

# Embracing Cultural Diversity: Online Social Ties in Distributed Work Groups

Dong et al. CSCW'16

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# Overview

Diversity is shown to be beneficial in many dimensions of work (*productivity, performance, decision-making, conflict, etc.*)

How does membership in a multinational corporation affect homophily?

# Contribution

- Analysis of homophily corporate-wide vs. within workgroup networks
- Discussion of possible explanations

# Research Design

- Large Multinational Corporation
- Social Networking System (SNS)
  - Entire Corporation
  - 87 Sales Groups (2 to 1797, mean=314.5, med=166)
- Examine friendship ties between employees

	Full Network	Sales Network
<i>N(employees)</i>	588,752	22,746
<i>N(employees) (degree &gt; 0)</i>	262,806	15,602
<i>N(friendship ties)</i>	2,235,622	58,449
<i>N(countries)</i>	97	53

**Table 1: Descriptive statistics for the two networks**

# Conceptualization

Does common membership in a large global company  
reduce cultural **homophily**?

Do distributed workgroups reduce cultural **homophily**?

# Operationalization

Measure cultural diversity vs. homophily ...

... according to employee background

# Metrics

**DV:** Friendship ties (individual level friendships across corp.)

**IV:** *Huntington* Civilization, country, language, historical international alignment, religion, geographic location

**Aggregate by country, not individual-level**

# Analysis

1. Friendship Density Visualization
2. Community Detection Algorithms (Spinglass and Fastgreedy – Pairwise Rand index w/ Huntington)
3. Multiple-regression quadratic assignment procedure (MRQAP)

$$D_{ij} = \log \frac{N_{ij}}{\text{Exp}(N)_{ij}}$$



# Friendship Density

## Huntington's Civilization coloring

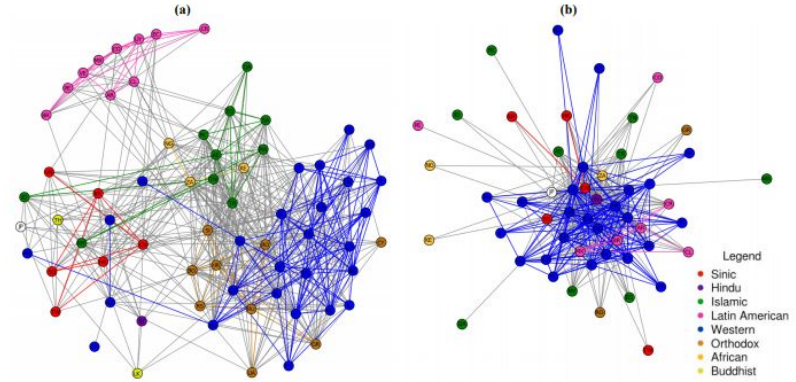


Figure 1: Between-country friendship density graphs for the full company (a) and sales group (b).

## Spinglass community detection coloring

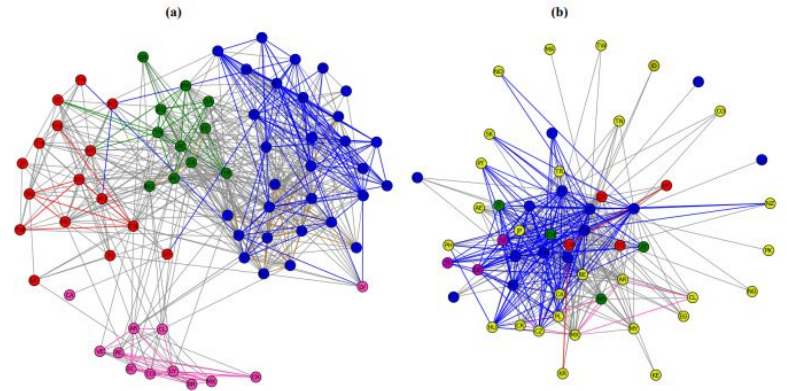


Figure 2: Between-country friendship density graphs with nodes colored based on the Spinglass community detection algorithm for the full company (a) and sales group (b).

# Community Detection

- Huntington's Framework of 8 civilizations
- Spinglass and Fastgreedy community detection alg.
- Huntington failed on sales network

	Full Network	Sales Network
Huntington - Spinglass	.739	.579
Huntington - Fastgreedy	.770	.683
Spinglass - Fastgreedy	.709	.660

Table 2: Rand index of pairwise agreement among three classifications

# Multiple-regression quadratic assignment procedure (MRQAP) Models

M0) Huntington's Common Civilization

M1) M0 + Shared Language

M2) M0 + Cultural Alignment

M3) M2 + International Alignment

M4) M3 - Common Civilization

# MRQAP Results

	Model 0	Model 1	Model 2	Model 3	Model 4
Intercept	-1.30***	-1.35***	-.71*	-.71*	-.55*
Common Civilization	.66***	.58***	.63***	.61***	
Control Variables	Cultural Alignment				
	Shared Language		.81***	.87***	.77***
	Shared Religion			.11**	.07*
	Ln Distance (km)			-.11**	-.10***
	Shared Border			.76***	.73***
	International Alignment				
	Both Western Bloc				-.42**
	Both Eastern Bloc				.25
	Both Non-Aligned Movement				1.17***
	Shared Colonial Ties				.18
Shared Commonwealth Ties				-.07	
Model Fit					
Adjusted R <sup>2</sup>	.06	.09	.16	.24	.21
F-statistics	82.05	67.65	52.51	45.55	41.27
DF	1, 1376	2, 1375	5, 1372	10, 1367	9, 1368

\*\*\*:  $p < .001$ , \*\*:  $p < .01$ , \*:  $p < .05$ , +:  $p < .10$

Table 3: Coefficients of MRQAP models predicting between country friendship density from similarity along multiple dimensions (Full Network,  $N = 53$  countries, 1378 country pairs)

	Model 0	Model 1	Model 2	Model 3	Model 4
Intercept	-.19+	-.19*	.09	.08	.04
Common Civilization	-.17*	-.17*	-.16*	-.17*	
Control Variables	Cultural Alignment				
	Shared Language		.04	.07	.11
	Shared Religion			.03	.02**
	Ln Distance (km)			-.04**	-.04+
	Shared Border			.15+	.12
	International Alignment				
	Both Western Bloc				-.13**
	Both Eastern Bloc				.56*
	Both Non-Aligned Movement				.21
	Shared Colonial Ties				.25
Shared Commonwealth Ties				-.15	
Model Fit					
Adjusted R <sup>2</sup>	.01	.01	.03	.05	.04
F-statistics	15.69	8.02	9.76	7.63	6.98
DF	1, 1376	2, 1375	5, 1372	10, 1367	9, 1368

\*\*\*:  $p < .001$ , \*\*:  $p < .01$ , \*:  $p < .05$ , +:  $p < .10$

Table 4: Coefficients of MRQAP models predicting between country friendship density from similarity along multiple dimensions (Sales network,  $N = 53$  countries, 1378 country pairs)

- For table 3 and 4, some of the values seem to be out of range for zero-order coefficients. I think the values should be between -1 and 1 inclusive. What would account for this? - Jesse
- I assume in this case that the multiple-regression quadratic assignment procedure (MRQAP) is what allows the analysis of control variables (IV) to determine the country-friendship density (DV)? - Arthur

# Arising Hypotheses

1. Due to the sales teams working on global accounts, friendship ties could be expected to include more diversity. This could explain tolerance but doesn't explain preference (*Common Civilization correlation change between analysis levels*)
2. Workgroup members have a shared interest in team success, corporations foster social ties, teammates may be motivated to improve communication
3. Corporation-level analysis doesn't give a sense of membership, while team-level does and this shared stake in performance increases employee identification with colleagues, thus fostering friendship ties

# Strengths

- Large  $N$  from corporate data
- Effective explanation of statistical results & further hypotheses
- Very good discussion and conclusion

# Weaknesses

- The limitations the authors mentioned (*at least they're cognizant of them*)
  - Only 1 Corporation
  - Lack of granularity of cultural information
- There aren't really any conclusions drawn, hence no "Conclusion" section

# Discussion Points

- The scope was very limited (1 corporation), how can they generalize these results? - *Aditi, Harish, Nina*
- There are many confounds which aren't discussed - *Harish, Sourabh*
- It could be better to study across different groups within the same company instead of just sales - *Pantea*
- Would a possible reason for the differences between the full and sales networks be personality types of members of these networks? - *Jesse*
- It would be interesting to look at a dynamic friend network – e.g. how friendship influences cooperation, how teammates can become friends - *Tengteng*
- Was there some reason the control variables in the MRQAP couldn't be used to visualize the network as done for the earlier figures? - *Arthur*