



Impacts of Social Network on Therapeutic Community Participation: A Follow-up Survey of Data Gathered after Ya'an Earthquake

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Abstract

Background: In recent years, natural disasters and the accompanying health risks have become more frequent, and rehabilitation work has become an important part of government performance. On one hand, social networks play an important role in participants' therapeutic community participation and physical & mental recovery. On the other hand, therapeutic communities with widespread participation can also contribute to community recovery after disaster.

Methods: This paper described a field study in an earthquake-stricken area of Ya'an. A set of 3-stage follow-up data was obtained concerning with the villagers' participation in therapeutic community, social network status, demographic background, and other factors. The Hierarchical linear Model (HLM) method was used to investigate the determinants of social network on therapeutic community participation.

Results: First, social networks have significantly impacts on the annual changes of therapeutic community participation. Second, there were obvious differences in education between groups mobilized by the self-organization and local government. However, they all exerted the mobilization force through the acquaintance networks. Third, local cadre networks of villagers could negatively influence the activities of self-organized therapeutic community, while with positively influence in government-organized therapeutic activities.

Conclusion: This paper suggests that relevant government departments need to focus more on the reconstruction and cultivation of villagers' social network and social capital in the process of post-disaster recovery. These findings contribute to better understandings of how social networks influence therapeutic community participation, and what role local government can play in post-disaster recovery and public health improvement after natural disasters.

Keywords: Social network, Therapeutic community participation, Local government, Self-organization

Introduction

The frequency of natural disasters and their resulting losses have increased annually in China in recent years, and post-disaster recovery has become an unavoidable problem to government and the affected people. Data from the survey conducted in our study after Ya'an Earthquake indicates that 40.2% of villagers participate in self-organized therapeutic activities, 16.1% in government-organized therapeutic activities, and only 3.1% in both, and victims in the disasters are mobilized by different types of organizations: self-organized and

government-organized. Governments, Non-Governmental Organizations (NGOs), and people' self-organizations all play important roles in this complicated process (1). Because the degree of therapeutic community participation affects post-disaster recovery profoundly, building therapeutic communities can improve victims' mental health and help them return to productivity and normality (2). On one hand, according to the conversation of resource theory (COR), both material and non-material resources have significant influence on

victims' mental health (3-4). So the investigation of influencing factors on it would provide great practical significance and theoretical value. Fortunately, Social networks can be a vital social resource for victims and help their physical and mental recovery. On the other hand, the Chinese governments at all levels can quickly assemble considerable relief supplies and social resources after disasters, making them the dominant source of earthquake relief management. However, many research find that victims often tend to seek assistance from their social networks (relatives, neighbors, friends, etc.). Instead of governments, these networks play a key role in helping victims return to normal life (5), also as shown in our survey above. Natural disasters frequently lead to failures in formal systems because of their tremendous destructive force (6). However, "informal" social network and relationships can help to control the failures and provide relief to the victims (7). A questionnaire survey of this study indicated that villagers participating in self-organized activities rarely took part in local government-organized activities, and vice versa. This demonstrates that there are segregations in groups participating in post-disaster recovery activities. It is therefore important to consider how informal systems and social networks motivates members of society to involve themselves in post-disaster recovery activities, what the differences between mobilizations from private and government sources are, and how social network and local governments influence therapeutic community participation. This paper will address these questions using quantitative data.

Research hypothesis

Paul Samuel regarded community participation as a positive social process in which social members interacted with each other, involved themselves in community affairs, and tried to solve public issues and problems. It used the bottom-up operational logic adopted by grassroots organizations rather than the logic used by governments (8). Some researchers put particular emphasis on leaders' roles and others focused on members' socio-economic backgrounds (9).

With the development of "social capital" theory, many scholars begin to study the impact factors of therapeutic community participation from the perspectives of social capital and social network. Broadly speaking, social capital refers to social networks that could cultivate collective action, share goals, and facilitate reciprocity. Putnam deemed social capital (contained with network, trust, and norms) as the characteristic of social life. It motivated effective cooperation and common goals (10). This kind of network, based on reciprocity and trust, is crucial to therapeutic community participation in the process of post-disaster recovery.

As Quarantelli (11) pointed out, some researchers emphasized the importance of formal systems to post-disaster recovery. In the face of natural disasters, victims might sink into huge fear, and they can do nothing but wait helplessly for rescue, completely dependent on orders provided by governments (12). This viewpoint has caused researchers more focus on governments' role in post-disaster recovery, such as the ways in which governments mobilize social resources and the targeted assistance mode of reconstruction among local governments, which are generally called as state-centered disaster studies .

Society's initiative operation and community's self-organizations are just as important to post-disaster recovery as formal systems are. As reported in the Patterson study on Hurricane Katrina, social networks within the Jewish community in the South Lewis Anna area were of such great size and density that the residents were able to rebuild the stricken area quickly (13). Nagakawa and Shaw studied a Kobe earthquake response and found that informal systems such as interpersonal networks played an important role in post-disaster reconstruction (14). A community with high cohesion and affluent relations could be organized to rebuild by its members in the absence of governmental resources and support. These kinds of recovery activities can be considered as therapeutic community activities (15). Based on theoretical analysis and field observation, the following hypothesis was established:

Hypothesis 1-1: The size of villagers' social networks positively influences their therapeutic participation in self-organization.

If someone's social network has more strong ties, then it is considered as a close, dense network (16), in which it can produce informal common norms with higher constraints. That is to say, community members know each other well, supervise each other, and engage in collective actions easily. Members can be easily supervised and punished if they transgress norms (17). With reference to previous research results, this paper defined "strong tie" as villagers' relationships among relatives and friends. Social networks with large numbers of strong ties here referred to relatively close networks of relatives-friends network, that is to say, a social network with high density, great restraining force and mobilized power (18). The following hypothesis was established:

Hypothesis 1-2: The proportion of strong ties (proportion of relatives and friends) in villagers' social networks positively influences their therapeutic participation in self-organization.

Data analysis shows that the annual changes in community participation are positively influenced by China's rapid economic, which increase people's standards of living and benefits improvement (19). However, so far, there have been few empirical studies that discuss this from the perspective of social networking. As already noted, social networks involve pronounced restraining force on its members. So we hypothesized that:

Hypothesis 1-3: The size and proportion of strong ties (proportion of relatives and friends) in villagers' social networks significantly influences their annual changes in therapeutic participation in self-organization.

Regarding the relevant topics about therapeutic participation, western academia primarily concerns whether the trust structures of community members tend to be strong or weak, whether their social capital tends to be bonding social capital or bridging social capital (20). But it is more fundamental for Chinese rural community that local government affects communities directly and

deeply. So far few empirical studies have investigated how local governments affect therapeutic community participation. This paper attempts to study the topic. Ching-Ping Tang conducted a field study in a Taiwan community after Chi-Chi earthquake, and found that government's supports on post-disaster reconstruction and community development might lead to unintended consequences (21). That is, networks connected by community members and government officials, may restrain therapeutic self-organizations formed by reciprocity and identity, so as to restrain voluntary actions. It was also noted that villagers acquainted with more officials at and above the township-level prefer government-organized activities to self-organized activities in the field observation of Ya'an. This paper expected that the following hypothesis could be supported by statistical analysis:

Hypothesis 2-1: Villagers' networks with local cadres (size and proportion of relatives-friends) negatively influence their participation in activities of self-organized therapeutic community.

The relationship in the strength of a social network governs its ability of mobilization. A villager with more strong official ties is likely to be mobilized by local government to participate in government-organized activities. So this paper proposed the following hypothesis:

Hypothesis 2-2: Villagers' networks with local cadres (size and proportion of relatives-friends) influence their participation in government-organized therapeutic activities.

following the logic of above analysis, the following hypothesis was established:

Hypothesis 2-3: Villagers' networks with local cadres (size and proportion of relatives-friends) positively influence their annual changes in participation in government-organized therapeutic activities.

we established a theoretical framework below by synthesizing the aforementioned literature reviews on social networks and community participation, shown in Fig.1.

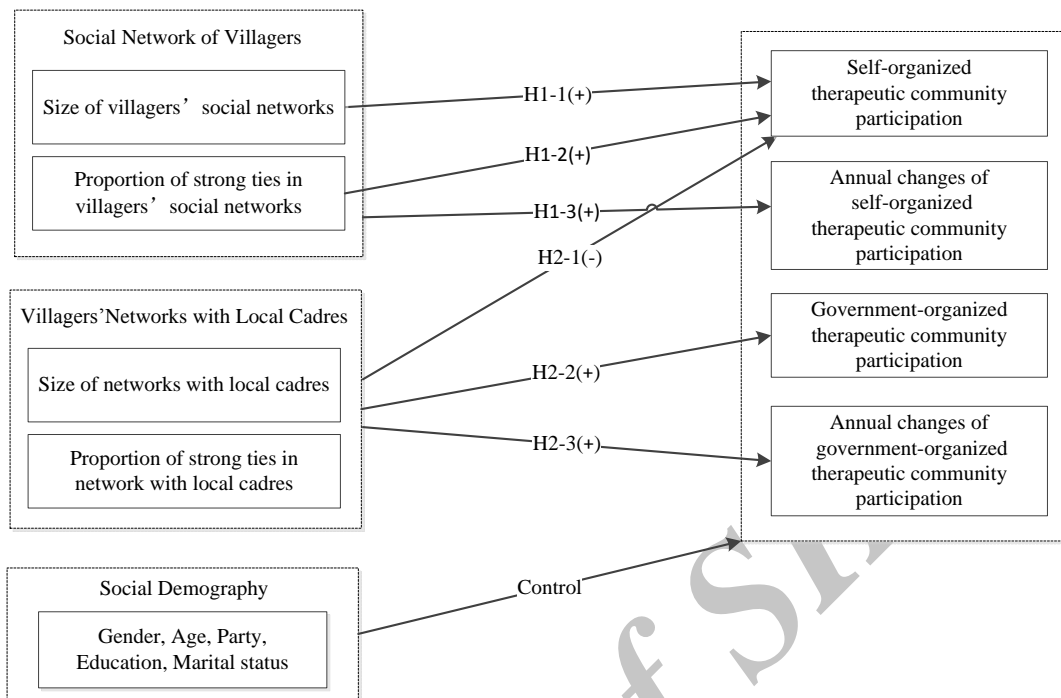


Fig. 1: A theoretical framework for explaining the influence of social networks on therapeutic community participation

Materials and Methods

Data Collection

On April 20th 2013, a 7 magnitude earthquake hit Ya'an City of Sichuan Province in Southwest China at a depth of around 12 kilometers. 196 people were killed, 11470 people were injured, and more than 1500000 people were affected. Electricity and water supplies were interrupted, roads were blocked. Many earthquake-induced secondary disasters such as bad weather, powerful aftershocks, and landslides were triggered. We conducted 3 follow-up surveys in the earthquake-stricken area of Ya'an, forming a set of 3-staged follow-up data. The first survey in August 2013 did not use the method of probability proportional sampling (PPS) because of objective condition limit, but picked up 10 villages by Judgmental Sampling Method, then took out 20 households randomly in each village and adopted the Kish table to select 1 adult in each household to fill out the questionnaire. A total of 183 valid responses were received in the first survey with a valid response rate of 91.5 percent. The second

(December 2013) and third (May 2014) were follow-up surveys. Not only the family-level data of villagers was collected, but also the relevant data of the social network of villagers was obtained during the survey.

Research Variables

1) Dependent variables

This paper focused on the factors affecting activities of the community participation in post-disaster recovery, especially considering the role of existing social network and local government. "Therapeutic community participation" here was defined as follows: public and mutual-aid activities such as mental comforting, community environment cleanup, community patrol, material transportation, and caring for the old and children. A series of question items aiming at measuring therapeutic community participation were designed. This technique required interviewees to evaluate a set of questions using a 5-level option with the value of 1-5. For purpose of quantitative analysis, factor analysis was carried out with method of principal component analysis, and we

got two factors of “therapeutic community participation” in each survey. Table 1 is the result of factor analysis in the first survey. As we can see from it, the “therapeutic community participation” can be divided into two factors (Cronbach’s Alpha: 0.823): “factor of self-organized therapeutic community participation” informing the situation and degree of villages’ participation in self-organizations; “factor of government-organ-

ized therapeutic community participation” informing an equivalent of villages’ participation in government-organized activities.

The two factors were treated as dependent variables, and converted to percentage variables on a scale of 1 to 100 in this paper, in order to reflect the influence of independent variables on dependent variables directly.

Table 1: Factor analysis of therapeutic community participation (August 2013)

Question items	factor of self-organized therapeutic community participation	factor of government-organized therapeutic community participation
1. I always take part in government-organized therapeutic community activities.	.019	.923
2. I will encourage friends and relatives to participate in government-organized therapeutic community activities.	.114	.882
2. I should take the responsibilities and obligations to participate in government-organized therapeutic community activities.	.256	.882
4. I always take part in self-organized therapeutic community activities.	.871	.119
5. I will encourage friends and relatives to participate in self-organized therapeutic community activities.	.941	.087
6. I am really proud of participating in self-organization.	.922	.065
% of Variance	54.134	29.876

Extraction Method: Principle Component Analysis

Rotation Method: Varimax with Kaiser Normalization

2) Independent variables

This paper took social networks as independent variables. Generally speaking, social networks involve two kinds of relationships: expressive relation and instrumental relationships (22). Because local governments are a vital factor that cannot to be neglected in the Chinese contexts, so the questionnaire designed three kinds of social networks of villagers: instrumental relation network, expressive relation network and network with local cadres, which were measured by Name Generator Method. Namely, instrumental relation network was measured by inquiring villagers about the relevant information of the people who assisted them after the earthquake (such as lending money or things, helping farm work or house construction), expressive relation network

inquiring about the relevant information of the people with deep personal friendship, network with local cadres inquiring about the relevant information of the rural cadres on friendly terms. Based on the analysis above, we calculated the size of the three networks separately: number of net-involved members, proportion of strong ties (relatives and friends).

3) Control variables

To clarify the effect of social networks on the activities of villagers’ therapeutic community participation, this paper introduced some characteristic variables as control variables (i.e. gender, age, party, education, and marital status) (Table 2).

Table 2: Variable Description

Name	Means	Standard deviation	variable declaration
Dependent variables			
self-organized therapeutic community participation	63.232	(40.165)	Interval Scale, factor score by percentages
government-organized therapeutic community participation	29.193	(31.542)	Interval Scale, factor score by percentages
Social network			
Size of instrumental relation network (size1)	5.182	(6.157)	Interval scale, number of net-involved members
Proportion of strong ties in instrumental relation networks (strong ties1)	.742	(.353)	Interval scale, percentage of “relatives and friends” in network, 0-1, “1” means all relatives and friends in network
Size of expressive relation network (size2)	2.654	(1.873)	Interval Scale, number of net-involved members
Proportion of strong ties in expressive relation network (strong ties2)	.787	(.412)	Interval scale, percentage of “relatives and friends” in network, 0-1, “1” means all relatives and friends in network
Size of networks with local cadres (at and above the township-level)/ (size3)	.752	(1.866)	Interval Scale, number of net-involved members
Proportion of strong ties in network with local cadres (strong ties3)	.231	(.412)	Interval Scale, percentage of “relatives and friends” in network, 0-1, “1” means all relatives and friends in network
Control variables			
Gender	.413	(.512)	Dichotomous variable, 0=male, 1=female
Age	48.123	(16.592)	Interval Scale
Party	.043	(.218)	Dichotomous variable, 0= non-party, 1=part
Education	6.328	(3.542)	Interval scale
Marital status	.782	(.187)	Dichotomous variable, 0= unmarried, 1= married or divorced or widowed

Hierarchical Linear Model

The basic premise of classic linear regression based on least square method (OLS) is that the error distribution should be normal, independent and identically distributed. But the data collected in the paper are follow-up data coming from several investigations to the same respondents. Therefore, the classic linear regression model is not appropriate for data analysis in this paper. In fact our follow-up data can be regarded as the data with nested structure, namely measuring data nested in individuals, as a result of similarity existing in the same individual's yearly

measurements formed by the same sample (23). Hierarchical linear models (HLMs) were chosen for data analysis.

Here an unconditional growth model, called Model 1, was established to measure the factor “self-organized community participation”. The dependent variable Y_i stands for the score (percentage) of villagers' self-organized participation, time stands for three surveys with values of 1, 2, and 3. Unconditional growth model is a special type of HLM for its removal of any variables except time. It is mainly used for

investigation in subjects' variation tendency, as well as their variability.

Concrete model is shown as follows:

Model 1 (unconditional growth model)

Level 1:

$$Y_1 = \beta_0 + \beta_1 \times time + r$$

Level 2:

$$\beta_0 = \gamma_{00} + \mu_0, \beta_1 = \gamma_{10} + \mu_1$$

Model 2 is established based on Model 1, as a result of independent variables introduced. It was developed to probe the influences between independent variables and dependent variables (β_0), and the annual changes among dependent variables (β_1).

Gender, age, education, party, and marital status were here introduced as control variables. The size and proportion of strong ties for the three kinds of networks (i.e. instrumental relation network, expressive relation network and network with local cadres at and above the township-level) were introduced as independent variables.

Model 2:

Level 1:

$$Y_1 = \beta_0 + \beta_1 \times time + r$$

Level 2:

$$\beta_0 = \gamma_{00} + \gamma_{01} \times gender + \gamma_{02} \times age + \gamma_{03} \times party + \gamma_{04} \times edu + \gamma_{05} \times marriage + \gamma_{06} \times size1 + \gamma_{07} \times strongtie1 + \gamma_{08} \times size2 + \gamma_{09} \times strongtie2 + \gamma_{10} \times ssize3 + \gamma_{11} \times strongtie3 + \mu_0$$

$$\beta_1 = \gamma_{10} + \gamma_{11} \times size1 + \gamma_{12} \times strongtie2 + \gamma_{13} \times size2 + \gamma_{14} \times strongtie2 + \gamma_{15} \times size3 + \gamma_{16} \times strongtie3 + \mu_1$$

To measure the factor "government-organized community participation", dependent variable Y_2 which means score (percentage) of villagers' government-organized participation was introduced. The establishment principle and process of Model 3 and Model 4 are the same as those of Model 1 and Model 2, so the details of Model 3 and Model 4 are not shown here.

Results

Social networks have significantly impact on the annual changes of therapeutic community participation

Model 1 and Model 3 in Table 3 show that these two intercepts ($\gamma_{00}=23.345$, in Model 1; $\gamma_{00}=21.439$, in Model 3), are significantly higher than zero ($P<0.001$). This indicates that community participation obviously varies within a survey. Similarly, the values of τ_{11} are significantly higher than zero ($P<0.001$), indicating that community participation varies widely among different survey times.

Model 2 and Model 4 in Table 4 illustrate a clear correlativity between social networks and the changes of therapeutic community participation over time. It can be seen from Model 4 that the proportion of strong ties in the network with local cadres (at and above the township-level) has the positive influence on government-organized therapeutic community participation ($\gamma_{16}=2.631$), while with the negative influence on the participation of self-organized therapeutic community ($\gamma_{16}=-1.498$) which is also presented in Model 2.

There are considerable differences in education between groups mobilized by self-organization and local government

In Model 4, the education positively influences activities of the therapeutic community organized by local governments ($\gamma_{04}=1.475$, $P<0.001$) with statistical significance. While it is not significantly correlated with self-organized therapeutic activities ($\gamma_{04}=1.238$, in Model 2). Besides, social networks usually have considerably differences between the two kinds of mobilizations. Local governments tend to mobilize villagers with longer education time who also possess a dense and intimate network with local cadres ($\gamma_{011}=1.842$, $P<0.001$, in Model 4).

Table 3: Results of hierarchical regression analysis for therapeutic community participation (Model 1 & Model 3, N=453)

Variable	Model 1 Self-organized	Model 3 Government-organized
Fixed Effect (β_0)		
Intercept (γ_{00})	23.345**(2.221)	21.439**(2.219)
Fixed Effect (β_1) Time		
Intercept (γ_{10})	4.479**(1.009)	3.714**(0.927)
Random Effect (variance components)		
Means of community participation degree (τ_{10})	43.261***	45.564***
time (τ_{11})	12.432**	13.398**
level-1 r	213.691	209.593
Model deviance	1243.432	1266.653

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$ Two-tailed test; Standard errors are shown in parentheses

Table 4: Results of hierarchical regression analysis for therapeutic community participation (Model 2 & Model 4, N=453)

Variables	Model 2 Self-organized	Model 4 Government-organized
Control Variable		
Gender (1 = female) (γ_{01})	-1.452(3.876)	-0.945(1.492)
Age (γ_{02})	0.212(0.115)	0.165(0.176)
Party (1 = yes) (γ_{03})	0.935(2.872)	0.683(1.754)
Education (γ_{04})	1.238(2.478)	1.475*(0.577)
Marital status (γ_{05})	0.945(0.976)	1.036(1.254)
Fixed Effect (β_0)		
Size of instrumental relation network (γ_{06})	-1.974(2.946)	1.652(1.542)
Proportion of strong ties in instrumental relation network (γ_{07})	1.398*(0.625)	2.322*(0.862)
Size of expressive relation network (γ_{08})	3.512(4.585)	1.832(1.656)
Proportion of strong ties in expressive relation network (γ_{09})	2.321**(0.387)	2.456**(0.831)
Size of networks with local cadres (at and above the township-level) (γ_{010})	-1.219**(0.524)	4.654**(1.393)
Proportion of strong ties in network with local cadres (at and above the township-level) (γ_{011})	-1.753**(0.652)	1.842**(0.367)
Fixed Effect (β_1) Time		
Size of instrumental relation network (γ_{11})	0.158(0.381)	0.287(0.367)
Proportion of strong ties in instrumental relation network (γ_{12})	1.276*(0.619)	1.652*(0.634)
Size of expressive relation network (γ_{13})	0.212(0.215)	0.432(0.521)
Proportion of strong ties in expressive relation network (γ_{14})	5.312*(1.231)	4.734**(1.374)
Size of networks with local cadres (at and above the township-level) (γ_{15})	0.566(0.387)	0.545(0.764)
Proportion of strong ties in network with local cadres (at and above the township-level) (γ_{16})	-1.498**(0.512)	2.631**(0.984)

* $P < 0.05$ ** $P < 0.01$ *** $P < 0.001$. Two-tailed test; Standard errors are shown in parentheses

Both self-organizations and governments mobilize villagers through acquaintance networks

Model 2 illustrates two positive regression coefficients ($\gamma_{07}=1.398$, $\gamma_{09}=2.321$, with statistical significance) in variables proportion of strong ties for both instrumental relation network and expressive relation network correlated with self-organized therapeutic activities, which support the hypothesis 1-2. It suggests that self-organization events are mainly driven by instrumental relation network and expressive relation network. In addition, the above two variables that positively influence villagers' participation in government-organized activities ($\gamma_{07}=2.322$, $\gamma_{09}=2.456$, in Model 4), with statistical significance, show that the mobilization mechanisms of both self-organizations and governments work through acquaintance network. Furthermore, the two variables also significantly influence the annual changes of therapeutic participation in self-organization ($\gamma_{12}=1.276$, $\gamma_{14}=5.312$, $P<0.001$, in Model 2; $\gamma_{12}=1.652$, $\gamma_{14}=4.734$, significant, in Model 4), while the effects of the network size variables are not statistically significant ($\gamma_{11}=0.158$, $\gamma_{13}=0.212$, in Model 2; $\gamma_{11}=0.287$, $\gamma_{13}=0.432$, in Model 4). This means hypothesis 1-3 is partially authenticated.

Additionally, the network size variable (including the instrumental relation network and expressive relation network) has no significantly influence on activities of self-organized therapeutic community ($\gamma_{06}=-1.974$, $\gamma_{08}=3.512$, not significant, in Model 2) therefore hypothesis 1-1 fails to find support from the data analysis. Similarly, the network size variable (including the instrumental relation network and expressive relation network) has no significantly influence on government-organized therapeutic activities ($\gamma_{06}=1.652$, $\gamma_{08}=1.832$, not significant, in Model 4). This indicates that expansion of networks may result in a decline of the scale of mobilizations and the level of influences. Dense networks still play important role in mobilizing villagers.

Local cadre networks of villagers negatively influence the activities of self-organized therapeutic community, while with positively influence in government-organized therapeutic activities.

We can also find in Table 4 that the negative regression coefficient of the size of networks with local cadres is significant ($\gamma_{010}=-1.219$, in Model 2) when it is correlated with self-organized activities. That means a villager with a higher number of officials in his/her social networks is less inclined to participate in therapeutic community activities. In contrast, it positively influences the participation in therapeutic activities organized by the government ($\gamma_{010}=4.654$, in Model 4), with statistical significance. It appears that size of networks with local cadres works differently in self-organized therapeutic activities and government-organized therapeutic activities.

The proportion of strong ties in networks with local cadres also positively influences government-organized therapeutic activities ($\gamma_{011}=1.842$, $P<0.001$, in Model 4), with statistical significance. It is illustrated that the mobilization of local governments exerts its function through networks with local cadres, and the stronger the ties are in it, the better the scale of the mobilization is. However, this variable shares a negative relationship with self-organized therapeutic activities ($\gamma_{011}=-1.753$, $P<0.001$, in Model 2). Overall, villagers' networks with local cadres (size and proportion of strong ties) positively correlate with government-organized therapeutic activities, while negatively correlate to self-organized therapeutic activities. So hypothesis 2-1 and hypothesis 2-2 proposed in the paper are authenticated.

Lastly, in Model 4, we can find that, factor "proportion of strong ties in network with local cadres" (at and above the township-level) positively influence their annual changes in participation in government-organized therapeutic activities ($\gamma_{16}=2.631$, $P<0.001$), but the result of the size of network with local cadres indicates that it is not statistically significant ($\gamma_{15}=0.545$). So we can conclude that hypothesis 2-3 is partially authenticated here.

Discussions

According to relevant studies in Western academia, the length of education is directly proportional to the degree of community participation. That is to say, the longer the education lasts, the broader the social network is and the richer the social capital is, which also means easier integration into community life and higher participation in community activities (24–25). However, the quantitative analysis in this paper found different social facts: the education only positively influenced therapeutic community activities organized by local governments with statistical significance, which indicated that villagers with higher social status tended to participate in government-organized therapeutic activities, who also regarded them as an access and a chance to gain more social resources.

Additionally, statistical results of this paper showed that the “disaster-affected subjects” (i.e. self-organizations and governments) and their social networks had different relationships to therapeutic community participation. But as stated at the beginning, previous studies just deemed the social network as a key factor in post-disaster recovery, lacking social contextual discussions. So this paper introduced the variable “villagers’ networks with local cadres” which is a crucial element in Chinese context. Statistical analysis showed there to be markedly visible segregations in the groups mobilized by the local government and self-organized therapeutic community, which represents the diversity of villagers’ social network. It also suggests that the heterogeneity of social networks will certainly bring higher participation degree of therapeutic community.

Last but not least, we must pointed that, besides official rescues, many administrators and researchers of China have realized the importance of unofficial rescues in the specific practice of coping with natural disaster in recent years. However, as one of the important resources responding to natural disasters, the role of social networks in the relief and recovery of the physical & mental recovery of disaster-affected people

hasn’t been fully explored in Chinese context, as can be seen from the analysis result above. So more essential efforts should be emphasized in this area from both theoretical and practical level.

Conclusion

Based on the analysis conducted in this paper, we find that the local government mobilize villagers by their networks with cadres, which is similar to self-organizations, the common characteristics of them is via acquaintances’ networks with rare usage of the executive power of bureaucracies. However, there still exists the segregation between the two kinds of mobilizations, and the post-disaster recovery activities they dominate are mutually exclusive. This shows that local government plays an important role in post-disaster recovery and the improvement of victims’ mental health, although they have negative impacts on the activities of self-organized therapeutic community at the same time. These results remind us that we need to pay more attention to the social relationships of the “disaster-affected subjects” and the structure of social networks.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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References

1. Ibañez GE, Khatchikian N, Buck CA, Weisshaar DL, Abush-Kirsh T, Lavizzo EA, Norris FH (2003). Qualitative analysis of social support and conflict among Mexican and Mexican-American disaster survivors. *J Community Psychol*, 31(1): 1-23.
2. Kaniasty K and Norris F (2004). Social support in the aftermath of disasters, catastrophes, and acts of terrorism. In *Bioterrorism: Psychological and Public Health Interventions*. Eds, Ursano R et al. 1st ed, Cambridge University Press, Cambridge, pp. 200-229.
3. Hobfoll S (1989). Conservation of resources: A new attempt at conceptualizing stress. *Am Psychol*, 44(3): 513-24.
4. Freedy JR, Saladin ME, Kilpatrick DG, Resnick HS, Saunders BE (1994). Understanding acute psychological distress following natural disaster. *J Trauma Stress*, 7(2): 257-73.
5. Day JM (2014). Fostering emergent resilience: the complex adaptive supply network of disaster relief. *Int J Prod Res*, 52(7): 1970-88.
6. Johnston D, Becker J, Paton D (2012). Multi-agency community engagement during disaster recovery: lessons from two New Zealand earthquake events. *Disast Prev Manag*, 21(2): 252-68.
7. White JH, Miller B, Magin P, Attia J, Sturm J, Pollock M (2012). Access and participation in the community: a prospective qualitative study of driving post-stroke. *Disabil Rehabil*, 34(10): 831-8.
8. Talò C, Mannarini T, Rochira A (2014). Sense of community and community participation: a meta-analytic review. *Soc Indic Res*, 117(1): 1-28.
9. Chen J, Chen THY, Vertinsky I, Yumagulova L, Park C (2013). Public-private partnerships for the development of disaster resilient communities. *J Conting Crisis Manag*, 21(3): 130-43.
10. Putnam RD (1995). Tuning in, tuning out: The strange disappearance of social capital in America. *Ps-Polit Sci Polit*, 28(4): 664-83.
11. Quarantelli EL (1989). Conceptualizing disaster from a sociological perspective. *Int J Mass Emerg Disasters*, 7(3): 243-51.
12. Ireni-Saban L (2012). Challenging disaster administration: Toward community-based disaster resilience. *Admin Soc*, 45(6): 651-73.
13. Patterson O, Weil F, Patel K (2010). The role of community in disaster response: conceptual models. *Popul Res Policy Rev*, 29(2): 127-41.
14. Nakagawa Y, Shaw R (2004). Social capital: a missing link to disaster recovery. *Int J Mass Emerg Disasters*, 22(1): 5-34.
15. Rice ME, Harris GT, Cormier CA (1992). An evaluation of a maximum security therapeutic community for psychopaths and other mentally disordered offenders. *Law Human Behav*, 16(4): 399-412.
16. Granovetter MS (1973). The strength of weak ties. *Am J Sociol*, 78(6):1360-80.
17. Vasavada T (2013). Managing disaster networks in India: a study of structure and effectiveness. *Public Manag Rev*, 15(3): 363-82.
18. Elizabeth B, Spillius EB, eds. (2001). *Family and social network: Roles, norms and external relationships in ordinary urban families*. 3rd ed. Routledge, New York, pp. 213-216.
19. Wang ZX (2005). Before the emergence of critical citizens: economic development and political trust in China. *Int Rev Sociol*, 15(1): 55-171.
20. Poortinga W (2012). Community resilience and health: The role of bonding, bridging, and linking aspects of social capital. *Health Place*, 18(2): 286-95.
21. Tang CP, Tang SY (2014). Managing incentive dynamics for collaborative governance in land and ecological conservation. *Public Admin Rev*, 74(2): 220-31.
22. Hwang K (1987). Face and favor: The Chinese power game. *Am J Sociol*, 92(4): 944-74.
23. Kreft IGG, Kreft I, Leeuw J (1998). *Introducing multilevel modeling*. 1st ed. Sage Publications, London, pp. 153-157.
24. Kirkby-Geddes E, King N, Bravington A (2013). Social capital and community group participation: examining “bridging” and “bonding” in the context of a healthy living center in the UK. *J Community Appl Soc Psychol*, 23(4): 271-85.
25. Burt RS, Kilduff M, Tasselli S (2013). Social network analysis: foundations and frontiers on advantage. *Annu Rev Psychol*, 64: 527-47.