Social Learning Along International Migrant Networks

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Literatures across economics emphasize the importance of social networks in transmitting information on new technologies, labor market conditions, goods market conditions, and opportunities to trade internationally, among many others. In this paper, we focus on the role of migrant networks in transmitting information on how people respond to the Covid-19 pandemic in early 2020. Specifically, we document how pre-existing migrant networks helped transmit social distancing practices from the United States to Mexico, with significantly larger increases in social distancing in Mexican regions that were connected via the migrant network to U.S. counties exhibiting larger declines in daily mobility.[1] We rule out confounding pre-trends and find similar results even after controlling flexibly for population density, socio-economic factors, and regional Covid-19 cases in Mexico and the U.S. These results support the interpretation that information flows drove the observed relationship between U.S. and Mexican social distancing behavior, rather than disease transmission through contemporaneous migration or migrant sorting across similar locations.

We measure existing migrant networks using administrative data from Mexico's *Matrícula Consular de Alta Seguridad* (MCAS) identity card program for Mexican citizens in the U.S. These data allow us to measure migrants' destination distributions across U.S. counties for each Mexican source region (*municipio*). We measure U.S. social distancing behavior using county-level smartphone tracking data from Unacast and Facebook Data for Good, which record proportional declines in mobility relative to the pre-Covid period. For each Mexican *municipio*, we measure exposure to U.S. social distancing as a migrant-destination-weighted average of social distancing across U.S. counties.[2]

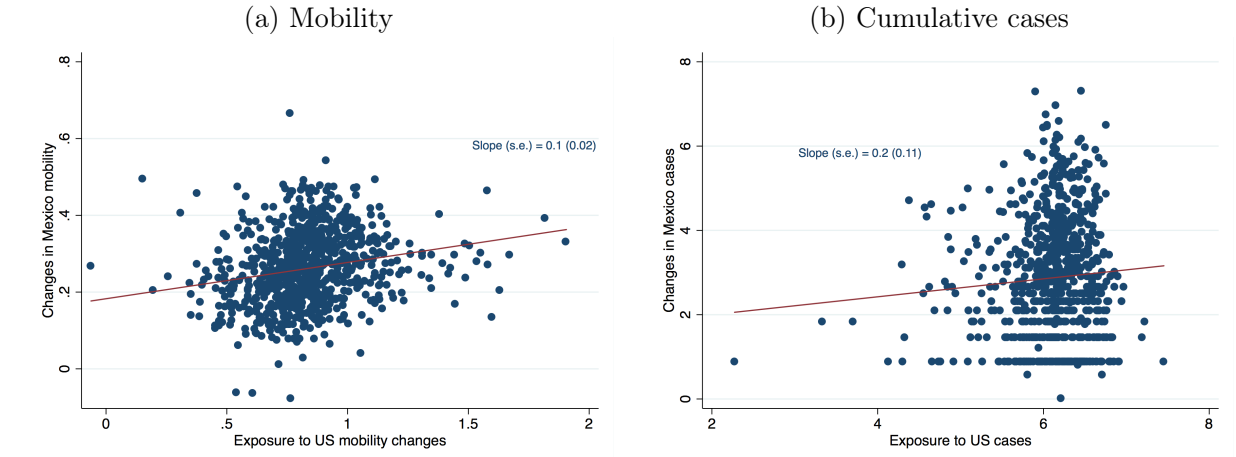
Our baseline specification relates social distancing in each Mexican *municipio* i in week t to its exposure to U.S. social distancing, *municipio* fixed effects, week fixed effects, and *municipio*-week controls. Figure 6 panel (a) shows the associated bivariate scatter plot using first-differences, and Table 3 shows the full estimation results with the entire panel, finding that social distancing increased most in Mexican regions whose migrants live in U.S. counties where social distancing was most prevalent.[3] Column (1) implies that a one-standard-deviation larger exposure to U.S. mobility reduction led to a 0.47-standard deviation larger increase in social distancing in Mexico. Similar results appear when controlling for the actual number of cases in Mexico and the U.S., suggesting that the observed relationship results from information transfer rather than through

[1] Recall that the U.S. outbreak led that of Mexico by roughly two weeks.
[2] The social distancing data for Mexico is from Facebook.
[3] Note: figure and table references use numbering from the full draft.

potential contagion driven by contemporaneous migration.[4] Table 4 flexibly rules out migrant sorting as an explanation, by interacting each *municipio*'s initial characteristics, including population density and urban share, with week fixed effects, finding similar results.

While it is widely argued that migrant networks serve as conduit for transmitting information across international borders, we study a rare setting where one can observe both the migrant network and specific behaviors associated with information exposure. We provide new evidence on how exposure to novel social norms and practices in destination regions spill over to source regions through the migrant network.

Figure 6: A strong positive correlation between changes in social distancing in Mexico and the U.S. (Week 11 to Week 21), and a positive correlation between number of cases.



Note: This figure includes all Mexican municipios with at least one Covid-19 case in Week 21, and each dot is a municipio. Panel (a) shows the mobility result, where the horizontal axis is the exposure to U.S. social distancing in Week 21 minus that in Week 11 ($exposure^{pc}_{i21} - exposure^{pc}_{i11}$), and the vertical axis is the change in social distancing in a Mexican municipio between Week 21 and Week 11 ($socdist_{i21} - socdist_{i11}$). The mean (s.d.) of the x-axis is 0.8 (0.2), and the mean (s.d.) of the y-axis is 0.3 (0.1). Panel (b) shows the cumulative case result, where the horizontal axis is the change in exposures to log U.S. cumulative cases from Week 11 to Week 21 ($exposure^{cases}_{i21} - exposure^{cases}_{i11}$), and the vertical axis is the change in the log of cumulative cases in a Mexican municipio between Week 21 and Week 11 ($\ln(\text{cum cases})_{i21} - \ln(\text{cum cases})_{i11}$). The mean (s.d.) of the x-axis is 6.1 (0.5), and the mean (s.d.) of the y-axis is 2.9 (1.4).

[4] Realized Covid-19 case counts from John Hopkins University for the U.S. and the Mexican Ministry of Health. The lack of migration effect is unsurprising, as travel from the U.S. to Mexico fell precipitously after the beginning of the U.S. outbreak (see Figure 2 in the paper).

Table 3: Larger exposures to U.S. social distancing led to more social distancing in Mexico, Week 9 to Week 21

Outcome:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mexico social dist.	Municipios with cases>0				All municipios			
Exposure to U.S. social dist.	0.05***	0.05***	0.04***	0.05***	0.03***	0.03***	0.03***	0.03***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Exposure to log U.S. cum. cases		-0.01***		-0.01***		-0.01***		-0.01***
		(0.003)		(0.003)		(0.002)		(0.002)
Log cum. cases in Mexico muni.			0.02***	0.02***			0.01***	0.02***
			(0.001)	(0.001)			(0.001)	(0.001)
Constant	0.22***	0.28***	0.19***	0.28***	0.21***	0.26***	0.19***	0.26***
	(0.000)	(0.015)	(0.001)	(0.015)	(0.000)	(0.013)	(0.001)	(0.013)
Observations	10,051	10,051	10,051	10,051	13,036	13,036	13,036	13,036
R-squared	0.91	0.91	0.92	0.92	0.91	0.91	0.91	0.91

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Week fixed effects and Municipio fixed effects are controlled in all columns. Columns (1)–(4) include the municipios with at least one Covid-19 case at the end of Week 21, and Columns (5)–(8) include all municipios. The mean (s.d.) of Mexican social distancing in the first four columns is 0.21 (0.15), and the mean (s.d.) of the exposure to U.S. social distancing is -0.01 (1.4). The mean (s.d.) of the log cumulative cases in Mexico is 1.4 (1.8), and the mean (s.d.) of the exposure to U.S. cases is 5.1 (2.7). The corresponding numbers for the last four columns are: 0.21 (0.15), -0.1 (1.4), 1.1 (1.7), and 5.1 (2.7).

Table 4: The main results are robust to controlling for differential effects of socio-economic conditions across weeks

Variable for interaction	(1) pop. density	(2) % urban	(3) % age 16–65	(4) years edu.	(5) log income	(6) % employed
Exposure to U.S. social distancing	0.04***	0.04***	0.04***	0.04***	0.05***	0.04***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Week 10 Interaction	0.002	0.01	0.13	0.002	0.01	0.05
	(0.001)	(0.01)	(0.10)	(0.003)	(0.01)	(0.05)
Week 11 Interaction	0.003**	0.02**	0.22**	0.006**	0.03***	0.10**
	(0.001)	(0.01)	(0.09)	(0.003)	(0.01)	(0.05)
Week 12 Interaction	0.01***	0.06***	0.53***	0.01***	0.06***	0.22***
	(0.001)	(0.01)	(0.09)	(0.002)	(0.01)	(0.04)
Week 13 Interaction	0.01***	0.04***	0.64***	0.01***	0.05***	0.21***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 14 Interaction	0.01***	0.04***	0.65***	0.01***	0.04***	0.23***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 15 Interaction	0.01***	0.05***	0.69***	0.02***	0.06***	0.24***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 16 Interaction	0.01***	0.05***	0.70***	0.02***	0.05***	0.24***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 17 Interaction	0.01***	0.05***	0.73***	0.02***	0.05***	0.23***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 18 Interaction	0.01***	0.04***	0.73***	0.02***	0.05***	0.22***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 19 Interaction	0.01***	0.04***	0.89***	0.02***	0.05***	0.26***
	(0.001)	(0.01)	(0.09)	(0.002)	(0.01)	(0.04)
Week 20 Interaction	0.01***	0.05***	0.90***	0.02***	0.05***	0.25***
	(0.001)	(0.01)	(0.08)	(0.002)	(0.01)	(0.04)
Week 21 Interaction	0.01***	0.04***	0.89***	0.02***	0.04***	0.23***
	(0.001)	(0.01)	(0.09)	(0.002)	(0.01)	(0.04)
Observations	10,051	9,882	10,051	10,025	10,025	10,051
R-squared	0.92	0.91	0.92	0.92	0.91	0.92

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Municipio fixed effects are controlled in all columns. Each column replicates the regression in Table 3 and adds the interaction of a city characteristic with week fixed effects. Week 9 is the baseline week. The sample is the Week-9-to-21 panel of municipios with at least one Covid-19 case by the end of Week 21.