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PERSONAL NETWORKS AND SOCIAL SUPPORT IN DISASTER CONTEXTS

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ABSTRACT

In this study we analyze the effects of post disaster personal networks in the provision of social support among victims of natural disasters. We developed an ex post facto study based on data collected from ninety-four flood victims in Colombia and performed a multiple regression analysis in which three forms of social support (emotional, instrumental, informative) were used as response variables, while data corresponding to the structure and composition of post disaster personal networks operated as predictor variables. Results revealed that density and betweenness of personal networks affect the provision of emotional and informative support in disaster contexts.

INTRODUCTION

Society has always been required to cope with natural disasters. It is estimated that by 2030, 50% of the world's population will live at least 100 kilometers from a coast (Small & Nicholls, 2003) been exposed to extreme meteorological conditions and, consequently, to natural disasters. In Colombia, humanitarian assistance has frequently been provided for victims of disasters caused by extreme weather conditions. Between 2010 and 2011, this country faced one of the greatest natural disasters in national history when floods affected 3.893.087 people and 33 regions. Particularly, in the region of Atlántico, 110.202 people became homeless (High Council for Region & Citizen Participation, 2011).

Flooding displaces entire populations whose social systems are consequently disrupted. Therefore, in addition to the need for geographical relocation, flooding also creates the need for psychosocial readaptation and disrupts victim's personal networks (Benítez et al., 2004). Victims lose their connections within their native social system in a context where social support could

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not normally be achieved by acting independently and face the immediate need to rebuild their personal networks for their recovery and relief (Provan & Kenis, 2008).

We understand personal networks as the relations emerging from particular situations of everyday life. Such relations form a variety of ties with different types of alters (social contacts), who serve different purposes for ego (the network owner) by providing different social resources (Granovetter, 1973). From this perspective, personal networks are often constrained by structural realities and the resources those structures make available. Therefore, Social Network Analysis (SNA) can be a fruitful tool for examining not only the personal network's structure and composition (Wasserman & Faust, 1994) but also for illustrating the role of networks in providing social support. The structure and composition of post disasters personal networks have been widely revised (Kaniasty & Norris, 1993; Norris et al., 2005; Kaniasty & Norris, 2008; Forgette et al., 2009). However, the identification of specific support mechanisms facilitated by these networks in the immediate aftermath of disasters has yet to be extensively explored.

METHOD

This study has two purposes. The first is to explain the characteristics of the structure and composition of post-disaster personal networks and the perception of social support among the victims of natural disasters. The second is to show in what way the structure and composition of post-disaster personal networks influence the perception of social support in the immediate aftermath of a disaster. For this, we developed an ex post facto study based on data collected from ninety-four flood victims in Colombia and performed a multiple regression analysis.

Participants

We selected the participants by identifying actors directly affected by floods in Colombia in 2010, who were homeless, living in temporal community shelters and who agreed to voluntarily take part in the study. Once identified, we asked the ninety-four participants to sign the Inform Consent Letter by which they were informed about the research background, procedure, risks, benefits and the confidentiality agreement according to which the information will be kept confidential except in cases where the researchers were legally obligated to report specific psychosocial risks.

Instruments

For the sociodemographic information we used a questionnaire where the participants informed about their age, gender, birthplace, occupation, education level and civil status. For the information about post-disaster personal networks and social support, we used a semi-structured interview divided in three sections: the first generates the master list of social support ties; the second identifies the list with social ties that did not necessarily provide any form of support but were considered part of the network; the third rates the influence of such ties in the network.

To generate the master list, we used the Arizona Social Support Interview Schedule (ASSIS) (Barrera, 1980) as a name generator. The ASSIS facilitated the identification of support

resources by collecting data about six mechanisms of social support: a) expression of personal issues; b) material help; c) advice; d) feedback; e) physical assistance and f) social participation. Each participant generated a list of between 5 and 15 names of actors who provided them with social support. The ninety-four participants named 30 alters. Finally, for the influence rating, participants indicated if the nodes or members of their network knew each other (on a scale of 0 to 1 where 0 was *do not know each other* and 1 was *do know each other*)

Data Analysis

We constructed 94 matrices of post disaster personal networks with a total of 2.820 unique pair of relations. With these matrices we developed a Social Network Analysis (SNA) using UCINET (Borgatti et al., 2002). We focused on the following indicators: density, centralization, degree and betweenness. These indicators have been widely used to study the structure of social networks (Freeman, 1979; Wellman, 1979; Fischer, 1982; Burt, 1984; Campbell & Lee, 1991; Kapucu et al., 2009; McCarty, 2002). Density measures the level of connectivity in the network considering the percent of ties out of all possible ties. Centralization indicates how the relationships of the network cluster around a few well-positioned actors, who are the ones who control the flow of information. Degree identifies how well-connected is an actor to other actors in the network, indicating where the most activity in the network occurs. Finally, we used betweenness to measure the extent to which an actor serves as a bridge between other actors, playing the role of mediator.

To identify the social support perception, we focused on the information obtained with the ASSIS and used SPSS. The Pearson's correlation coefficient illustrated the associations between the mechanisms of social support and the structure and composition of post-disaster personal networks. Finally, we performed a multiple regression analysis in which the three forms of social support (emotional, instrumental and informative) were used as response variables and the data corresponding to the structure and composition of the networks operated as predictor variables. The findings are organized in two sections. In the first section we present the findings of post-disaster personal networks analysis and social support. In the second we explain the way the structure and composition of post disaster personal networks influence the provision of social support.

RESULTS

Post-Disaster Personal Networks

Results showed that post disaster personal networks had a heterogeneous composition since they were integrated by alters with different relations to the ego and from different places of origin. The networks were primarily composed by family members, followed by neighbors, friends and acquaintances. The networks showed a tendency to have a higher proportion of female (70.4%) than male alters (29.6%), with females almost tripling the number of males. The results also reveal a preference for local contacts and few ties with external contacts (see table 1).

Table 1
Composition of personal networks.

Indicators of composition	f	%	Average	SD	Min	Max
Relationship of alters						
Partner / husband / wife / de facto	62	2.20	0.7	0.48		
Number of family members	1209	42.87	13.0	5.96	0	29
Number of friends	488	17.30	5.2	5.66	0	28
Number of acquaintances	187	6.63	2.0	4.47	0	22
Number of neighbors	868	30.78	9.2	7.06	0	25
Number of other individuals	6	0.21	0.1	0.29	0	2
Place of residence of alters						
Number of residents from the community	2504	88.79	26.6	4.54	6	30
Number of residents not from the community	316	11.21	3.3	4.55	0	24
Gender of alters						
Number of men	835	29.6	8.9	3.65	0	17
Number of women	1985	70.4	21.1	3.65	13	30

The data describing the structural properties of the networks are presented in table 2. Here, each property is divided into percentiles to show the distribution of the data.

Table 2.
Structural indicators of personal networks

Descriptive		Degree	Betweenness	Density	Centralization
Average		85.81	0.50	0.86	14.37
SD		15.35	0.55	0.15	15.31
Percentage	25 (low)	76.82	0.00	0.80	0.50
	50 (medium)	90	0.35	0.90	10.35
	75 (high)	99.50	0.80	1.00	23.42

Note: the levels of the indicators are high (above 75 percent), medium (above 50 percent) or low (25 percent)

The structure of post-disaster personal networks demonstrated moderate connectivity (medium density=58.5%; low density=42.5%) and low levels of direct contacts (high degree=26%; medium degree=22%; low degree=46%). However, actors in the network were moderately likely to act as intermediaries between other actors (high betweenness=28.7%; medium=33%; low=38.3%). A moderate trend was also identified in the levels of centralization. This result suggests that social control and participation were dispersed throughout the structure and popular members who centralized the flow of relationships were less prominent (high centralization=33%; medium=33%; low=34%). Finally, with a greater number of acquaintances demonstrated higher levels of betweenness (r=0.534) and centralization (r=0.453) and reduced levels of degree (r=-0.517) and density (r=-0.488).

Post-Disaster Social Support

The results showed that disaster victims experienced reduced levels of social support. Of the 2.820 alters in the 94 networks studied, only 35.2% provided support to the ego. The most frequent form of received social support was emotional support, which was experienced by 24.6% of participants. The most common support mechanisms reported here was social participation (13.2%), followed by the intimate act of being able to share private feelings (11.4%). Informative support was the second most frequent form of support received, occurring among 19% of the sample. Most of those who received informative support were offered advice (11.09%) or positive reinforcement (7.87%). These two elements were the least common modes of support offered in the networks analyzed. Instrumental support had the lowest frequency among members of the networks. The most frequent mechanisms of instrumental support received was material support (10.46%), followed by physical assistance (7.87%), which was the second-least reported form of support.

Post-Disaster Personal Networks and Social Support

The participation of family members in an individual's network was associated with higher levels of advice (r=0.240, p<0.05), positive feedback (r=0.242, p<0.05) and social participation (r=0.368, p<0.01). In addition, inverse associations were observed between the number of alters living in the same community affected by the disaster and the opportunities they had to share private feelings (r=-0.203, p<0.05) and advice (r=-0.261, p<0.05), receive positive feedback (r=-0.344, p<0.01) and physical help (r=-0.298, p<0.01) and engage in social participation (r=-0.269, p<0.01). In contrast, if a victim's network included a higher number of alters living outside of the community, victims experienced each of the described support mechanisms to a greater degree, obtaining identical but positive values.

The indicators of social support were crossed with the indicators of structure and composition of the networks. This information appears in table 3, which shows that density presents inverse associations with positive feedback (p<0.05), advice (p<0.05), social participation (p<0.01) and private feelings (p<0.01). Degree also presents inverse associations with advice (p<0.01), social participation (p<0.01) and private feelings (p<0.01). Conversely, betweenness and centralization were positively associated with positive feedback, advice and private feelings (p<0.05).

Table 3.
Pearson's correlation coefficient of structural indicators and social support in the analyzed support networks.

Form of support	Betweenness	Density	Centralization	Degree
Positive Feedback	0.208*	-0.245*	0.222*	-0.166
Material Help	0.151	-0.178	0.158	-0.154
Advice	0.230*	-0.252*	0.249*	-.233[*]
Social Participation	0.158	-0.210*	0.156	-.257[*]
Physical Assistance	0.042	-0.055	-0.020	-0.049
Private Feelings	0.250*	-0.277*	0.259*	-.247[*]

Note: *p=0.05

Finally, to examine whether the variables that expressed significant correlations with the perceived mechanisms of social support can predict the degree of emotional, instrumental and informative support received by victims, we performed a multiple linear regression analysis for each of these variables (see table 4). The results reveal that emotional support is inversely predicted by density while informative support is inversely predicted by density and betweenness. The results didn't show significant predictors regarding instrumental support.

Table 4
Significant predictors of the regression results for social support

| Predictor variables | Summary of the models | | | ANOVA | Coefficients | |
	R^2 corrected	Change in R^2	Durbin-Watson	F*	β	t*
[a] Density	,107	,116	1,701	12,089	-,341	-3,477
[b] Density	,064	,074	1,403	7,378	-,272	-2,716
Betweenness	,095	,040	1,403	4,153	-1,128	-2,038

[a] Regression model for emotional support;
[b] Regression model for informative support; * $p<0,05$.

CONCLUSION

Adversity negatively influences a group's social development, which can lead to a reduction in the size of social networks and the availability of social support resources. In emergency situations, the networks that compose the social structure are placed under immense pressure. This strain weakens certain ties, affecting relationships that typically provide companionship, emotional support, cognitive guidance, social regulation, material help and access to new contacts within the network (Oliver-Smith, 1996). This leads to a state of crisis that endangers individuals' psychosocial identity and their ability to functionally adapt to the consequences of the natural disaster.

In this study, the post-disaster network structures performed moderately in the indicators for interaction and social relationships. The results for all of the structural indicators analyzed oscillated between low or moderate levels, suggesting that victims experienced less control over their relationships and were less able to expand their social ties and exert social influence. Previously, Varda and colleagues (2009) have shown that interactive networks typically become less socially permeable under disaster conditions. This result was confirmed by the structural reality of the personal networks identified in our study, which showed low levels of connectivity that belied the distance of the interactions. Additionally, there were few central or popular figures acting as preferential objects for social exchanges within the networks.

Notably, at the compositional level, close family members have higher values in the provision of social support, which reaffirms the importance of relatives in the constitution of personal

networks (Ayuso, 2012; Cox, 2005; Molina, 2005). Previous studies have shown that despite the decreasing network diversity caused by natural disasters, family relationships remain stable (Varda et al., 2009). The conceptualization of relationships through interactions with close relatives is a logical coping strategy. It allows members to be added to a victim's network through the development of strong ties with individuals who have a high level of personal and geographical closeness to them. Social ties among relatives are fostered in an environment of trust, and the provision of support, which includes immediate support in times of need, becomes natural in a family context (Lin, 2001).

The characteristics of family relationships therefore become essential under circumstances in which material and psychosocial needs require effective, practical and timely responses. In summary, the post-disaster personal networks studied revealed a relationship pattern characterized by an intensified integration of family members. A disadvantage of networks characterized by this preference for nearby social actors is that network members experience difficulty accessing support resources beyond those offered by family and close friends (Molina et al., 2005). This reality is experienced in all the networks analyzed in this study, as indicated by the low levels of psychosocial support which was received only by 35.2% of the participants. The overview of social support coincides with reports of Karlin and colleagues (2012) who also found a reduced flow of supportive behavior. Although a wide range of resources were available, participants perceived these as insufficient. Because of the scarcity of other types of support, emotional support appears to acquire the utmost importance to disaster victims. This highlights the importance of offering opportunities to participate in relationship-based structures such as personal intimacy.

Finally, these study shows two important findings. First, networks with social bridges and external relationships, have more opportunities to receive positive feedback and advice and to express and liberate emotions. Second, weak ties, far from creating alienation, seem to be vital for victims' recovery and relief in the immediate aftermath of a disaster. As Granovetter (1973) has pointed out, in this study we found that individuals with few weak ties are deprived of information from distant parts of the social system and are confined to the local news and views of their close friends. This deprivation puts them in a disadvantaged position in society and makes them unlikely to mobilize effectively for collective action within their communities (Gans, 1961).

The results highlight the importance Social Network Analysis (SNA) in researching disaster recovery and relief. We found that the possibilities offered by contact with external actors can facilitate interactive mobility between individuals and positively affect the way in which these networks are composed and their ability to intensify relationships with support providers. These positive changes can subsequently increase the availability and effectiveness of diverse forms of humanitarian assistance.

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