

Applying Social Network Analysis of Tweets to Compare Hispanic and Black Dementia Caregiving Networks

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Background and Aims

The prevalence of Alzheimer’s disease is higher for Hispanics and Blacks than non-Hispanic Whites.¹ Experimental evidence and social exchange theory highlights the critical role of dyad or triad friendship relations in behavioral science.² Social network analysis of online communities, Twitter³ in particular may provide insights to design culturally sensitive and customized social support interventions for Hispanic and Black family caregivers for persons with dementia. The purpose of this study is to apply social network analysis on Tweets to compare Hispanic and Black dementia caregiving networks.

Methods

- We randomly extracted Tweets mentioning dementia caregiving and its related terms from corpora collected daily via API from Sep 1 to Dec 31, 2019 (n= 549,380 English Tweets, n= 185,684 Spanish Tweets).
- We applied a Twitter bot detection algorithm to remove bot-generated Tweets followed by applying a lexicon-based demographic inference algorithm to automatically identify Tweets likely authored by Black or Hispanic individuals (n= 114,511 English, n = 1,185 Spanish).
- Last, we applied the Louvain clustering algorithm³ to detect groups within each Hispanic and Black caregiving network using Python and ORA.

Analysis

- Fourteen distinct groups (11.0%, Louvain modularity value: 0.80) were detected in the Hispanic caregiving network whereas 123 groups (7.0%, Louvain modularity value: 0.89) were found in the Black caregiving network (Table 1).

Table 1. Characteristics of Hispanic and Black dementia caregiving networks in Twitter

Level	Measure	Hispanic Dementia Caregiving Network		Black Dementia Caregiving Network	
Macro	Twitter users	409		5321	
	Density(10 ⁻⁴)	17.4		1.39	
	Links (Retweet)	291		3942	
Meso	Communities	14	11.0%	123	7.0%
Micro	Dyads	92	72.4%	1371	78.5%
	Triads	20	15.7%	182	10.4%
	Isolates		88.2%		88.9%
	Isolates	1	0.8%	70	4.0%
Total		127	100.0%	1746	100.0%

Results and Discussion

- Both networks contained a similar proportion of dyads or triads (Hispanics 88.2%, 88.9% Blacks) while the Black caregiving network included slightly larger proportion of isolates (Hispanics 0.8%, Blacks 4.0%) (figure 1).

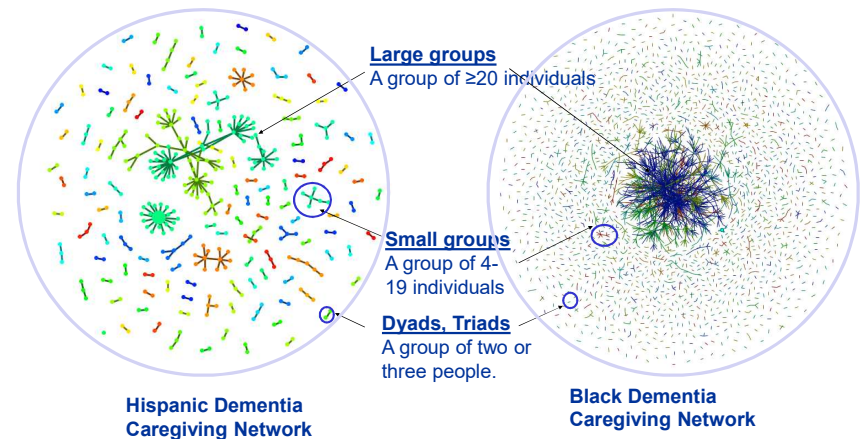


Figure 1. Social network structure of dyads, triads and communities of Hispanic and Black dementia caregiving networks

Conclusion

This study provides useful baseline information on composition of existing large groups, small groups and isolates for our future recruitment strategy and design of social support intervention for Hispanic and Black dementia caregivers.

Acknowledgments

Using Twitter to Enhance the Social Support of Hispanic and Black Dementia Caregivers (Tweet-S2) RO1AG060929

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