Predicting Tie Strength of Chinese Guanxi by Using Big Data of Social Networks

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ABSTRACT

This paper poses a question: How many types of social relations can be categorized in the Chinese context? In social networks, the calculation of tie strength can better represent the degree of intimacy of the relationship between nodes, rather than just indicating whether the link exists or not. Previou research suggests that Granovetter measures tie strength so as to distinguish strong ties from weak ties, and the Dunbar circle theory may offer a plausible approach to calculating 5 types of relations according to interaction frequency via unsupervised learning (e.g., clustering interactive data between users in Facebook and Twitter). In this paper, we differentiate the layers of an ego-centered network by measuring the different dimensions of user's online interaction data based on the Dunbar circle theory. To label the types of Chinese guanxi, we conduct a survey to collect the ground truth from the real world and link this survey data to big data collected from a widely used social network platform in China. After repeating the Dunbar experiments, we modify our computing methods and indicators computed from big data in order to have a model best fit for the ground truth. At the same time, a comprehensive set of effective predictors are selected to have a dialogue with existing theories of tie strength. Eventually, by combining Guanxi theory with Dunbar circle studies, four types of guanxi are found to represent a four-layer model of a Chinese ego-centered network.

KEYWORDS

tie strength, Dunbar circle theory, Chinese Guanxi theory, supervised classification model, social network

G uanxi theory proposed three principles for the Chinese social interactions, i.e., rules of needs, favor ocial-exchange principles to categorize the types of guanxi that actually exist. Big data helps to address this challenging question. This paper tries to combine the surveyed data with big data collected from Software A —one of the most widely used social-network platforms in China. Reviewing social network theory, Granovetter classified tie strength into two categories including strong and weak ties. Foremost, his studies on weak ties, which can bring heterogeneity information and opportunity, have generated significant impact and have been widely applied in a variety of areas. In addition, Granovetter also pointed out that tie strength could affect the flow of information and the logic of interaction between people. However, in his work, there is no specific method, mathematically, to indicate whether an exact boundary exists between strong and weak ties. Based on his work, many researchers developed practicable methods to measure tie. However, most of the follow-up works focused on the indicators which were highly correlated with tie strength respecting continuum of intimacy, interaction frequency, reciprocity, and friendship duration, rather than distinguishing strong ties from weak ties. It is also well known that the Dunbar circle suggested a five-category model of social relations as a plausible solution for measuring tie strength, which defined five specific circles,

having a clear boundary between two contingent circles. In contrast to the Western counterparts, within the Chinese social context, "a relationship is a guanxi tie to the extent that trust is high and relatively independent of social structure around the

The trust in guanxi can be built on family ethics ,

1 This is the First Section

argued that Chinese society is "family-ethics based", since the social-exchange principles in guanxi were transformed from family ethics and could be applied to persons outside family. Fei referred this phenomenon as "the differential modes of association", that is, a Chinese divides his/her ego-centered network into several circles and applies different social-exchange principles to the contacts in various circles. The requirement of family ethics decreases from inner to outside circles. In addition, the closer a person to the centered ego is, the more independent their guanxi to network structure is. In other words, the impacts of structural variables,

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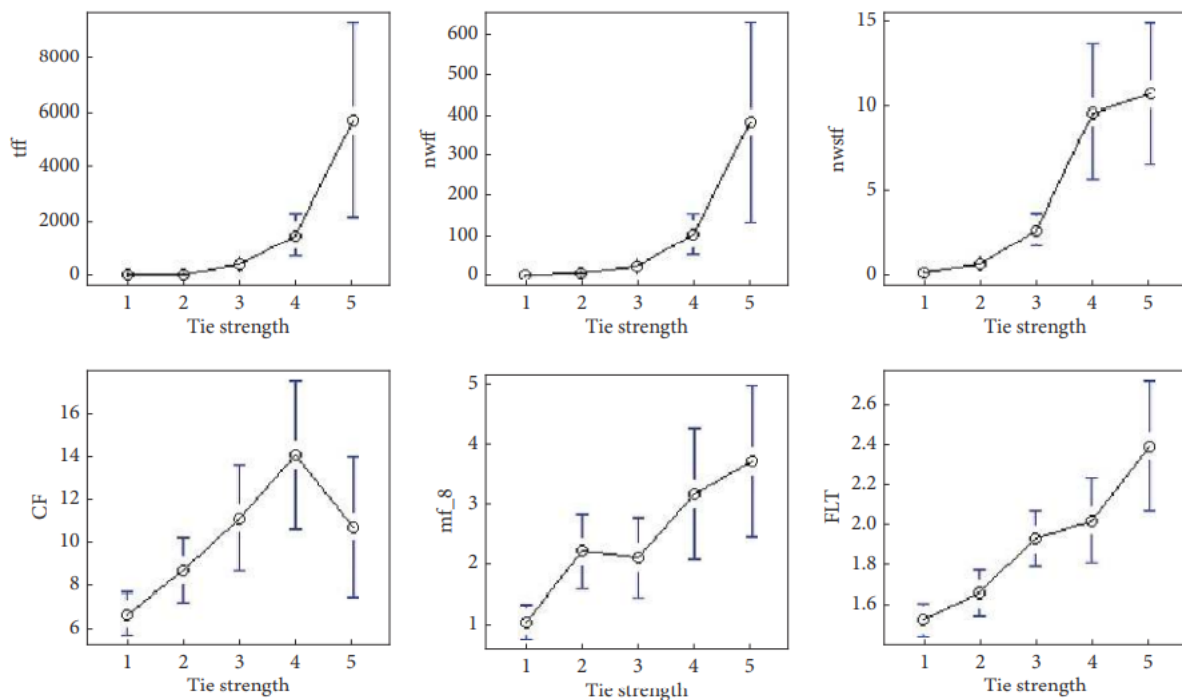

Fig. 1 Long Figure 1145141919810

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Table 1 Add caption

Layer	tff	nwff	nwstf	FLT	mf_8	cf
1	2	3	4	5.5	6	66
333	444	555	2	1.1	1	1
665	886	1107	0	-3.3	-4	-64
997	1328	1659	-2	-7.7	-9	-129
1329	1770	2211	-4	-12.1	-14	-194
1661	2212	2763	-6	-16.5	-19	-259
1993	2654	3315	-8	-20.9	-24	-324
2325	3096	3867	-10	-25.3	-29	-389
2657	3538	4419	-12	-29.7	-34	-454
2989	3980	4971	-14	-34.1	-39	-519

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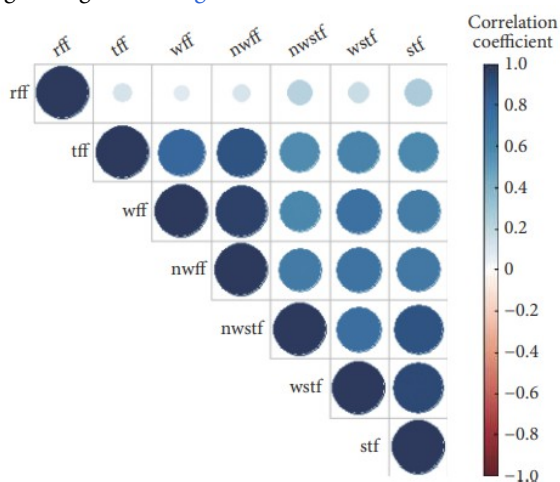

Fig. 2 This is the Figure

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