

Social Capital and Individual Well-being in the Post-Disaster Period: The case of Hurricane Maria in Puerto Rico

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Introduction

Puerto Rico was affected by Hurricane Maria in September 2017, an event that caused extensive human and material losses (Rudner, 2018). It has been one of the most destructive disasters in the island's history, and its consequences were felt for months after the hurricane passed (Pasch et al., 2019). Rudner (2018) states that “the storm was immense, perhaps the largest recorded, with 150 mph winds and 30 inches of rain”. Despite the devastation caused by the hurricane, the response of the US federal government was qualified as untimely and sometimes inadequate, resulting in a slow mobilization of resources to support victims (Rodríguez-Díaz, 2018). Within this context, community-level actions from the civil society were necessary to restore normalcy and improve the well-being of their communities (Rudner, 2018). Such processes of cooperative behavior emerged from social capital elements, for instance, participation in groups, social trust, and shared values, which provide community responses to address common challenges and enhance individual well-being (Delilah Roque et al., 2020).

There is an increasing interest in social capital research published in the disaster studies literature so far, as the interaction between individuals through social organizations to achieve common objectives leads to benefits for individuals and groups (Putnam, 2000). Researchers have found different effects and complex relationships between disasters and social capital (Akbar & Aldrich, 2018; Carlin et al., 2014; Hommerich, 2012; Nicholls & Picou, 2013; Toya & Skidmore, 2014). Much less attention has been paid into whether changes in the evaluation of subjective well-being (SWB) could be associated with different forms of social capital (SC) such as social trust, social connections, and volunteering in the aftermath of disasters.

This study is focused on addressing the following questions: Did social capital influence the individual SWB after Hurricane Maria in Puerto Rico? If so, what kind of social capital was related to individual well-being? The study employs an instrumental variable (IV) approach to estimate the effect of each social capital variable on individual well-being, addressing various econometrics issues. Given the complexity of the concept of social capital, our approach provides a rigorous empirical analysis of its influence on SWB after a disaster. To summarize, we find out that building social bonds, and belonging to social groups increases the individual subjective well-being (SWB). However, we found that trust in government harmed the individual's SWB. We argue that the absence of a timely federal government response, and the consequent lack of support for the local governments to lead recovery efforts, might explain why mistrust was linked to individual well-being in the aftermath of Maria.

Context

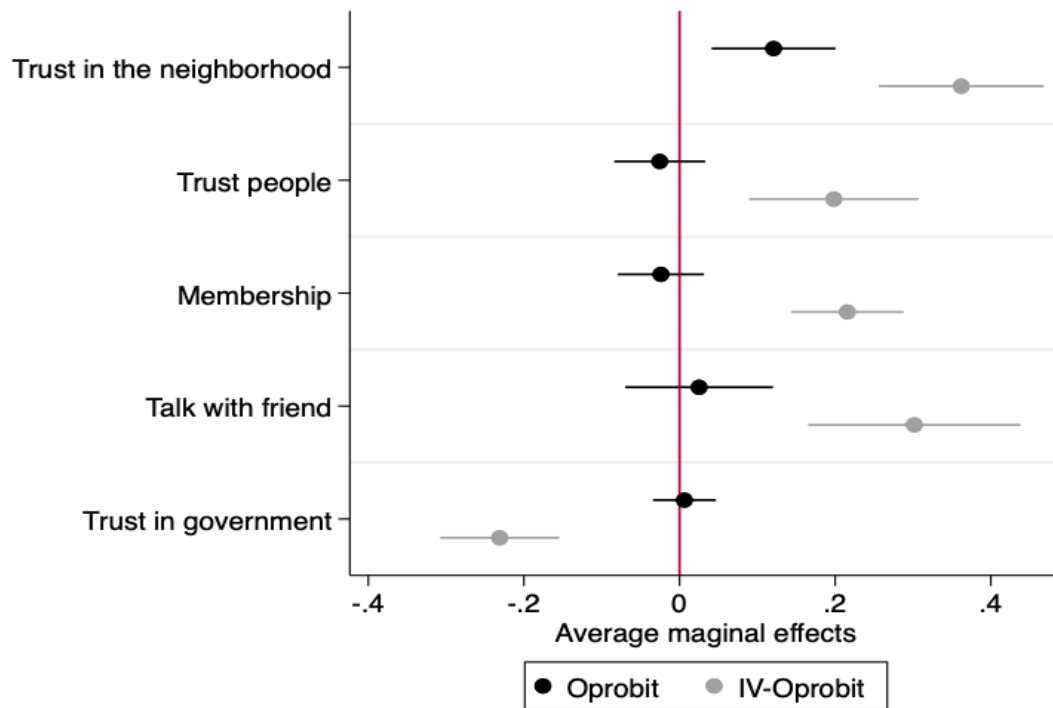
Hurricane Maria was a Category 5 Atlantic hurricane that caused widespread damage, destruction, and loss of life in the Caribbean in 2017, hitting the island of Puerto Rico particularly hard (Kishore et al., 2018; Zorrilla, 2017). The social consequences of the hurricane were severe and far-reaching, both journalistic and academic research have examined a number of different aspects of these consequences in the past years (Straub, 2021).

Some research has found that the hurricane exacerbated pre-existing social inequalities and led to conflicts over resources and aid (Lloréns, 2018; Straub, 2021). Additionally, the hurricane may have exacerbated preexisting issues or tensions within the government and society, which could have further damaged social trust (Joseph et al., 2020; Rodríguez-Díaz, 2018). There have also been studies on the social and political consequences of the hurricane, including its impact on social relations, community resilience, and the response of government and other organizations (Andrade et al., 2023; Delilah Roque et al., 2020; Rodríguez-Díaz, 2018; Rosas et al., 2021).

Results and discussion

The results (see Figure 1 below) show a positive and significant association between trust in neighbors and SWB. The estimated average marginal effect increased from 12.1 percentage points to 36.2 percentage points, which indicates that correcting for endogeneity increased the probability of respondents reporting being very satisfied with life when people trust their neighbors. Similarly, trusting people you know personally was found to increase the likelihood of being very satisfied with life by 19.8 percentage points after correcting for endogeneity. Talking with friends and being an active member of organizations were also positively and significantly linked to self-reported life satisfaction, increasing the probability of being very satisfied with life by 30.2 and 21.6 percentage points, respectively. However, trust in government was found to have a negative and significant effect on well-being. After addressing endogeneity, the average marginal effect decreased from 0.6 percentage points to -23.1 percentage points, meaning that individuals who trust the government are less likely to report high levels of life satisfaction.

Figure 1. Marginal effects. Ordered Probit and IV-Ordered Probit models on the probability of being very satisfied with life.



Estimates correspond to the average marginal change across observations using Ordered Probit and IV-Ordered Probit models on the probability of SWB = 5. Standard error for the average marginal changes were computed by Delta Method. We draw 95% confidence intervals.

According to Akbar and Aldrich (2018), disaster recovery is the final stage of disaster management, and life satisfaction is a crucial component of recovery. Then, any component of social capital related to individual SWB has important implications for individual and community resilience. This research finds that the impact of social capital on well-being is diverse, similarly Villalonga-Olives and Kawachi (2017) point out that social capital can have both positive and negative impacts on well-being. The results showed that bonding and bridging social capital had a positive and statistically significant effect on self-reported life satisfaction. On the other hand, linking social capital, measured as trust in government, had a negative and significant impact. Furthermore, other determinants were found, such as self-reported health, age, education, marital status, household income, and the presence of disaster recovery centers in a municipality. These findings are relevant because they confirm that social capital can act as a protective buffer for well-being in the aftermath of a disaster, but it can also have adverse effects on SWB.

Our first findings indicate that in post-disaster period, individuals find support from informal social ties like friends, neighbors, and membership in organizations as a source of well-being. These findings are supported by the studies of Kuroki (2011), who found that trust in people has a positive effect on happiness in Japan, and Hommerich (2012), who analyzed the impact of the 2011 earthquake in Japan on individual well-being and found that trust in friends and neighbors positively contributes to SWB and helps individuals cope with disasters. Furthermore, the study by Okuyama and Inaba (2017) highlights that daily interaction with neighbors and friends positively relates to life satisfaction in communities affected by the earthquake, reinforcing the positive impact of both bonding and bridging social capital. One possible explanation is that social connections and social trust are a source of solidarity, cooperative behavior, and altruism following disasters, which are important elements to foster community resilience (Aldrich et al., 2015).

On the other hand, the negative effect of linking social capital, trust in the government, on well-being is in line with literature. Nicholls and Picou (2013) found that disaster victims' prospects for recovery were related to trust in the government. In addition, the researchers found that people who were exposed to the adverse effects of Hurricane Katrina tended to report lower levels of trust in federal or central government agencies, taking into account a negative perception of governmental performance post-disaster period. In Puerto Rico, two factors contributed to a slower disaster recovery. Firstly, the US government's response could have been inadequate and delayed, resulting in a slow mobilization of resources to support the victims (Benach et al., 2019; Rodríguez-Díaz, 2018). Secondly, Benach et al. (2019) argued that the hurricane exposed and reinforced long-standing socio-economic vulnerabilities on the island. As a result, these conditions create distrust in government, as pointed out by Miller and Rivera (2011).

Conclusions

Although undesirable and tragic, the aftermath of Hurricane Maria in Puerto Rico has offered a unique opportunity to study the role of social capital on subjective well-being. The storm caused significant human and material losses and is considered the most catastrophic event in the island's history (Pasch et al., 2019; Rudner, 2018). This study explored the relationship between social capital and individual life satisfaction in the aftermath of the hurricane. Using data from the World Values Survey (WVS) wave 7 and the Puerto Rico Statistics Institute, we employ an instrumental variable approach to rigorously address this relationship, finding positive impacts on bridging and bonding social capital, while the linking component, associated with government trust, showed a negative relationship with life satisfaction. This study makes a contribution to the literature by providing empirical evidence of the role of social capital on individual well-being. To our knowledge, this is the first article that studies the empirical relationship between these variables in the context of Hurricane Maria.

The policy implications from our findings are threefold. First, we highlight that timely responses from governments and institutions could make a huge difference in well-being for affected populations. As we have shown with our results, trust in government is negatively associated with well-being impacts. In other words, we could say that trusting an ineffective

government made people unhappier. Appropriate and timely crisis responses, good governance, and proper disaster risk reduction (DRR) planning practices are all policies that would avoid scenarios of mistrust and state capacity erosion (Carlin et al., 2014; Fuentealba et al., 2020).

Secondly, our results highlight the question of who would benefit from these insights and results, and how to improve well-being in increasingly hazardous scenarios. We argue that policymakers should not overlook well-being impacts for affected populations, as their assessment could be effectively used to quantify impacts with valuation techniques (Ahumada & Iturra, 2021; Luechinger & Raschky, 2009; Sarrias & Jara, 2020). Jensen and Tiwari (2021) argue that these estimates make the total costs of disasters much higher than traditional direct valuation techniques. Quantifying well-being after disasters with better individual data that includes post-traumatic, depression, and complete SWB scales, could be used as a policy tool to focus resources where they are most needed. As a corollary, this data availability could also be used to tailor appropriate evidence-based policies as part of DRR planning for future emergencies, enhancing the interactions between hazards, institutions and governance (Jensen & Tiwari, 2021).

Finally, we highlight the importance of grassroots community efforts and the social capital they provide, since our results confirm that bonding and bridging SC show a positive relationship with SWB, as opposed to the linking component. Fostering weak ties within and between communities could enhance generalized trust (Glanville & Paxton, 2007), leading to the development of cooperative behaviors and social identities. This process can bring resource management capacity (Diani, 2015; Espinoza, 1999), which is absolutely critical in the context of post-disaster scenarios. In addition, it is widely known that local finances, austerity policies and state governance have been a controversial issue for this territory in the last century (Benach et al., 2019; Rodríguez-Díaz, 2018). Our policy recommendations are in line with Rosas et al. 2021, where municipal capacity for community involvement could be a crucial and more attainable way of bringing both parts of social capital together, increasing resilience and preparedness, avoiding potential traps such as the excessive bureaucratization, interference with community efforts, archaic rules, and organizational inflexibilities (Manandhar et al., 2022).

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