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Beyond social capital: The norms, belief systems, and agency embedded in social networks shape resilience to climatic and geophysical hazards

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ABSTRACT

Theory suggests that social capital should moderate the impacts of climatic and geophysical hazards and shape adaptive capacities and recovery trajectories, yet the empirical evidence is more mixed than commonly supposed. In short, there is a non-monotonic relationship between social capital and disaster resilience: but what are the reasons for this? We first relate this mixed evidence to the "dark side" of social capital, including bonding capital that is cemented by ethnic hostility, patronage networks, "unresponsive" linking capital, and the conservative nature of social capital. We then argue that the scale-dependent, geographic extent, and *placed* nature of social networks play a critical and oft neglected role in shaping resilience. We turn to discuss the importance of the resources embedded within social networks (financial and human capital), as well as the *content* of the norms, social memories, and belief systems that are propagated across networks. Network functions – in terms of which goals social networks are directed towards, and the specific resources they bring to bear on them - are then discussed. To conclude we suggest that moving beyond social capital towards a combined focus on the structure, geography and content of social networks offers a promising direction in theorising and analysing resilience.

1. Introduction

An influential school of thought hypothesizes that social capital - broadly defined as a measure of the strength and density of network relations - moderates the impacts of climatic and geophysical hazards and shapes adaptive capacities and recovery trajectories, even after adjusting for age, gender, and socioeconomic factors (*e.g.* Klinenberg, 2015; Aldrich, 2011, 2012; Adger, 2003; Burton and Kates, 1963; Turner et al., 1986; Smith, 1981; Sadri et al., 2018). There is a large body of both case studies and quantitative analyses that provide support this hypothesis. However, there is also a significant amount of variation in effect sizes, as well as a non-trivial amount of null-findings (*e.g.* Browning et al., 2006), along with some results suggesting that social capital may in some contexts actually *undermine* resilience (*e.g.* Aldrich, 2011; Wolf et al., 2010). This paper is motivated by a desire to systematically explore the sources and nature of this heterogeneity. Its point of departure is that variation in empirical results often indicates problems with how we theorise and analyse a phenomenon, rather than merely reflecting noise or random variation.

To state that the body of literature on social capital and resilience contains some conflicting results is not novel. Indeed there has long been a (sometimes reluctant) acceptance within the field that social capital has a "dark side," meaning that social relations can be used to advance private or sectarian interests at the expense of the public good (Aldrich, 2011; Pelling, 1998). Moreover, it is widely acknowledged that context matters, in the sense that whether social capital contributes to resilience depends on various background variables or dimensions of context (Pelling and High, 2005; Adger, 2003). However, much of the discussion of the dark side of social capital draws from research undertaken in fields other than disaster resilience (*e.g.* organised crime). Moreover, the recognition that context matters often takes the form of ad hoc qualifiers (see also Fine, 2003), with the exception of well-established variables such as state-society relations and the nature of reciprocal relations (Pelling and High, 2005; Adger, 2003). To be sure, context matters, but which dimensions of context influence the operation of social capital, and through which mechanisms? We lack a conceptually oriented synthesis of these drivers of heterogeneity. This not only constrains theoretical development, but also limits the capacity of the field to offer coherent, credible policy advice. Policy makers and authoritative institutions have taken increased interest in social capital over the past 10–15 years, with the World Bank notably promoting it as *essential* for sustainability, resilience, and poverty reduction (Bebbington et al., 2006) (Table 1 sets out the potential policy implications of a link between social capital and resilience). In the absence of a systematic understanding of the mixed results in the scientific literature, there is a danger that the simplified view that social capital is monotonically related to resilience becomes embedded within public discourse and thereby distorts rather than informs policy making. The rapid expansion of empirical work in the field since the seminal theoretical contributions of Adger (2003) and Pelling and High (2005) makes now a good time to take stock of developments and further refine theory. Moreover, this paper's combined focus on climatic and

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Table 1
Potential policy implications of social capital's contribution to hazard resilience.

Variations in social capital serve as an important proxy for social vulnerability, and thereby could be used as a basis for prioritising state and transnational efforts in poverty alleviation and economic development, and also as a basis for directing emergency response and recovery efforts post-disaster (Pelling and High, 2005).
The inverse correlation between levels of social capital and mental health outcomes (e.g. PTSD) in post-disaster settings implies that where resettlement is required, policy makers should attempt to maintain community links as far as is possible (Hikichi et al., 2017).
Policy makers should make efforts to build social capital within communities so as to build resilience, for example through providing funding, facilitators and arenas for collaboration between diverse actors and institutions across multiple scales ("boundary-spanning networks") (Bodin and Crona, 2009; Schneider et al., 2003).
Policy makers should be careful not to suppress social capital, *e.g.* through being tolerant of civil society organisations and non-state modes of governance (many scholars are sceptical whether the state can directly build social capital through interventions, but they accept that they can (inadvertently) suppress it) (Adger, 2003).

geophysical hazards seeks to add value through cross-fertilising ideas across two research communities that have tended to operate relatively independently.

This paper draws on the published empirical literature, both qualitative and quantitative, to advance the following research aims:

1) Identify the variables that moderate whether social capital contributes to resilience to climatic and geophysical hazards, and
2) Provide a taxonomy of these variables within the broad framework of social network theories

The latter aim is motivated by the desire to maintain parsimony, as social capital is fundamentally a theory of the nature and operation of *social networks* (although the latter encompasses more than the former).

The paper proceeds as follows. Section 2 provides an overview of the concept of social capital: what it constitutes, how it is measured, and the mechanisms through which it influences resilience (also defined in this section). Section 3 aims to explain the non-monotonic relationship between social capital and hazard resilience. It identifies the variables that moderate whether social capital contributes to disaster resilience. Section 4 summarises the analysis and offers implications for theory and policy. The basic argument is that the variables identified in Section 3 are not an *ad hoc* list of effect modifiers. Instead, those variables are either consistent with more theoretically refined treatments of social capital,[1] or are attributes of resources embedded in network nodes (*e.g.* human and financial capital), or are things that are propagated and shared across network relations (*e.g.* norms, social memories, perceived collective efficacy), or relate to particular network functions. This suggests that a combined focus on the structure and content of social networks offers great promise for theorising and analysing the social dimensions of resilience.

2. Social capital and resilience: concepts, measurement, and mechanisms

The term social capital may have been coined relatively recently but the core underlying ideas are almost as old as social science itself, namely that:

1) Actors have the capacity to secure benefits by virtue of their membership and position within social networks (Portes, 1998), and
2) Trust, reciprocity and shared norms are prerequisites for collective action which can overcome social dilemmas and achieve mutually beneficial outcomes (Putnam et al., 1994).

Recent decades have seen a proliferation of work on social capital, with something approaching a consensus emerging that it refers to the relative strength and density of ties between individuals, as well as associated network characteristics such as trust, reciprocity, and the depth of shared norms (Putnam, 2004; Woolcock, 2001; Szreter and Woolcock, 2004). Scholars vary in terms of whether they conceive of social capital as a property of groups or as an attribute of individuals *and* the networks in which they are embedded (Kiwachi et al., 2008; Lin, 1999). A related debate is whether social capital is best measured at the individual or aggregate level;[2] the prevailing view is that both approaches are valid, and the choice should be determined by one's research questions (Kiwachi et al., 2008). A word on how social networks are commonly conceived. The predominant conception is of networks as pipes (Podolny, 2001) that link actors *via* flows of knowledge, information and other kinds of resources. Another important concept emphasises the deliberative character of networks and by extension their role in facilitating coordination and collective action (Rockenbauch and Sakdapolrak, 2017).

The measurement of social capital is challenging and contested. Whilst social capital is fundamentally a theory of social networks, empirical work in the field has not widely adopted the standardised measures of social network analysis (SNA) (*e.g.* measures of reachability, density, and modularity; Bodin et al., 2006; Janssen et al., 2006). This is despite the fact that both social capital and SNA researchers take many of the same network constructs as their focus, *e.g.* the number and strength of network ties, the degree of cohesion, and subgroup inter-linkages (Bodin and Crona, 2009). One reason for this may be that whilst social capital theorists and social network analysts both start from the broad premise that people are social animals and that networking affects social outcomes, SNA researchers do not necessarily make the normative assumptions that social capital researchers tend to adopt (Davies, 2011) – focussing instead on *describing* patterns in network relations - nor do they pay special attention to trust and norm-sharing. Notable exceptions include Burt (2000) and Lin (1999) - social capital researchers that work squarely within the formal traditions of social network analysis - although their analytical approach has had little influence on scholars working on hazard resilience. This lack of influence may be rooted in pragmatism: research focussed on quantifying social capital's role in moderating hazard impacts and shaping recovery trajectories is naturally conducted in the aftermath of an event, and as such typically relies on the retrospective development of various proxy measures from archives, census data, or highly aggregated survey measures.

A consequence of the above is that social capital researchers have yet to reach consensus on questions of variable selection and weighting schemes, nor on the extent and process by which measurement should be tailored to fit distinct cultural and geographical contexts (Woolcock and Narayan, 2000; Aldrich and Meyer, 2014; De Silva and Harpham, 2007; Agampodi et al., 2015). Commonly used individual-level survey measures include perceptions of trust, reciprocity, social control, civic participation, as well as intensity, duration, and frequency of network interaction. However, the standard measures of perceived trust have been critiqued for being weakly informative of trust-related *behaviour* in both laboratory and real-world settings (*e.g.* willingness to loan possessions; Glaeser et al., 2000; Bowles and Gintis, 2002). A plethora of community-level measures have been used in ecological studies, from blood donation levels to charitable contributions to church membership. However, concerns have been raised about the extent to which they represent the construct of interest (*e.g.* perhaps regular church attendance implies acceptance of strong ethical constraints on

[1] Albeit rarely incorporated within measurement frameworks.

[2] In other words, is social capital is a collective attribute, or are its benefits associated with individuals and their social relationships (Poortinga, 2006).