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Review

Can the social mechanisms framework be applicable in modeling natural shocks?

Roland Azibo Balgah

Post doctoral fellow, Bamenda University of Science and Technology in collaboration with the Military University – Munich and the University of Hohenheim, Germany.
Lecturer, University of Bamenda and the Pan African Institute for Development – West Africa, Buea – Cameroon.
P.O.Box 5044 Nkwen – Bamenda, North West Region, Republic of Cameroon
E-mail: balgazib@yahoo.com; Tel: (+237) 70 51 10 67; (+237) 91 47 42 31

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Many sociologists agree to the role of social mechanisms in rigorizing the identification, understanding and analysis of real world social phenomena. This framework has often been used in sociological literature to narrow the gap between pure descriptive and empirical discourse on the one hand and logical, abstract sociological modeling on the other, in modeling social phenomena. This article extends this conventional wisdom in the social science to the analysis of natural shocks, whose rapid upsurge has been observed in recent years. It is argued that an adequate theoretical and methodical approach to informal response mechanisms is prerequisite for understanding and explaining the black box often existing when such shocks occur in developing countries, where formal (state and market) mechanisms often fail or function only partially. Empirical examples are provided to strengthen the argument that understanding formal and informal response mechanisms using the social mechanisms framework can significantly improve analytical rigor, and illuminate any existing black boxes. Natural shocks are further presented as social phenomena that until very recently have not sufficiently attracted the attention of the social scientist.

Keywords: social mechanisms, informal responses, natural shocks, analytical rigor, black box

INTRODUCTION

Theorizing in the social sciences has generally been characterized by a dichotomy between the concrete and abstract. While concrete models attempt to explain social phenomena based on observable outcomes, abstract modeling has often departed from logical thinking, characterized by critical assumptions that culminate in logically attractive but often practically unrealistic models. This historically evolving separation of scientific knowledge generation into theoretical –based and more empirically focused approaches in the social sciences can be best described as unfortunate. In fact scientific discourse in the social and other sciences has been systematically approached from a supremely concrete or from an essentially abstract angle (Levi-strauss 1966). Insufficient efforts and interest has been demonstrated in the scientific community to converge these modeling approaches. The concept of social mechanisms – though only timidly – has been used in sociological literature as part of general attempts to consolidate an intermediary level in-between pure description, storytelling and empirical discourse on the one hand and logical, abstract sociological modeling on the other (Hedström and Swedberg 1996). The increasing complexity of social, ecological and natural systems and phenomena suggests that logical modeling must support the understanding, analysis and management of real world problems to be fully useful to the social scientist. The explanatory power of sociological models should increasingly be validated based on their relevance to explain complex real world situations, as well as their ability to adapt and remain useful under predictable and unpredictable conditions. The upsurge of natural disasters especially in the last three decades provides a body of extreme social phenomena on which relevant concepts and models can be tested for their validity, resilience and adjustability.

This article focuses on the concept of “social mechanisms”. It suggests that this concept in itself provides a middle ground theory that sufficiently combines abstract logic and empirical validity in understanding and explaining natural shocks. It is argued that adequate theoretical and methodical approaches focusing on informal response mechanisms are crucial for understanding and explaining the black box often existing when such shocks occur in developing countries, characterized by failing or partially functioning state and market mechanisms.

The article continues as follows. Section 2 briefly discusses and reviews the literature on social mechanisms, emphasizing its validity in explaining social phenomena. Section 3 propels natural shocks as social phenomena whose increasing occurrence (due to, but not limited to the effects of climate change) has accelerated interest from social scientists in recent years. The specific role of informal response mechanisms to shocks – as part of the social mechanism will be discussed in section 4. This discourse will be illustrated with empirical examples. Section 5 concludes.

Social mechanism: definitions and theoretical underpinnings for the analysis of social phenomena

Although the concept of social mechanisms has been used in the sociological literature for a long time now, it does not seem to have received sufficient systematic attention. Visible attempts have been made to vulgarize the importance of social mechanisms as an explanatory construct for the explanation of sociological phenomena. In fact social mechanisms have been hypothesized as a vital concept for explaining some of the black boxes abounding the social sciences, providing cause – effect linkages as a means to support sociological inquiry (Hedström and Swedberg 1996, Gross 2009). According to Hedström and Swedberg (1996), social mechanisms joined the classics in sociology only after the Second World War. Its grounding has been attributed to the work of Robert Merton (1968), who brought the idea of mechanisms in his search for middle-range theorizing, one that was to be located between social laws and description. The concept later grew in importance following the works of sociologists such Granovetter (1978) and Jon Elster (1989) just to name a few. Social mechanism as a concept was re-positioned in the sociological discourse in the later part of the 20th and early 21st Centuries by proponents such as Stinchcombe (1991), Berkes and colleagues (1995, 1998), Hedström and Swedberg 1996, Olsson et al (2003), Gunderson (2003) and Gross (2009).

The advancement on the concept of social mechanisms has been accompanied by efforts to provide suitable definitions. Merton (1968) defined social mechanisms as social processes having designated consequences for designated parts of a social structure. According to Merton, the essential task of sociology lies in identifying these mechanisms, establishing under what conditions they come into existence or not. Stinchcombe (1991:367) defined social mechanisms as ‘bits of theory about entities at a different level (e.g. individuals) than the main entities being theorized about (e.g. groups), serv[ing] to make higher level theory more supple, accurate and general”. While Elster (1989) does not provide a clear definition of social mechanisms, he suggests that the role of mechanisms is to provide explanations of finer grain to social phenomena as opposed to sociological laws of limited generality. Thus mechanisms can be understood as theoretical constructs that provide hypothetical links between observable links (Hedström and Swedberg 1996).

While a consensus might be agreed upon – that a general definition for social mechanisms has not been grounded, sociologists converge on the conviction that social mechanisms provide or encourage deeper, more direct and fine-grained explanations of sociological phenomena. Mechanisms help sociologists to distinguish between genuine causality and coincidence, providing better answers and a wider understanding of why what is observed is observed. Thus while statistical associations between sociological variables are indicative, social mechanisms specify the underlying explanatory mechanisms. As recalled by Hedström and Swedberg (1996), simply making *ad hoc* stories with regards to specific sociological phenomena does not constitute an acceptable sociological explanation. Social mechanisms therefore support the sociologists in their efforts to answer the ‘why’ questions abounding social events. Mechanisms can potentially expose the black boxes in sociological research (The black box phenomenon is often traced to the work of George Homans (1974). In a behaviorist tradition, the aims of his work was to arrive at general propositions based on a stimulus – response model without a critical examination of any generative mechanisms that might has influenced the stimulus to result in a particular response. This approach has been adopted for instance by rational choice theorists. However, understanding the black boxes (that is, examining the mechanisms behind these phenomena) can provide a deeper and more in-depth explanation of why such a relationship exists (Hedström and Swedberg 1996, Gross 2009)). Social mechanistic approaches can bring more realism for instance in the social interpretation of rational-choice model outputs. In a similar definition, Gross (2009: 364) views a social mechanism as "a more or less general sequence or set of social events or processes analyzed at a lower order of complexity or aggregation by which – in certain circumstances some cause *X* tends to bring about some effect *Y* in the realm of human social relations. This sequence or set may or may not be analytically reducible to the actions of individuals who enact it, may underwrite formal or substantive causal processes and may be observed, unobserved or in principle unobservable". The definition of Gross extends prior definitions by appending an observable possibility to social mechanisms. Nevertheless, most definitions point to the fact that paying attention to social mechanisms culminates in extended efforts to explain the 'unknown', that is, the reasons for why we observe what we observe.

Efforts to distinguish between black box phenomena and explanations relying on generative mechanisms have been made by some sociologists. Figure 1 below is drawn from the work of Hedström and Swedberg (1996) and Gross (2009). They assume an observable (non-random) relationship between two variables or events, **I** and **O**. The link between these two events can be expressed by the mechanism, **M**. According to these authors, what characterizes the black box is when the link between **I** and **O** is considered either to be void of structure or of no interest, probably because they cannot be observed. Thus a regression coefficient relating **I** to **O** is enough to describe the causal relationship between **I** and **O**. The black box becomes critical here, as the regression coefficient itself does not say much about the process through which this relationship was established. In fact the regression coefficient suggests the direction and strength of a relationship between **I** and **O**, but does nothing further than that.

In spite of its attractiveness, the concept of social mechanisms has been largely relegated to an insignificant position in the last few decades by a resurgence of general sociological theory on the one hand, and of a variable-centered approach of theorizing on the other (Hedström and Swedberg 1996). Nevertheless, advocates of social mechanisms have succeeded in completing a few attempts that can be found in the literature, to develop sociological explanatory constructs based on the notion of mechanisms. Outstanding in this development from a theoretical perspective include the works of Elster (1989), Stinchcombe (1991, 1993) as well as the classical scholarly work of Hedström and Swedberg (1996). Empirical advancements have been provided for instance by Berkes et al (1995, 1998, 2000), Schreider and Knerr (2000), Olsson et al (2003) and more recently Gross (2009).

Although in his book - Nuts and Bolt for the Social Sciences - Elster (1989) was unable to provide a convincing definition of social mechanisms, he however contributed to this development by suggesting that advancements in sociological theory should be contingent on efforts to increasingly apprehend knowledge of ever more social mechanisms rather than in ever-better theories. To illustrate his point Elster outlined a number of reflections around the concept of mechanisms namely (1) that causal explanations must be linked to causal mechanisms for completeness; and (2) that causal explanations must be distinguished from assertions about correlations and necessitations, story-telling and predictions. By implication, we would explain sometimes without being able to predict and vice versa, as long as efforts are not made to understand the underlying social mechanisms. Thus mechanisms provide "explanations of a finer grain" (Elster 1989:7), therefore giving more flesh and meaning to developing sociological theory.

Stinchcombe (1993) departs from the premise that what the social sciences lack is an armory of mechanisms for making social science theory. As such mechanisms are important for rendering lower, middle-range and higher level theorizing more supple, accurate and general. Thus while Stinchcombe's work deviates from that of Elster by making clear efforts to define what constitutes a purely sociological mechanism, both authors converge on the fact that social mechanisms are crucial for understanding and developing sociological theory, and explaining social phenomena.

Perhaps the most interesting contemporary effort on social mechanisms can be seen in the work of Hedström and Swedberg (1996). By focusing on the explanatory importance of social mechanisms, the central tenet of this work has been to illustrate that the identification and analysis of social mechanisms "is of great importance for the progress of the sociological enterprise" (ibid: 286). By recalling that statistical associations present 'black boxes' that suggest relationships between variables but do not provide any clue as to why this relationships might exist, the authors were able to advocate for more focus on generative mechanisms as a key approach towards providing or encouraging deeper, more direct, fine grained explanations of sociological phenomena in contemporary social science. Thus generative (social) mechanisms increase the understanding of why we observe what we observe. To further illustrate, these scholars explain the following, positioning mechanisms as theoretical constructs that provide hypothetical links between observable events:

"A statistical association between class and income tells us that individuals from a certain class have lower incomes, but it says nothing about why this is the case. To answer this question, it is necessary to introduce and explicate the generative mechanisms that might have produced the observed differences in average incomes

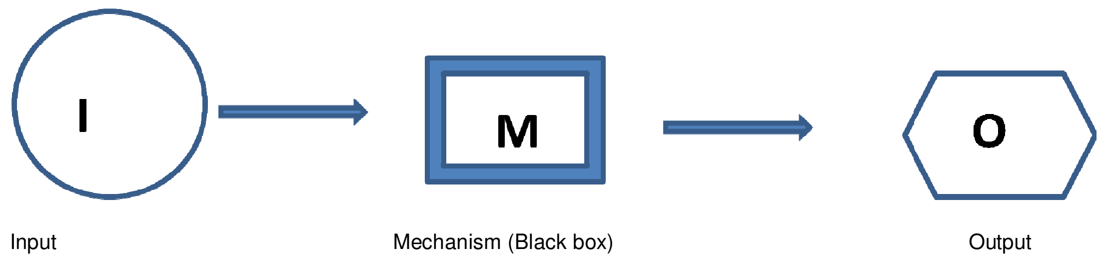

Figure 1. The black box phenomenon
Source: Adapted from Hedström and Swedberg (1996)

that the researchers have assigned to different classes. A statistical effect in a context like [this] is essentially an indicator of our inability to properly specify the underlying explanatory mechanisms" (Hedström and Swedberg 1996: 289).

To concretize the idea of social mechanisms on social processes and sociological theory, Hedström and Swedberg (1996) recall three well known theories in sociology namely the self fulfilling prophesy of Robert Merton, Granovetter's threshold-based behavior and Coleman's network diffusion theory. For this article, only the first two examples will be briefly re-visited as they very clearly support the argument undertaken in this paper in favor of the role of social mechanisms in explaining the unknown.

Robert Merton's (1968) self fulfilling prophesy rests on the basic idea that an initially false definition of a situation evokes behavior that eventually makes the false conception come true. Based on the example of a run on a bank Merton (1968) (cf Hedström and Swedberg 1996: 294) writes:

"If a rumor of insolvency somehow gets started, some depositors will withdraw their savings. Their withdrawal will strengthen the belief in the rumor, partly because the withdrawal may actually hurt the financial standing of the bank, but more importantly because the act of withdrawal itself signals to others that something indeed might be wrong with the bank. This produces even more withdrawals, which further reduces the trust in the bank, and so on. Because of the operation of this mechanism, even an initially sound bank may go bankrupt if enough depositors withdraw their money in the [initially] false belief that the bank is insolvent".

Thus while one would probably be able to establish a correlation between withdrawals and bankruptcy, the underlying mechanism itself remains a rumor. Only when the rumor can be re-dressed can such trends expressed in the self fulfilling prophesy be reversed.

In his threshold theory of collective action, Granovetter (1978) argued that an individual's decision whether to participate or not in collective action often depends in part on the decisions of others to participate or not. Thus actors differ in the minimum set of 'others' who must have decided to participate, for them to decide to do same. This is what he calls an actor's threshold, that is, the proportion of the group which must have joined before an actor is willing to do so. What is interesting from this collective action theory for the current discussion is that what we observe is for instance the participation or not by some, many or all individuals in some form of collective action. However the actual explanatory mechanisms of why we observe what observe (that is, the individual decision-making threshold mechanism) itself may not be observable. However, understanding these mechanisms is crucial for explaining for instance why some individuals readily participate in collective action while others do not.

The threshold theory of collective action has been theoretically and empirically examined to a large extent in the literature to explain sociological phenomena. Berkes et al (2000) for instance in a comprehensive literature review on the role of traditional adaptive knowledge on collaborative adaptive management suggest that social mechanisms form the fundament of traditional practices for ecological management such as multiple species management, landscape management and other traditional sources and approaches to responding and managing pulses of ecological surprises. Understanding these mechanisms can shed more light and analytical rigor to the social scientists, helping to explain why we observe what we observe, or why what obtains in one community does not in other communities. In a similar discussion, Gunderson (2003) holds that resilience – the maximum level of magnitude of disturbance that can be absorbed by a system – can be best assessed by combined understanding and analysis of the variables and mechanistic processes that define decision making and sometimes culminate in ecological surprises. Such a double pronged approach is essential for building long term capacities for resilience in sociological systems (Olsson et al 2003), and for bringing to light some of the black boxes prominent in grand sociological theorizing. In a more microeconomic analysis, Schreider and Knerr (2000) examined the role of labor migration as a social security mechanism for smallholder households in sub Saharan Africa. Based on their Cameroonian sample, they conclude that the relationship between livelihood diversification and poverty alleviation can be better understood if the mechanisms or driving forces underlying the decision to diversify (in this particular case – the decision to migrate) and to eventually contribute to poverty (through remittances) are analyzed. In their Cameroonian case study, they conclude that migration with remittances is most likely to fail to improve livelihoods "when the potential remitter does not expect any sizeable inheritance" (Schreider and Knerr 2000: 223). This conclusion has only been possible by the decision of the scholars to explore beyond the mere and well documented correlation between livelihood diversification and poverty reduction, to examine the underlying social mechanisms. This outcome supports the contention that a close look at social mechanisms improves additional analytical rigor with regards to existing correlations or observed relationships, by providing deeper, fine grained information on why such relationships exist in the first place.

In summary, it seems to have been established both theoretically and empirically that social mechanisms as a concept can be very useful in explaining sociological phenomena, improving on analytical rigor and giving more meaning to relationships established between variables, by suggesting the reasons why such relationships exist, are missing or change over time. One domain of sociology where very little effort has been made to extend this approach has been in the modeling of (natural) shocks. In the following section, we attempt this discussion. As will be observed, we do not only emphasize the inclusion and treatment of shocks as sociological phenomena that deserve the attention of sociological theorizing – similar to the work of Hedström and Swedberg (1996), but we also attempt to show how social mechanisms can be useful in illuminating the so many black boxes that are characteristic of sociological theorizing in the domain of natural and man-made shocks.

Natural shocks as social phenomena

This section is a devoted attempt to extend the concept of social mechanisms into the analysis of natural shocks. Natural shocks –sudden or slow developing responses from natural processes capable of causing welfare losses represent one of the branches of sociological research that still suffers from the black box phenomenon. Shocks can be generally conceptualized as inputs resulting in certain outputs, that is, their effects on individual and aggregated outcomes. That the type of shock – idiosyncratic or correlated – is largely responsible for different outcomes – such as poverty and vulnerability – is largely accepted in the topical literature. Correlated (or covariate) shocks are generally hypothesized to impact greater welfare effects than individual ones across a wide range of shocks of varied origins (Holzmann et al 2003, Günther and Harttgen 2009, Balgah and Buchenrieder 2011). Although one has to admit regrettably that natural shocks have not – until recently due to their increased frequency – attracted that attention and definition of the sociologist as a social phenomena, it remains doubtful whether sweeping conclusions on the relationship between shock type and subsequent outcomes lend themselves to sufficient sociological explanatory power. In fact such sociological allegations and theoretical relationships come under serious questioning in empirical case studies that often report contrary trends for instance as observed and reported by Günther and Harttgen (2009) in their empirical modeling of idiosyncratic and covariate shock impacts amongst households in Madagascar. A statistical correlation between covariate shocks and the poverty status of victims for instance does not say much about why such a relationship exists. An understanding of the generative mechanisms – the outcomes of which are the observed relationships – or whose changes can lead to other outcomes under different conditions, is crucial for the advancement, understanding and validation of sociological theory. The hypothetical example of the application of a mechanistic approach to analyzing shocks (Shocks as used in the disaster management literature refer to sudden or slow developing events with welfare depriving capabilities. These shocks can be natural- originating from natural processes such as droughts, floods and earthquakes, or could be man-made, resulting from the breakdown of regular endogenously embedded structures within a social system. Examples of the latter include riots, ethnic conflicts and outright war. These shocks can be idiosyncratic – affecting only a few such as death of one household member, or could be correlated amongst many households for instance as in the case of the famine in the horn of Africa that affected over 10 million people (Albala-Betrand 1993, Holzmann et al 2003, Balgah 2011). Correlated shocks are generally accepted to cause more welfare losses on victims – and therefore correlated with poverty outcomes. However the fundamental mechanisms have not received enough attention, especially those (informal) mechanisms that lie outside states and markets) is illustrated in figure 2 below. A shock itself is understood as an 'input' into a static or dynamic social system. By definition, this shock input can be idiosyncratic or covariate. Irrespective of the actual nature of the shock, it is hypothesized in this framework that it is the type and forms of mechanisms constituting the black box (formal, informal or both) that determine the actual shock outcomes such as poverty, vulnerability, resilience or adaptation. When formal (state and market) mechanisms are dysfunctional or function only partially for instance, informal mechanisms may play a dominating role in determining shock outcomes and vice versa (Balgah 2011). It seems logical to assume here that the mechanisms at work significantly account for the differences in outcomes and their analysis should increase the explanatory power of statistically observable

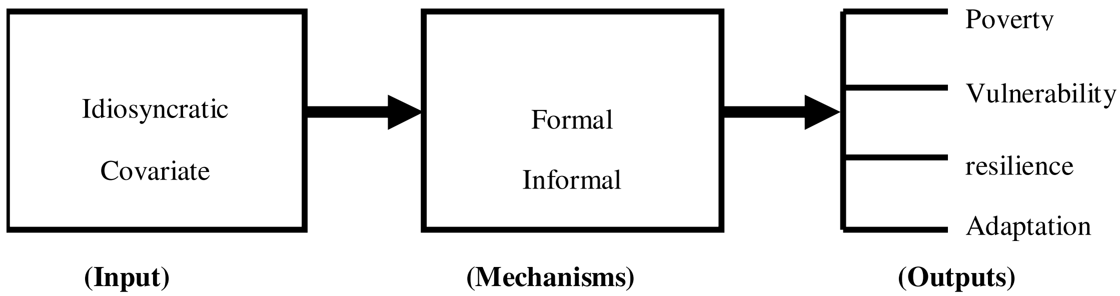

Figure 2. Schematic presentation of shocks as social phenomena
Source: Author's illustration

relationships. Understanding these mechanisms can therefore be crucial in explaining observations and improving on the analytical rigor. Thus we share the conjecture of Hedström and Swedberg (1996) that it is by referring to the underlying mechanisms that observed relationships are rendered intelligible. This theoretical position seems vital in understanding and explaining the ensemble of shocks and their different outputs, upholding the contention that shocks, irrespective of origin and magnitude, must be considered as social phenomena.

This section of the article has departed from the premise that understanding and applying the concept of social mechanism can be vital in providing insights, improving explanations and increasing analytical rigor in capturing, managing natural shocks as social phenomena, irrespective of their origin. The following section suggests some empirical evidence to support this contention. Efforts to illustrate the need for a deeper understanding of the generative mechanisms that underlie the empirical examples as prerequisite for sounder analysis of such phenomena are discussed.

The role of social mechanisms in analyzing shocks: Empirical evidence

This section provides empirical evidence that suggests the validity of social mechanisms in explaining natural shocks. Selected examples from Cameroon (in Africa), Thailand (in Asia) and New Orleans (in the United States of America) will be discussed in this order.

1. Victim behavior after the 1986 Lake Nyos disaster: what can mechanisms explain?

On August 21st 1986, a natural gas explosion from Lake Nyos in North West Region of Cameroon emitted Carbon dioxide and minimal amounts of Hydrogen sulphide asphyxiating over 1,700 inhabitants and almost all livestock in three villages (Nyos, Cha, Subum) located within a diameter of over 25 kilometers around the Lake. Later scientific investigations revealed that Lake Nyos contains a huge amount of Carbon dioxide (300 million cubic meters) in the deeper layers, with threats of further release in the future. While the scientific community was busy analyzing the cause of this natural shock, a high level conference on the Lake Nyos disaster held in Yaoundé, Cameroon in March 1987 proposed that surviving victims should be resettled immediately (Sigvaldson 1989). By the end of 1987, the first government-led resettlement had been effected in neighboring, unaffected Buabua and Kimbi villages. Most households moved in the same year. The rest followed in 1988 (Balgah and Buchenrieder 2011).

The shock-affected villages were declared disaster areas by the government and moving back was legally prohibited. With the objective to reduce risks and enhance safer rehabilitation, the Government and foreign partners embarked on a degassing project in 1995. One full-fledged degassing column was installed and primed at Nyos in 2001, although five columns are needed to completely rule out the possibility of another lemnitic eruption (Halbwachs et al. 2004).

In a socioeconomic survey of surviving households of the disaster carried out in 2009/10, it was observed that many surviving households had self-relocated back into the disaster zone in the last decade in spite of government restriction. Bang (2008) suggests that a major motive for self-relocation is the deficiency of official post-shock management to jointly address physical, structural and social risk mitigation. This conjecture is difficult to confirm, considering that government efforts towards disaster risk reduction was visible during the field work. To answer the question why some households and not all had illegally returned to the disaster zone, Balgah and Buchenrieder (2011) used experimental econometric approaches, combined with hypothetical questions in the administered questionnaire to illicit differentiated risk behavior between those who have returned and those who have not. As illustrated in table 1 below, one of the key underlying factors that explain the differentiated behavior is the degree of risk aversion which is lower in relocating households (indicated by their willingness to participate by making any payments in lottery games) compared to those who are stationary. This trend was

Table 1. Hypothetical willingness to pay for lottery tickets by household type

Possible win	Payment categories	Resettled (%)	Relocated	P	Likelihood ratio
Up to 100 USD	0 FCFA	83.8	41.7	.002	.001
(50,000 FCFA)	> 0 FCFA	16.2	58.3		
Up to 2000 USD	0 FCFA	83.8	41.7	.001	.000
(1,000,000 FCFA)	> 0 FCFA	16.2	58.3		
Up to 4,000 USD	0 FCFA	83.8	41.7	.003	.002
(2,000,000 FCFA)	> 0 FCFA	16.2	58.3		

Note: 1 USD is exchanged for approximately 500 FCFA
Source: Balgah and Buchenrieder (2011)

maintained in the experimental games, giving the authors reason to argue that the decision to self-relocate or not is fundamentally explained by unobservable endogenously embedded risk taking abilities, the observable component of which is manifested in the action of relocating or not. Interestingly, the household size of non-mobile households (mean=9) was significantly higher than for self-relocating households (mean=5). This seems logical as self relocation decisions are technically more difficult to arrive at in larger than smaller households. As suggested by Hedström and Swedberg (1996), a closer look at these underlying mechanisms provided deeper, fine grained explanations for the observed phenomenon of self relocation. Thus the concept of social mechanisms can – at least as a conclusion from this empirical example – potentially improve on the analytical rigor of observed social phenomena in particular and the development of sociological theory in general.

2. Social mechanisms and reconstruction after the 2004 Tsunamis in North Thailand

The Tsunamis of December 2004 impacted devastating effects on many Asian countries. In northern Thailand for example, it rendered most inhabitants poor, creating losses that affected the whole Thai economy. Six provinces along the Andaman Coast were heavily destroyed, leaving 8,000 people dead. Coral reefs and coastal habitats were interfered with and the intrusion of sea water affected agricultural productivity. The estimated financial loss was US$ 2 billion, and the overall GDP growth of Thailand reduced by 0.4% (Segschneider and Worakul 2007).

The Lampoon community in Takua Pa District was seriously affected by the Tsunami. Only 30 of 52 original families could be identified in the community after the disaster. Although a huge wave of aid swept into the affected communities after the retreat of the Tsunami, “many people in Lampoon had little opportunity to obtain any of this aid. The land [had been] cordoned off and many people were unable to enter and find the remains of their dead ones” (Santhaboa 2008: 9). The Lampoon community is not a fishing community, although it is located along the Andaman Coast. Its inhabitants are primarily former mining workers who migrated into the region in the 1970s but remained after the mining concessions had expired. In spite of land reforms in Thailand in the later part of the twentieth century, these villagers could not acquire land titles because the major mining companies rebuked such attempts claiming ownership over the land. In addition, land title issuing officers required bribes which community members were too poor to afford. Thus surviving households in Lampoon community were not only faced with the difficulty to access relief aid and identify their plots, but also with the problem of returning to this property after the disaster even if individual parcels could be identified. They were constantly threatened and prohibited by the mining companies from rebuilding their houses. Only community mobilization and collective action brought progress.

After a series of community meetings, four regional slum networks were formed. Villagers returned to the area on 4 February 2005 with the intention of reconstructing their houses. Fast, quality and cooperative work was needed, in addition to funding. Through community dialogue, each household agreed and contributed a lump sum of 1,000 Baht for daily expenditures and a collective loan of 500,000 Baht for high cost activities and management (Santhanboa 2008). 1 US Dollar at the time was equivalent to 34.1 Thailand Baht (THB). The community decided on the construction of 30 houses (i.e. one house per surviving family). Some additional financial resources were obtained from non-governmental organizations such as The Thai Red Cross Society, Oxfam, World Vision and Plan International. Based on a budget drawn up and transparently managed by the stakeholders themselves, and with the employment of community labor, 30 houses were constructed in six months. A close examination of this case study by Santhanboa (2008) and Balgah and Buchenrieder (2010) suggests that socially embedded mechanisms such as the ability to organize and act collectively as well as endogenous cognitive social capital (such as solidarity and reciprocity) can help explain why these victimized households were able to return to their former land and completely construct houses, in spite of evident resistance from the mining companies claiming ownership of the land. This conjecture is supported by a statement of one of the victims:

"During those days, none of us had a good night's sleep. After we started, more and more people began to join in. The rebuilding of houses was intended to become a community activity in order to strengthen the process [of reconstruction]" (Pi Yupin as quoted by Santhanboa 2008: 13).

In our opinion, this example mirrors the Granovettian (1978) threshold theory of collective action, further developed for instance by the same author (Granovetter (1983, 2005)) in his discourse on network theory and the role of socially embedded mechanisms on economic outcomes respectively.

3. Explaining resilience to hurricane Katrina on the basis of endogenous mechanisms

Hurricane Katrina of August 2005 killed over 1,000 persons and flooded approximately 80% of the city of New Orleans within 18 hours (US White House 2006). The following communities were highly affected: African-American families (living close to the poverty line), undocumented Latino laborers, and a Vietnamese community. The Federal Emergency Management Agency (FEMA) did not execute its task with diligence and there was severe lack of trust among residents towards government officials and formal disaster recovery and emergency agencies (Mitchell et al. 2008). The Vietnamese community was observed to exhibit exceptional resilience and the youth and children demonstrated stronger agency. This resilience has been attributed to their "unique history that stems from the Vietnam War" (Mitchell et al. 2008: 267). As Mitchell et al. (2008: 267) explain further:

"During the hurricane, many adolescent and children assisted in evacuation, relief and recovery. In the recovery period they have been instrumental in boosting [community] morale and bringing to attention other risk issues affecting their community. For example youth members have been participating in the political arena to ensure the community is aware and involved in formal recovery mechanisms".

The recovery process after the shock from hurricane Katrina in New Orleans, especially in the Vietnamese community, has been enhanced by informal mechanisms, particularly youth groups and community members. This case study re-emphasizes the resilience and dynamism of informal risk management instruments can be given additional explanatory rigor by paying attention to both visible and invisible mechanisms. The issue of invisibility of social mechanisms has been recalled recently by the definition proposed by Gross (2009). Consolidation of local spaces and expansion of spaces of engagement was achieved through a solidification and appropriation of past experiences (Balgah and Buchenrieder 2010), which is an integral part of the social mechanistic process.

CONCLUSIONS

Dichotomy between reality and abstract modeling in social theorizing is not new and has constituted a major setback to advancements in the discipline. While this divergence that has culminated in distinct empirical and theoretical approaches in the social sciences can be best described as unfortunate, efforts are needed and have been made over the years to unite both approaches. The concept of social mechanisms for instance has been suggested and discussed in the literature as a possible approach to foster theoretical unification. Proponents demonstrate that understanding underlying mechanisms illuminate the 'black boxes' abounding statistical relationships between variables that in themselves do not provide any clue as to why such relationships might exist. This approach lends itself to some well known sociological theories such as Merton's (1986) self-fulfilling prophesy and Granovetter's (1978) threshold theory of collective action.

This paper has attempted to support the line of theory that propels the fundamental role of social mechanisms in enhancing analytical rigor explaining social phenomena. Using (natural) shocks as social phenomena, social mechanisms have been positioned both from theoretical and empirical perspectives as fundamentally useful in giving meaning to social reality and supporting the social scientist in trying to explain why we observe what we observe, with specific reference to natural shocks. The concept of social mechanisms should therefore provide at least partial answers for instance as why natural shocks affect people differently, why some victims and shock-exposed communities adapt or are resilient to such shocks and others are not, why shocks are virulent under certain conditions and not always, etc. The discussion developed in this paper leads to a number of conclusions.

First, natural shocks and their accompanying processes must be seen as social phenomena. This conclusion stems from the fact that the occurrence of a natural shock accounts for an input (I) which is linked to different outputs (O) such as vulnerability and adaptation as presented in figure 2 above. This link is better understood by an analysis of the (formal and informal) mechanisms and the extent of their differentiated influences in promoting or preventing certain outcomes.

Secondly, the concept of social mechanisms seems quite applicable and appropriate in understanding, analyzing and interpreting extreme events. Evidence for this conclusion has emanated for instance from the case of differentiated social behavior of victims and non-victims of the 1986 Lake Nyos disaster in Cameroon, victims of the 2004 Tsunamis in Vietnam and those of hurricane Katrina in New Orleans. However, because these are just few case studies, further application of this concept would be necessary for additional validation of its wider relevance in explaining natural shocks.

Thirdly social mechanisms seem useful in explaining from a general perspective existing black boxes in social theorizing. Not only does it present a partial solution to improving on analytical rigor in the social sciences, but it also contributes to narrowing the gap between abstract and reality. This approach could be useful for analyzing different sociological phenomena in general and extreme natural shocks in particular. For social mechanisms concept to assume its rightful place in the social sciences, much more focused work and further validation will be necessary.

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