	0.730	1.262
# Cross-group ties	0.707	1.286
Share of time w/ cross-group ties	0.849	1.146
# Bridging ties	0.784	1.215
Share of time w/ bridging ties	0.992	1.011
Indiv. clustering coeff.	1.164	0.836
Share of time w/ weak ties	1.016	0.985
# Churned ties	0.806	1.196
# Added ties	0.821	1.175
Share of time w/ added ties	1.037	0.956
Unscheduled call hours	0.744	1.248
Scheduled meeting hours	0.897	1.100
Meeting + call hours	0.888	1.109
Instant messages sent	1.024	0.985
Emails sent	0.628	1.355
Workweek hours	0.934	1.065

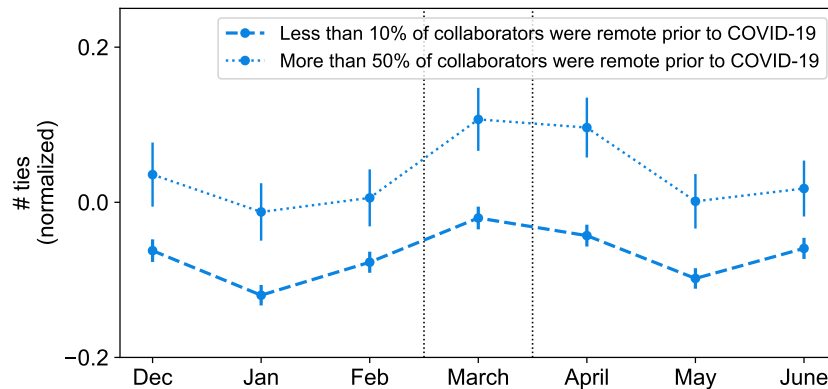
Supplementary Table 24: **Relative levels of collaboration measures for workers with different types of roles at Microsoft.** This table shows the relative levels of collaboration measures in February, for people who were engineers and people who were not engineers. We show relative levels for each of our outcomes: the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the share of time spent with cross-group ties, the number of bridging ties an employee has, the share of time spent with bridging ties, the individual clustering coefficient of an employee's ties, the share of time spent with weak ties, the number of churned ties, the number of added ties, the share of time spent with added ties, hours spent in unscheduled calls, hours spent in scheduled meetings, the sum of scheduled meetings and unscheduled call hours, instant message sent, emails sent, and estimated workweek hours.

Time trends

Supplementary Figures 5–14 show the monthly averages for our collaboration network outcomes for different groups of employees. Supplementary Figures 15–19 show the weekly averages of our communication media outcomes (including workweek hours). Comparison of the time trends for different groups verifies the plausibility of our modified DiD model's parallel trends assumptions.

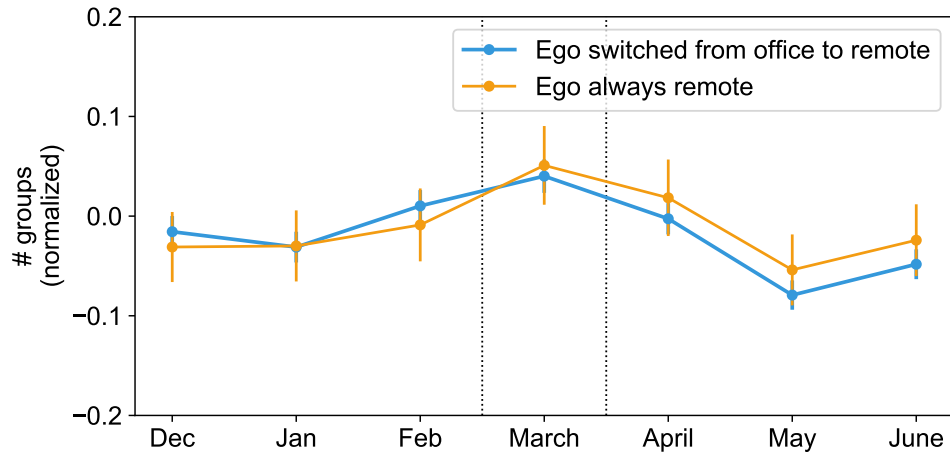


(a) Ego switch to remote, with matching

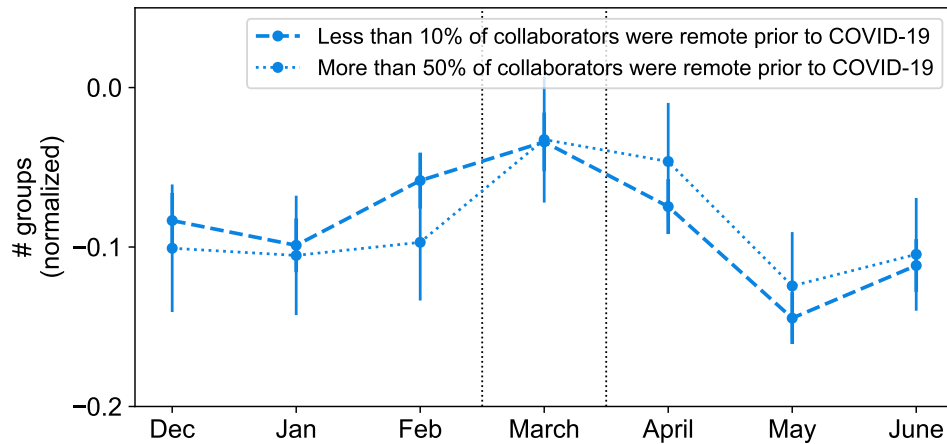


(b) Collaborators switch to remote, without matching

Supplementary Figure 5: **Time trends for number of ties.** These graphs show the average number of ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

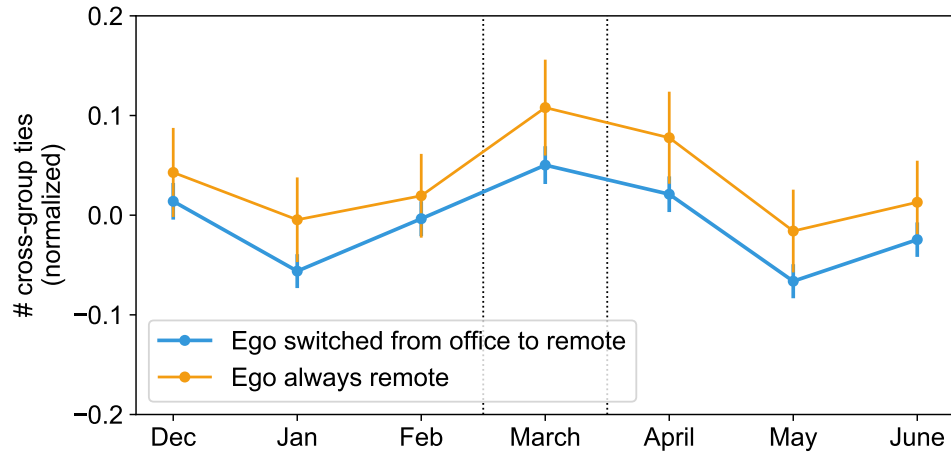


(a) Ego switch to remote, with matching

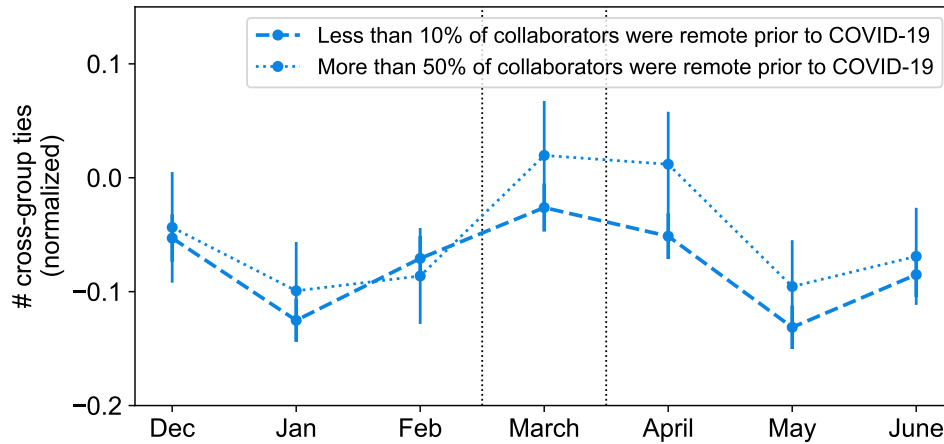


(b) Collaborators switch to remote, without matching

Supplementary Figure 6: Time trends for number of business groups. These graphs show the average number of distinct business groups connected to per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

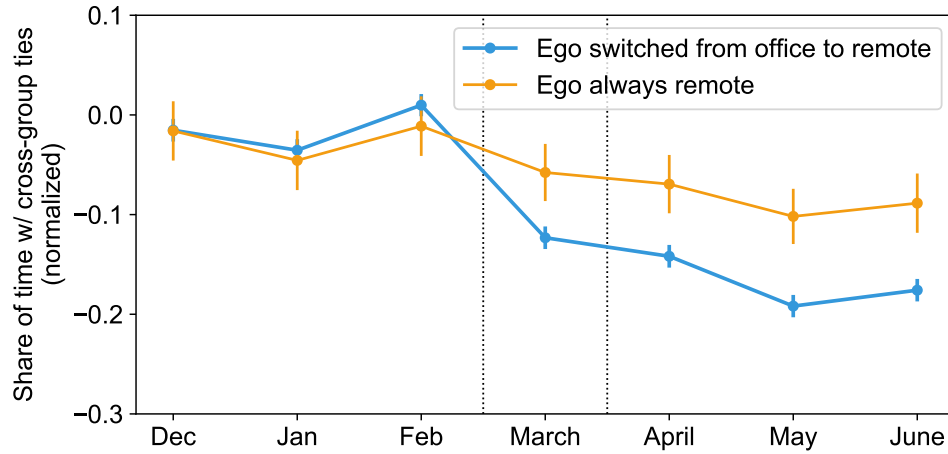


(a) Ego switch to remote, with matching

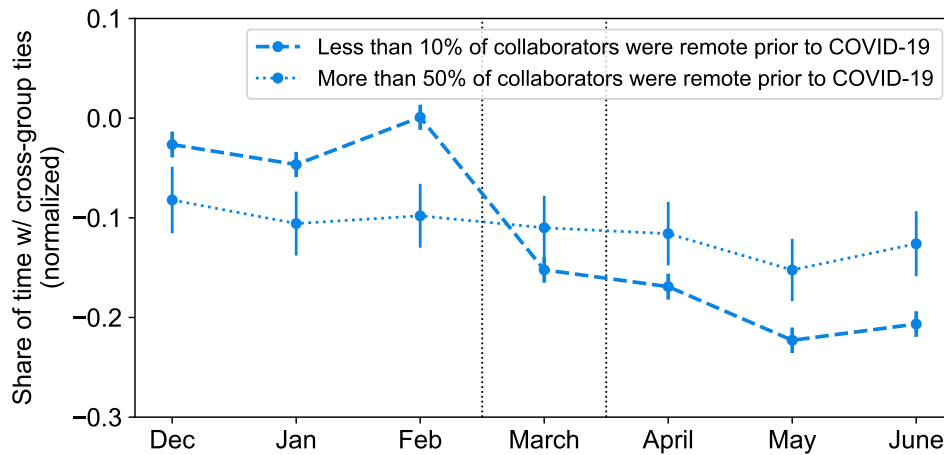


(b) Collaborators switch to remote, without matching

Supplementary Figure 7: Time trends for number of cross-group ties. These graphs show the average number of cross-group ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

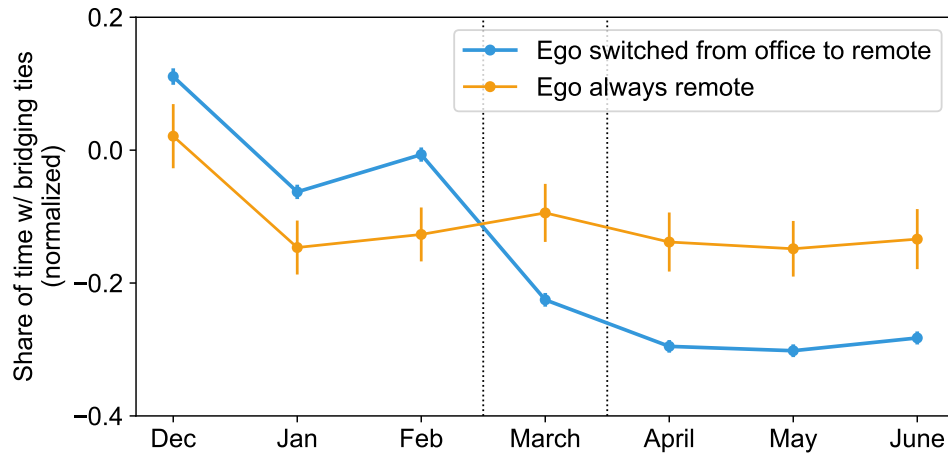


(a) Ego switch to remote, with matching

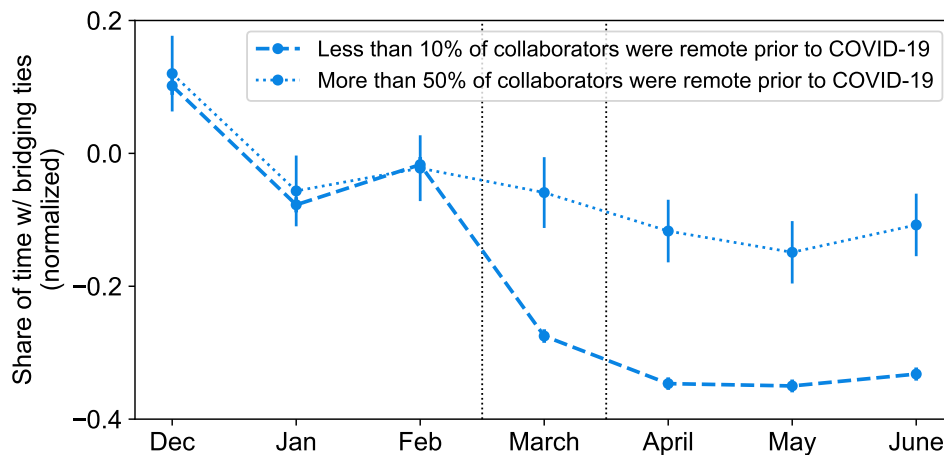


(b) Collaborators switch to remote, without matching

Supplementary Figure 8: Time trends for share of time with cross-group ties. These graphs show the average share of time with cross-group ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

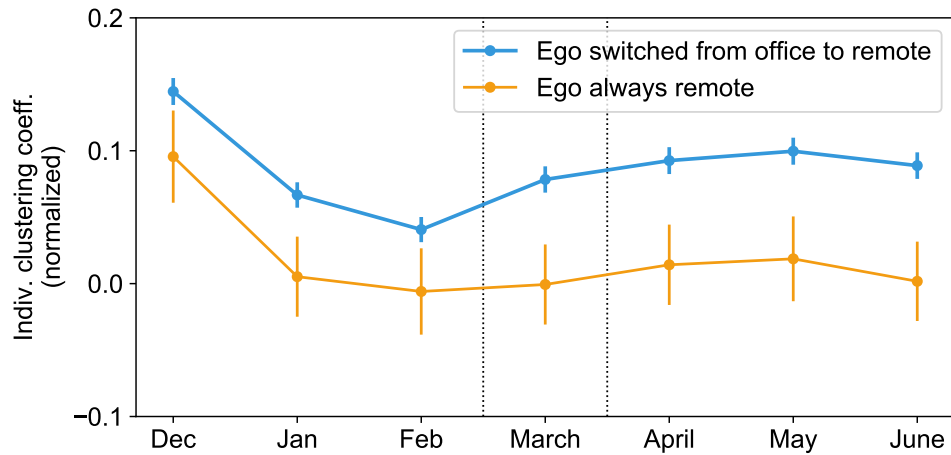


(a) Ego switch to remote, with matching

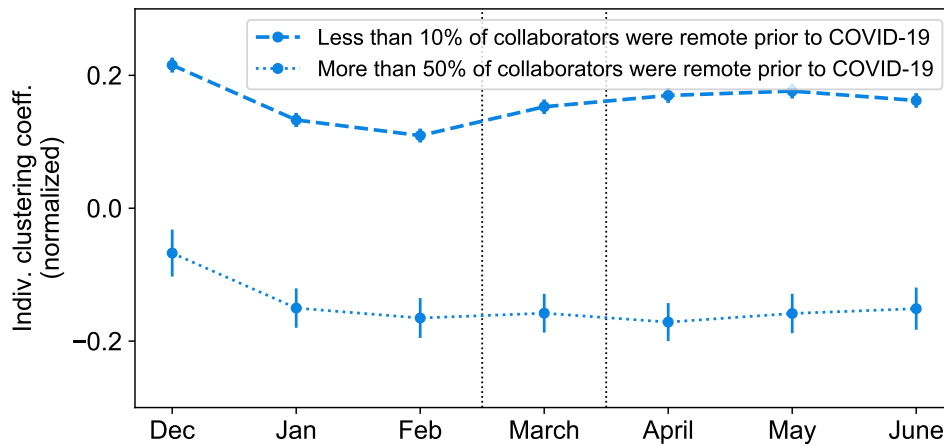


(b) Collaborators switch to remote, without matching

Supplementary Figure 9: Time trends for the share of time with bridging ties. These graphs show the average share of time with bridging ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

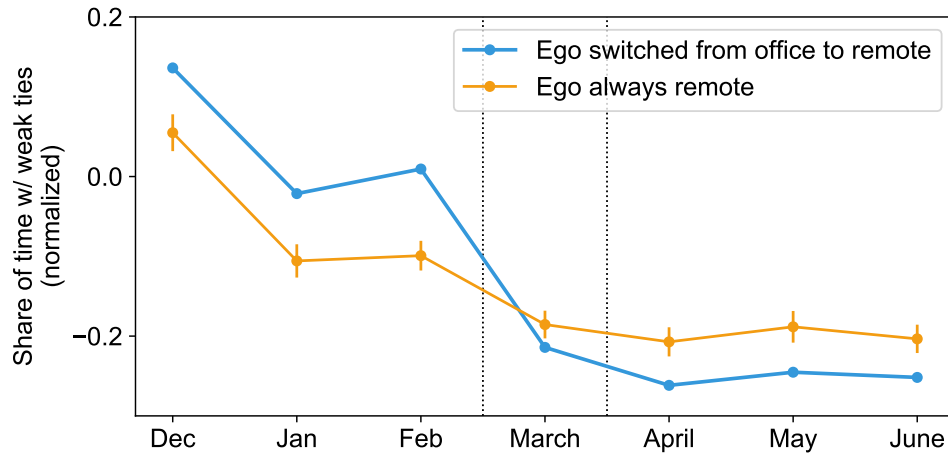


(a) Ego switch to remote, with matching

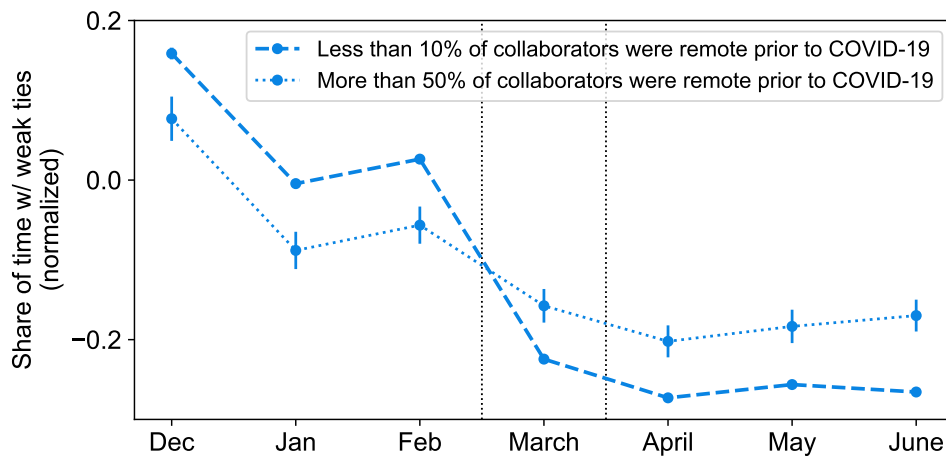


(b) Collaborators switch to remote, without matching

Supplementary Figure 10: **Time trends for individual clustering coefficient.** These graphs show the average individual clustering coefficient per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

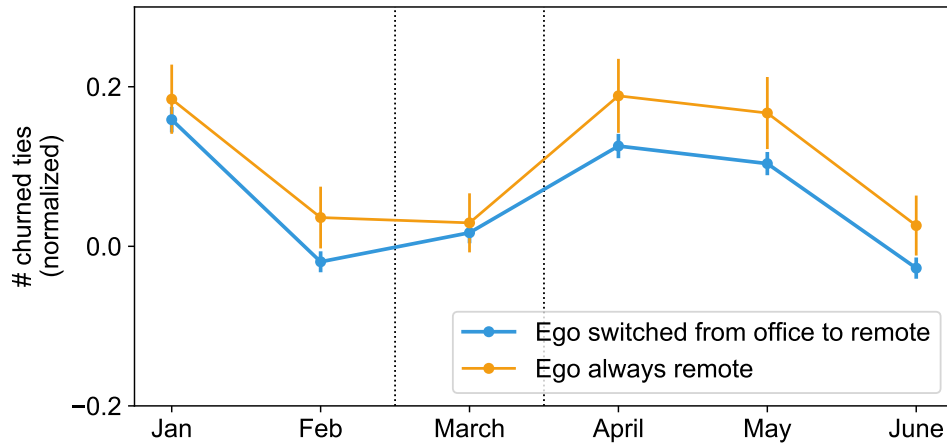


(a) Ego switch to remote, with matching

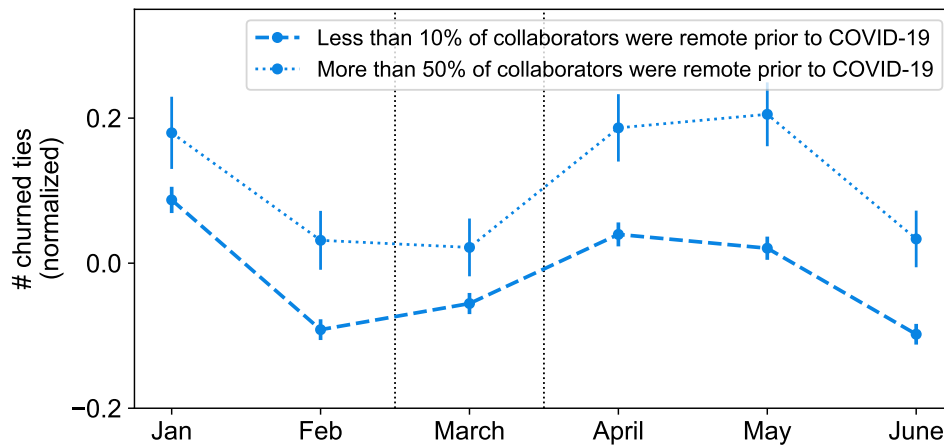


(b) Collaborators switch to remote, without matching

Supplementary Figure 11: **Time trends for share of time with weak ties.** These graphs show the average share of time with weak ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

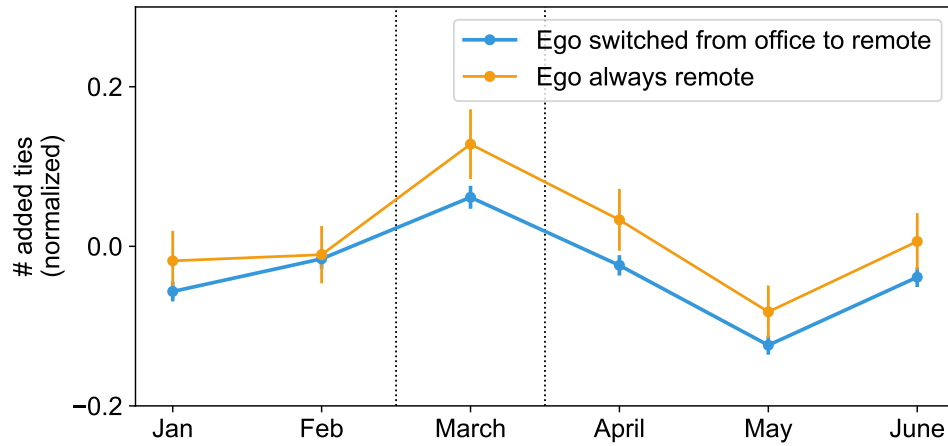


(a) Ego switch to remote, with matching

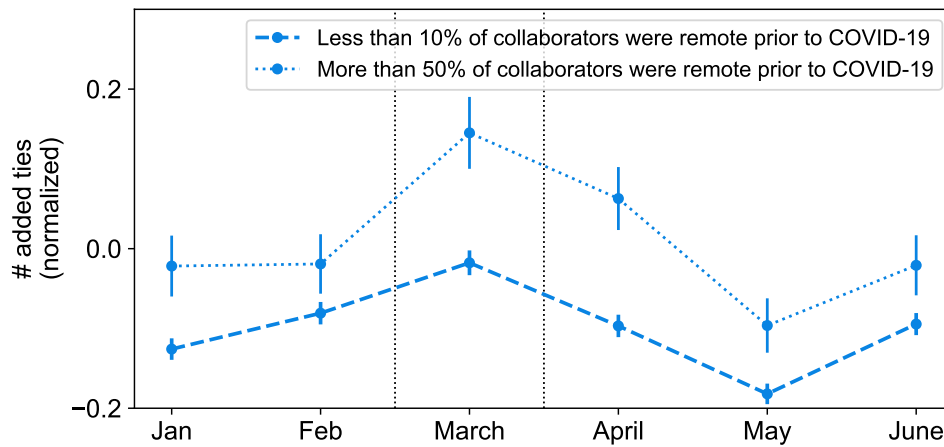


(b) Collaborators switch to remote, without matching

Supplementary Figure 12: **Time trends for number of churned ties.** These graphs show the average number of churned ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

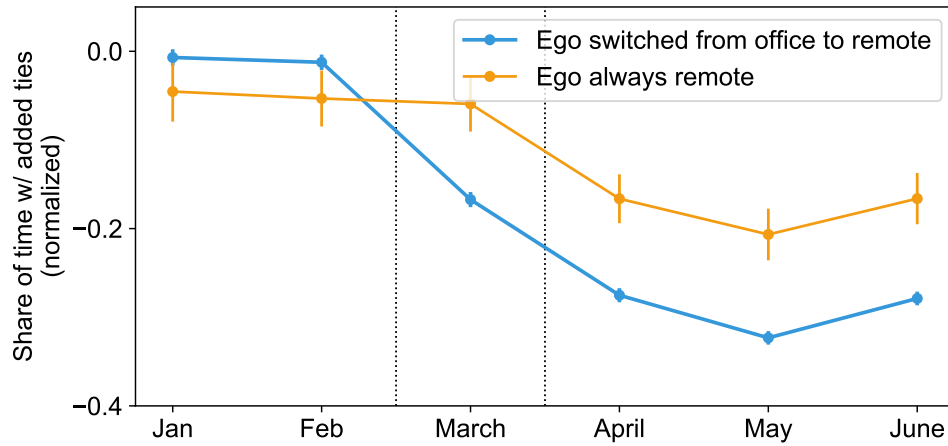


(a) Ego switch to remote, with matching

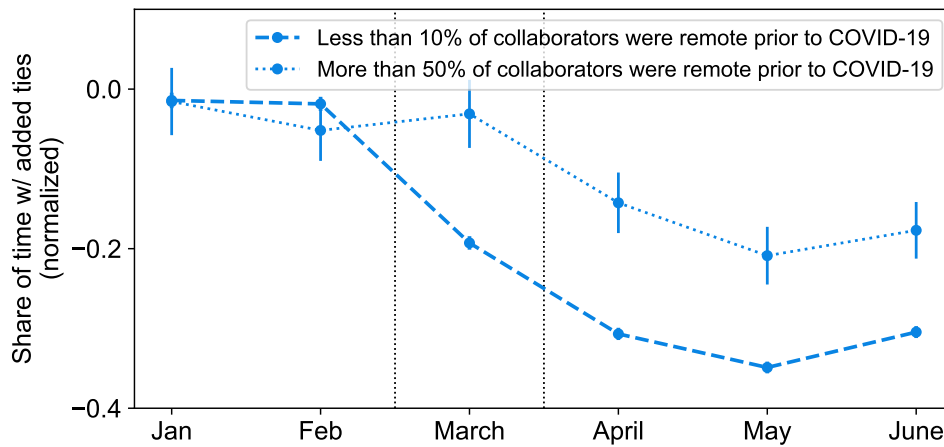


(b) Collaborators switch to remote, without matching

Supplementary Figure 13: **Time trends for number of added ties.** These graphs show the average number of added ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

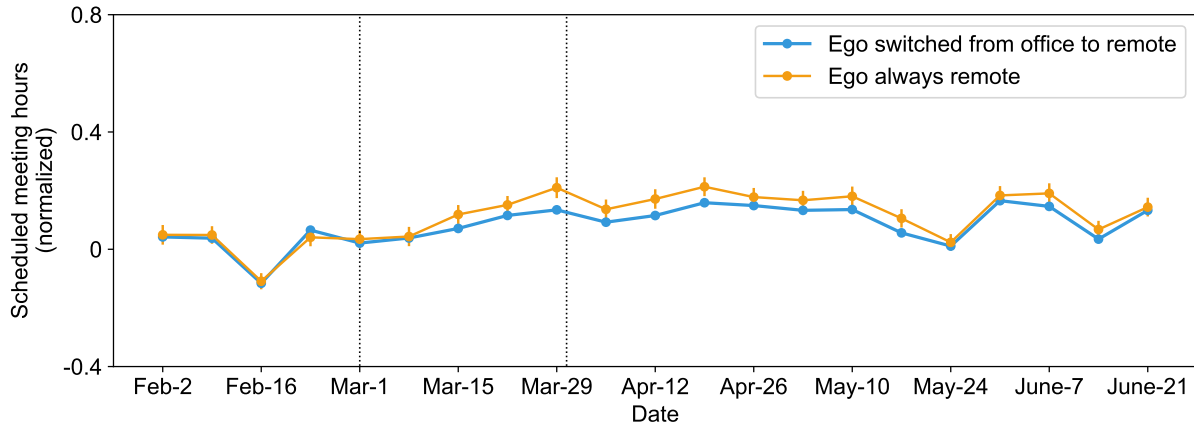


(a) Ego switch to remote, with matching

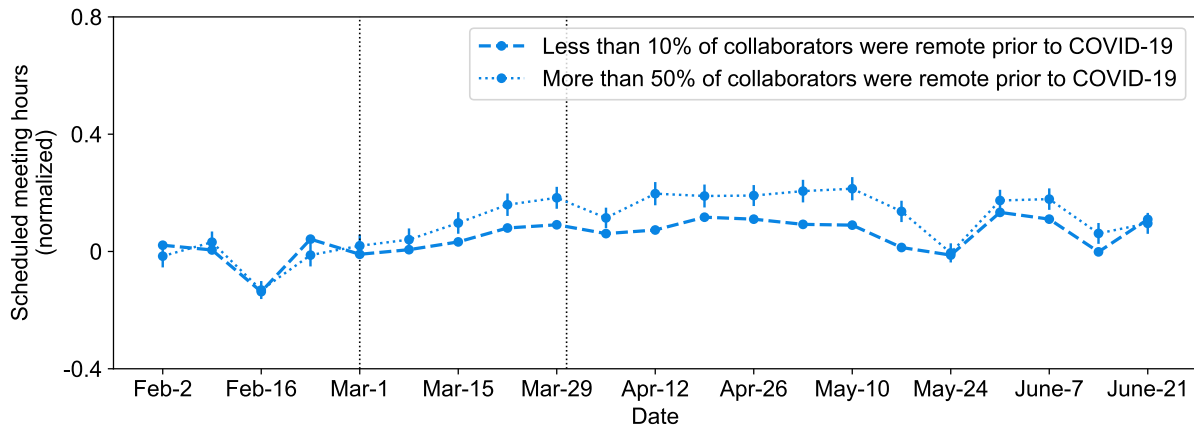


(b) Collaborators switch to remote, without matching

Supplementary Figure 14: **Time trends for share of time with added ties.** These graphs show the average share of time with added ties per month for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

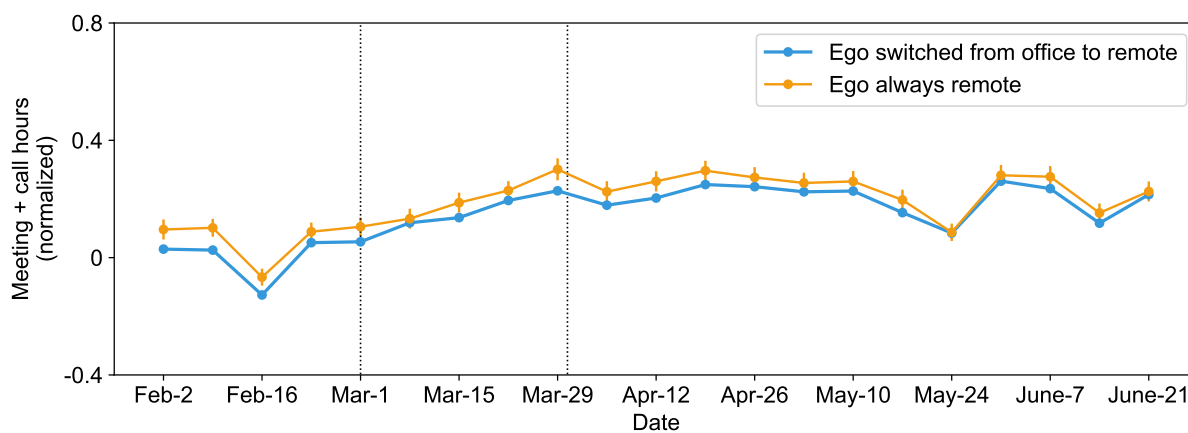


(a) Ego switch to remote, with matching

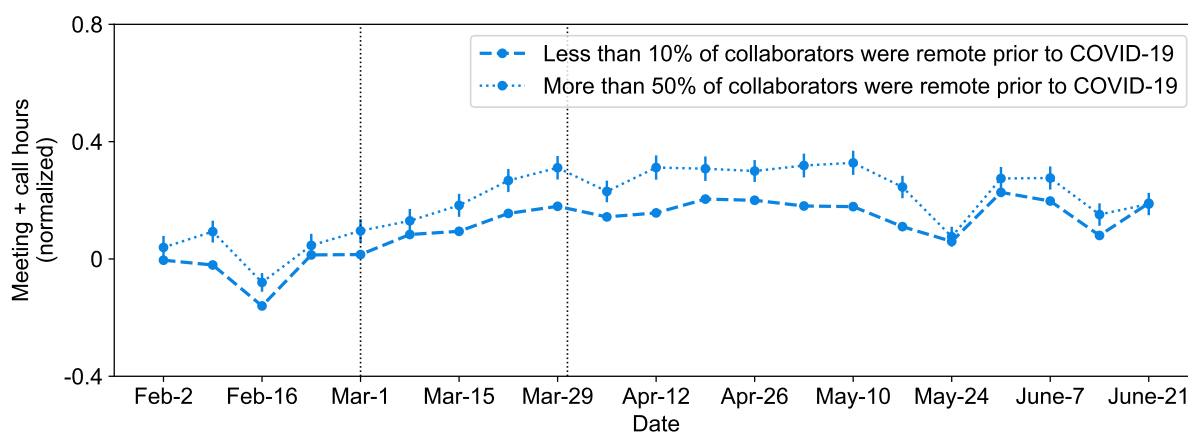


(b) Collaborators switch to remote, without matching

Supplementary Figure 15: Time trends for scheduled meeting hours. These graphs show the average number of scheduled meeting hours per week for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the weekly average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

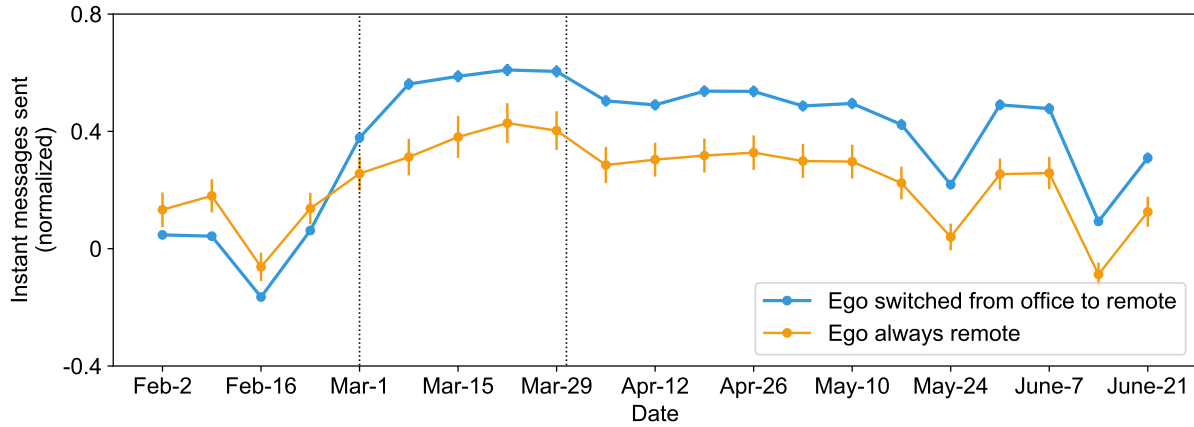


(a) Ego switch to remote, with matching

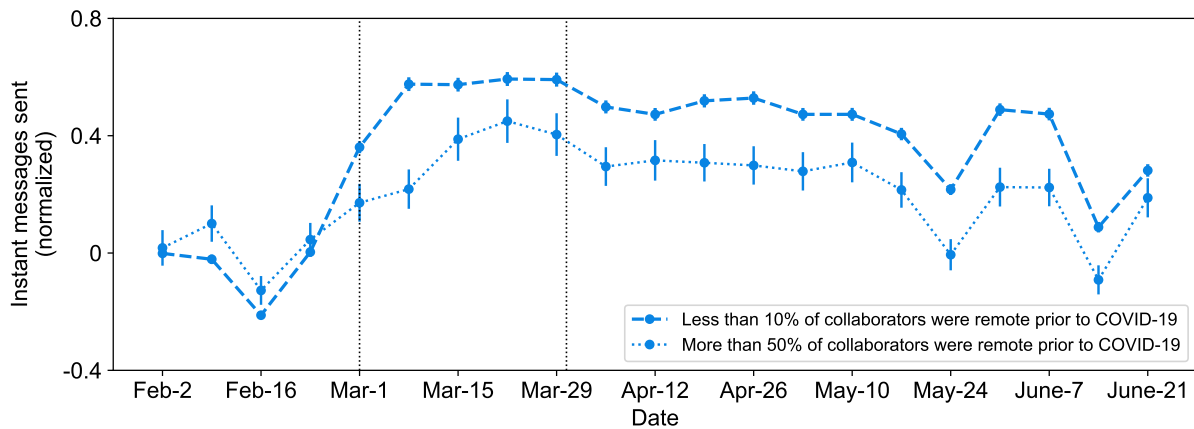


(b) Collaborators switch to remote, without matching

Supplementary Figure 16: **Time trends for total video/audio call hours.** These graphs show the average number of total audio/video call hours per week for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the weekly average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

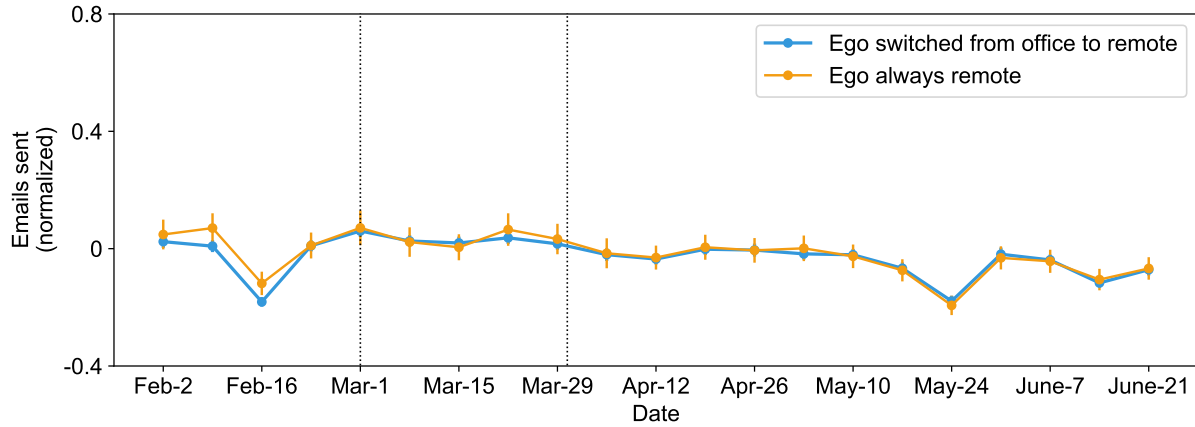


(a) Ego switch to remote, with matching

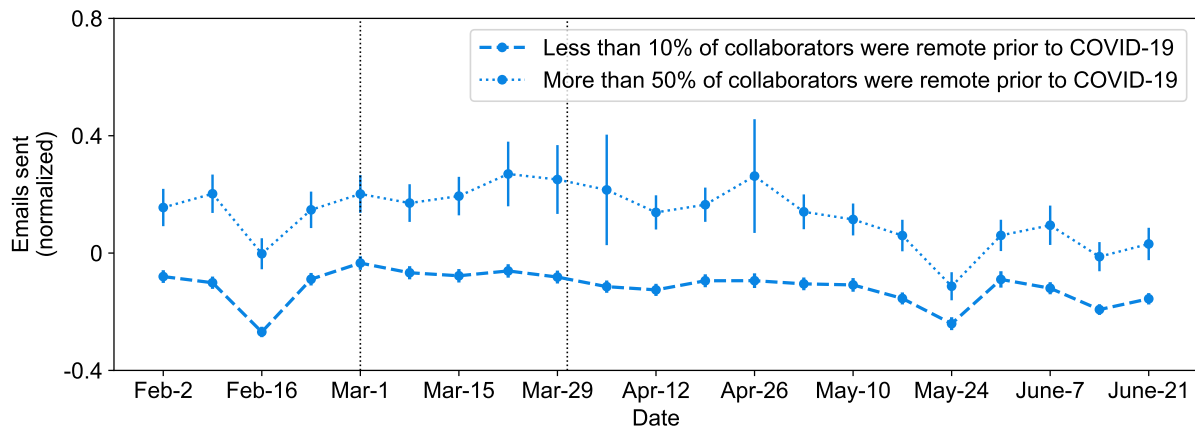


(b) Collaborators switch to remote, without matching

Supplementary Figure 17: **Time trends for instant messages sent.** These graphs show the average number of instant messages sent per week for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the weekly average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

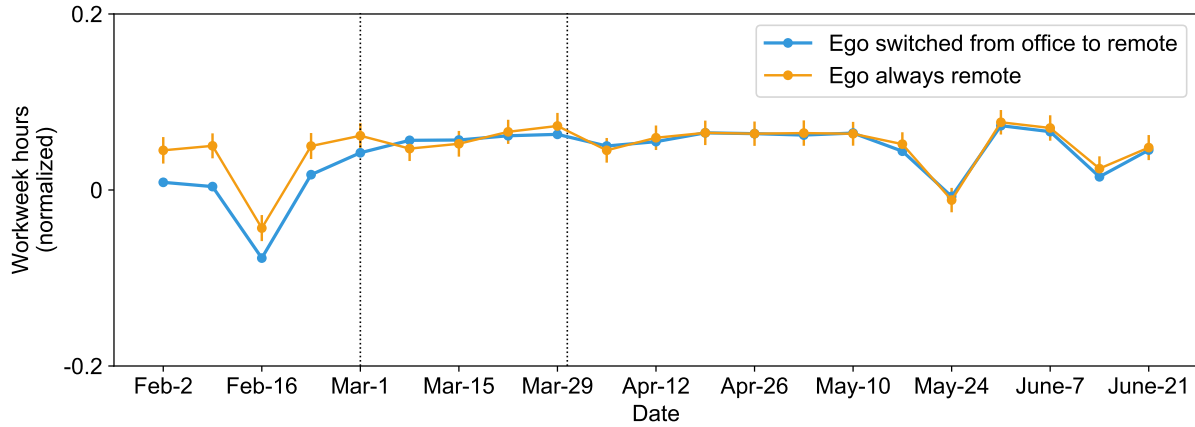


(a) Ego switch to remote, with matching

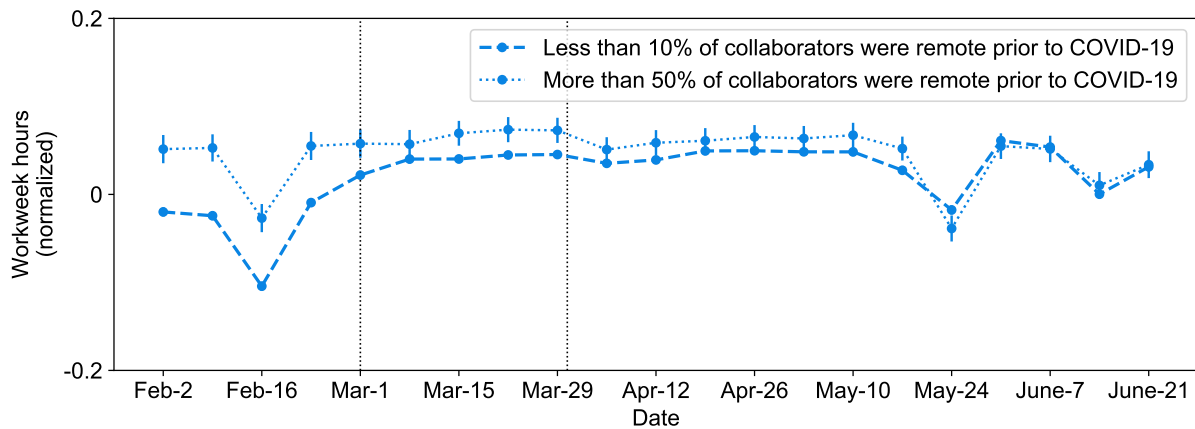


(b) Collaborators switch to remote, without matching

Supplementary Figure 18: Time trends for emails sent. These graphs show the average number of emails sent per week for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the weekly average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.



(a) Ego switch to remote, with matching

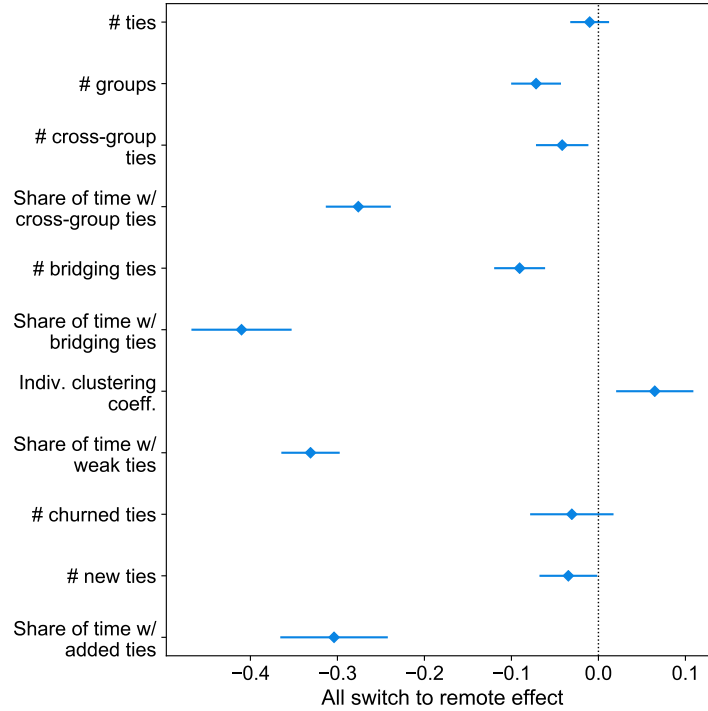


(b) Collaborators switch to remote, without matching

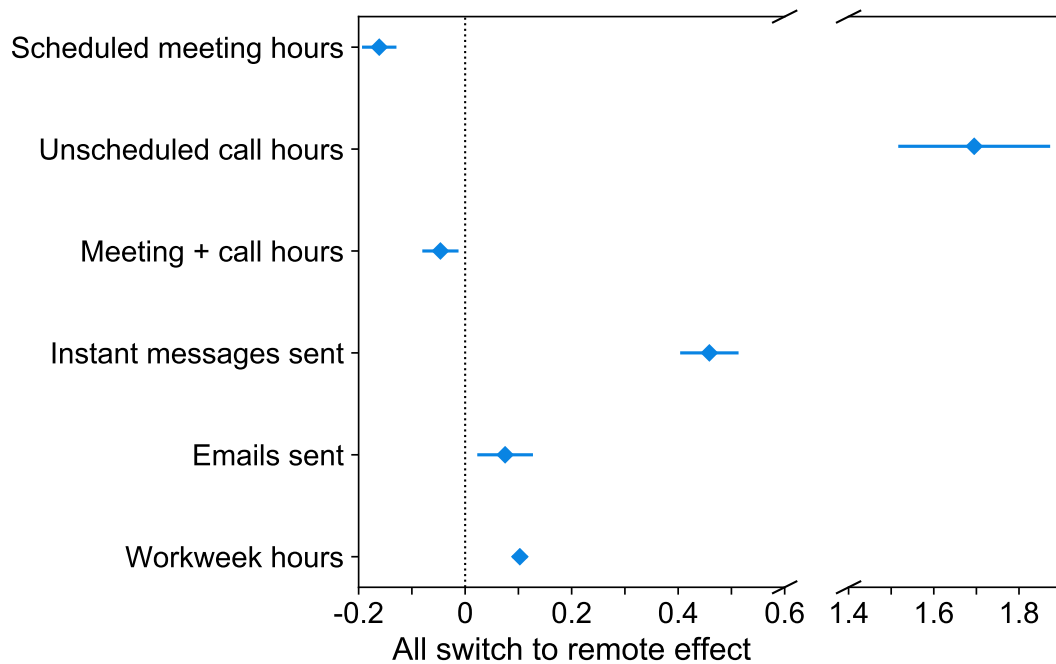
Supplementary Figure 19: **Time trends for workweek hours.** These graphs show the average number of workweek hours per week for different groups of employees. Panel (a) shows employees who, prior to COVID-19, worked from the office (blue) and a matched sample of employees who worked from home (orange); panel (b) breaks the blue line in Figure (a) into two subgroups: employees who, prior to COVID-19, had less than 10% of their collaborators working remotely (dashed) and those who had more than 50% of their coworkers working remotely (dotted). All the time series are normalized by subtracting and dividing by the weekly average value across all employees during February 2020. Office workers transitioned to WFH during the week of March 1 2020. Error bars depict 95% confidence intervals, with standard errors clustered at the team level, and are in some places thinner than the lines in the figure.

Alternative matching method

Supplementary Figures 20 and 21 show our results when using the alternative matching procedure [60] described in the Methods section. The results are qualitatively similar to our main results.



Supplementary Figure 20: **Effects of firm-wide remote work on collaboration networks using alternative matching procedure.** These are the estimated causal effects of both an employee and that employee's colleagues switching to remote work on the number of collaborators an employee has, the number of distinct groups the employee collaborates with, the number of cross-group ties an employee has, the share of time an employee spends collaborating with cross-group ties, the number of bridging ties an employee has, the share of time an employee spends collaborating with bridging ties, the individual clustering coefficient of an individual's ego network, the share of time an employee spent collaborating with weak ties, the number of churned collaborators, the number of added collaborators, and the share of time spent with added collaborators. They are $(\beta + \delta)$ from Equation (1), normalized by the average level in February. Estimates are generated using the alternative matching procedure. Symbols depict point estimates and lines depict 95% confidence intervals.



Supplementary Figure 21: **Effects of firm-wide remote work on the use of communication media using alternative matching procedure.** These are the estimated causal effects of both an employee and their colleagues switching to remote work on the employee's hours spent in scheduled meetings, hours spent in unscheduled calls, the sum of meetings and call hours, instant message sent, emails sent, and estimated workweek hours. They are $(\beta + \delta)$ from Equation (1), normalized by the average level in February. Estimates are generated using the alternative matching procedure. Symbols depict point estimates and lines depict 95% confidence intervals.

Alternative added/deleted tie definitions

As a robustness check, we repeat our network dynamics-related collaboration network analyses using an alternative definition for a new tie, in which a tie is “added” if it did not exist in month $t - 2$ *and* month $t - 1$, but exists in month t , and an alternative definition for a deleted tie, in which a tie is “deleted” if it existed in both month $t - 2$ *and* month $t - 1$, but does not exist in month t . The results of these analyses are found Supplementary Table 25, and are qualitatively similar to our main network dynamics results.

	# Churned ties	# Added ties	% time with added ties
Ego switch to remote (δ)	0.019 [-0.003, 0.041] ($P = 0.099$)	-0.049 [-0.074, -0.024] ($P < 0.001$)	-0.122 [-0.166, -0.079] ($P < 0.001$)
Collab. switch to remote (β)	-0.084 [-0.114, -0.053] ($P < 0.001$)	0.037 [0.000, 0.075] ($P = 0.049$)	-0.158 [-0.226, -0.090] ($P < 0.001$)
Total effect ($\delta + \beta$)	-0.065 [-0.094, -0.036] ($P < 0.001$)	-0.012 [-0.047, 0.023] ($P = 0.509$)	-0.280 [-0.341, -0.220] ($P < 0.001$)
Indiv. FE	Y	Y	Y
Month FE	Y	Y	Y
R^2 (Total)	0.873	0.750	0.521
R^2 (w/o FE)	0.001	0.000	0.004
N	61,182	61,182	61,182

Supplementary Table 25: **Effects of remote work on collaboration network dynamics (alternate definitions)**. These are coefficients from regressions based on Equation (1). The first line is effect of an employee switching, the second line is the effect of all an employee’s collaborators switching and the third line is the sum of the two, all normalized by the average level in February. All regressions include individual and month fixed effects. The dependent variables are the number of added ties, the number of churned ties, and the share of time spent with added ties. Estimation is done using alternate definitions for these outcomes. Standard errors are clustered at the level of the employee’s manager. 95% confidence intervals are shown in square brackets, and p -values are shown in parentheses.