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Surviving the Storm: Behavioural Economics in the Conflict Environment

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Abstract: While behavioural economics has become part of mainstream economic theory, showing systematic deviations from the standard homo economicius in normal environments, there has been little exploration of behaviour in the extreme – such as conflict, disasters or war zones. This has led to the underdevelopment of behavioural theory examining the choices or motivations of individuals within these environments, resulting in sub-optimal models and policy. This work provides an entry point for the application of behavioural economics within conflict zones, specifically the examination of decision-making of non-combatant individuals. Additionally, it provides insight into the related disaster research field, detailing current studies, overview methodological approaches, approaches and limitations. Concluding with a general discussion and potential implications for policy.

Keywords: behavioural economics, conflict, experiments, analytic narratives

JEL Classifications: C90, C93, D03, D74, D81, H84

> *The most shocking fact about war is that its victims and its instruments are individual human beings.*
>
> Huxley (1937)

> *The reality of our era […] is that torture is rampant, murdering civilians commonplace, and driving the survivors from their homes often the main goal of a particular military offensive.*
>
> Gutman, Rieff, and Dworkin (2007)

1 Introduction

Conflict and war are a disaster enacted by man and have been a constant throughout human history, but unlike the natural disaster its victims may not be random. War has been the instrument of kings and warlords, its study was

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limited to tactics and costs with little thought spared to the flotsam[1] and jetsam[2] it created. Individuals caught in the storm are often set adrift as a consequence of conflict, but until recently have not been included into the cost estimates of war. These calculation are greater than the military expenditure or infrastructure damage, as they now include the loss of lives, human and social capital. We have identified that non-combatants are placed in grave danger and in desperate need of assistance, the most vulnerable being the weak, the elderly and those too young to flee or defend themselves.[3] However, there has been little analysis on the decision-making of individuals within these zones, resulting in an inferior understanding of the choices, motivation and options available to or made by individuals. Recent research has demonstrated that conflict and war zones (like disasters) can be examined through the lens of a naturally occurring field experiment. Such that we can examine behaviour and choices in an environment that is otherwise exceedingly difficult. Disasters, whether man-made or natural, represent a danger to life, the destruction of property and a threat to a culture or society.[4]

A fundamental reason to apply behavioural economics to conflict zones is that decisions made in this extreme environment can significantly affect the probability of survivability, not only for an individual but also for family, friends or even other members of that society. In conflict zones around the world we observe tragedies being paid for in human lives, the destruction social structures and the eradication of entire cultures. Scarcity, it is the nature of economics and the world that we have a resource allocation problem, for which the allocation of humanitarian aid and support is no different as there are too many in need with too few resources to go around. Ironically it is often the shortage of resources that is the root cause of many conflicts. For the maximisation of our limited resources, we require a better understanding of behaviour and extreme environments, to enable the prediction of resource needs and better facilitate deployment strategies. While the advancement of knowledge and understanding is a worthy goal in and of itself, such insight will enable us to anticipate humanitarian crises and as well as better predict the needs of refugees.

The seminal work of Jack Hirshleifer examined many forms of conflict, focusing on its mechanisms and causes rather than the behavioural or decision-making

1 *Flotsam* is debris unintentionally lost overboard, the result of an accident or shipwreck.

2 *Jetsam* is debris intentionally jettisoned by a ship, often to lighten a ship taking on water.

3 The results of which saw the creation of agencies such as Amnesty International and the Geneva Convention to promote human rights and the enforcement of the rules of war.

4 For an example using floods Page, Savage, and Torgler (2014) or maritime disasters Frey, Savage, and Torgler (2010b).

aspects,[5] with particular attention paid to insurance (see e.g. Kunreuther 1996; Kunreuther and Roth 1998). Economists mostly restricted their estimations to economic losses, such as buildings, infrastructure and productivity, rather than on human life, social capital or social structure. This is not unsurprising given the difficulties of estimating the value of a human life and direct valuations have been avoided, resulting in abstracted estimations like the Value of Simulated Life (VSL), remaining lifetime productivity or an estimation of insurance value.[6]

The remainder of this paper is laid out as following: The next sections discuss how behavioural economics may facilitate research of the conflict environment with a broad discussion of behavioural economics and an overview of applicable research; This is followed by a discussion of the potential impact of moral and social norms, identity, the panic myth and the fight, flight or affiliate model of behaviour; A methodological section outlines the potential for conducting experimental and narrative research within conflict zones with approaches and limitations; concluding with a discussion on ethics, morality and policy.

2 A behavioural perspective

From the outside it is often difficult to comprehend extreme environments or the actions and behaviour of individuals within them. Decisions made in conflict zones are neither minor or simple and are likely to be some of the most difficult, costly choices an individual could be forced to make in their lifetime. This decision uproots family, from all that is familiar and forces them to travel into the unknown, full of uncertainty and trepidation. It is little wonder that from the outside it is difficult to understand the gravity of these decisions, but this is precisely what we must attempt to do if we are to have any chance of gaining insight into such an extreme decision process. Regardless of the extreme environment type (conflict, disaster or terrorism) many of the same questions are raised about the actions, behaviour and decision-making of individuals.

The most fundamental questions we seek answers to are likely to be some of the hardest to obtain, as they will require innovative analysis and have potential risk to the researcher. Simon (1987) described behavioural economics as an

5 This is not dissimilar to the economic analysis of disasters, where the attention was focused on the short and long run cost of disasters Hirshleifer (1963); Dacy and Kunreuther (1969). For additional contributions see e.g. De Alessi (1975), Sorkin (1982), Albala-Bertrand (1993), Grossi and Kureuther (2005), Kunreuther and Pauly (2005).

6 This estimate process is flawed, the examine the willingness of individuals to insure against the possibility of some future problem but are heavily subject to budget constraint.

empirical test for the validity of neoclassical behavioural assumptions and when found lacking, to provide new empirical evidence to guide policy. There are problems when it comes to identifying deviations from the assumptions: Firstly, the difficulty in obtaining empirical data with which to test. This will require some innovation in the methodological as individual level data from these zones is not common. Secondly, we need to identify the right questions to ask. We need an understanding of why people choose to stay or leave and what factors influence this decision process? If or when do individuals choose to flee a conflict zone, do they have an specific demographic identity and are they somehow different from those who chose to stay? Where do these individuals go, who do they take or leave behind, in what direction do they flee and when they do so in what manner to they behave do they panic or is their behaviour rational/predictable? Finally, once we have access to empirical data and have set upon a question, we need an understanding of behaviour to apply as an analytical framework. This may require us to cast our net outside the mainstream of economic theory, challenge assumptions and include concepts from the broader social and behavioural sciences.

In its most abstract form, the decision to stay or leave a conflict zone is a rational choice problem (Becker 1976), between two current value estimations of future utility – one to stay the other to go. The complexity comes not from the final decision, but from the how that valuation is reached or estimated, the assumption that individuals are self-interested utility maximisers with stable preferences and are not influenced by external factors. Behavioural economics (BE) exists because research has demonstrated that in many situations individuals deviate from the predictions of the model breaking the assumption of rationality. For example, under duress or in high stress circumstances individuals find it difficult to judge between closely weighted options and are prone to errors in weighting options (Johnston, Poirer, and Smith-Jentsch 1998). Furthermore, individuals cannot know all possible options and therefore use a limited or bounded set to make decisions, some options may be intentionally discarded as being too unlikely and other are not included either through ignorance or unawareness (Elster 1985; Kahneman 2003; Rubinstein 1998; Simon 1957, 1991) Another limitation is our use of heuristics to make "quick and dirty decisions" that we base on previous similar situations or examples, which can be wrong for a different context. Humans are inconsistent when evaluating future values (time preferences), such that the further away an event is in time the greater we discount its utility in an estimate of its value today (Beraldo, Caruso, and Turati 2013; Frederick, Loewenstein, and O'Donoghue 2002; Laibson 1997). Kahneman (2011) proposed that we have dual processing system (fast and slow thinking), a quick intuitive vs. a slow conscious thought process that can lead to very different outcomes. Additionally, humans suffer from a status quo bias, such that we are

often more comfortable to leave things as they currently are even if it is not the best choice (Thaler and Sunstein 2008).

An important factor influencing the decision making process are risk preferences, i.e. risk aversion can result in the over weighting of risk factors and risk seeking can result in the under weighting of risk. In line with this is prospect theory, Kahneman and Tversky (1979) posited that the way in which choices are framed affect the willingness to take or avoid risk, specifically in the direction of losses. Lerner and Keltner (2000) and Shahrabani et al. (2012) showed through the analysis of soldiers and students in Israel (Gaza), that not only does emotion (fear) effects the perceived risk, but that it may also impact on the decision to remain in a conflict zone. They conclude that geographical distance from a war zone does not always affect negative emotions and that there is a positive correlation between perception risk and self-risk (Rosenboim et al. 2012). It may be of interest to analyse the relationship between risk preferences and perceptions and behaviour, as differences will create temporal variations in the decision to flee a conflict zone. This understanding would assist in the prediction of movements of refugees fleeing conflict zones and for modelling the timing of movements. One of the assumptions we make when individuals choose to stay in a risky environment is that the disutility of fleeing is less than the risk corrected utility of staying. It is likely to be difficult to estimate the spatial utility cost of conflict, for not only must the individuals risk type (preference) be taken into account, but also the individual's perception of risk and the nature of the conflict itself (Charness, Gneezy, and Imas 2013; Kahneman and Tversky 1992; Pratt 1964; Rabin 2000; Wakker 2010).

In this regard, not all disasters are the same even within a singular disaster type where the size, scope and nature of the event can vary greatly. This is also true for conflict and the relationship that an individual has with it can differ. It would be important to be able to identify and understand the environmental factors (Simon 1956) associated with the different operational conflict types and their philosophical nature. There are fundamental differences in the way that conflicts can be conducted, e.g. "conventional warfare entails face-to-face confrontations between regular armies across clear front lines" (Kalyvas 2005, 90) with relatively stable or slow moving fronts. During this type of conflict citizens and non-combatants who are remain at some distance from the "front line" could consider themselves relatively safe (see e.g. Balcells 2010, 2011). However, if we look at the way in which guerrilla conflicts are conducted they are a "dispersal of one's forces, hit-and-run military actions, the prevention of enemy concentration, and the avoidance of open battle or large confrontations" (Smith and Keeney 2005, 51). This results in regions of more or less conflict but no clear safe areas behind the lines. This was evident during the Vietnam War the Vietcong

hid underground and moved with relative ease through villages and terrain to be able to engage in conflict across a broad regions and areas. This tactics was also present in the recent conflicts in Afghanistan, for while the Taliban have strongholds and loose regional control, it is difficult to pinpoint a clear line of conflict (Larsdotter 2005). In addition to how conflict unfolds, the underlying reason for the conflict can vary widely which can include ethnic, religious or economic. The expansion of the Caliphate into Europe in the 7th and 8th centuries and the Christian crusades from the 11th to 13th centuries are historical examples of religious conflicts. The Holocaust can be viewed as either an ethnic and economic conflict (or both), such that the Jews were identified as being responsible for the woes of the german people at that time, but while ethnic justification was espoused it was also for clear economic benefit (Caruso 2016, forthcoming). It is difficult to seperate ethnic an religious conflict as they are often both present in the differences between groups. The differences of risk between conflict types will have direct ramifications on uncertainty; clearly defined conflict zones are more predictable with relatively consistent levels of risk. However, guerrilla conflicts are more random in nature and are likely to generate greater levels of uncertainty, both of which are likely to have a significant impact on utility estimations, as will demographic identity[7] distance from the conflict. In all conflict types there will be some underlying relationship with individuals, that will make them either more or less likely to be targeted or caught within the conflict.

3 Identity and cognitive dissonance

Economists were aware that individuals were not all the same for quite some time, as it required simple abstract modelling to have assumptions of homogeneity to be tractable. This created some very detailed econometric solutions for the heterogeneity or omitted variable bias problem. The advent of behavioural economics meant we have pursued individual differences, attempting to model how variations impact the decision process. We recognise that individuals belong to and identify with being part of specific groups, which often have clearly defined and identifiable sets of behaviours, customs and ideals. This identity has a significant impact not only on the decision making process, but also on the manner in which individuals estimate the utility payoffs values. Identity can increase or decrease an individuals payoff depending on how well they identify with the ideal member of their own group (Akerlof and Kranton 2000). This indicates that

7 In many conflicts there is a specific targeted type, albeit of race, ethnicity or status.

individuals, who do not conform to the ideal expectations, either through low effort or through non-compliance of social normative behaviours, would suffer from a decrease in utility.[8]

In collectivist societies members gain additional utility from pro-social behaviour such as altruism and helping-behaviour. Alternatively, individualistic type groups or societies have norms where individual achievement or task is of greater importance than following the social norms. This demonstrates that actions can be dependent on the structure of that society. However, in pluralistic societies we observe a vast range of groups and identities, often individuals can identify to many groups at the same time.[9] This creates a complex relational position for individuals who have competing identities, such that deviating from one creates disutility while moving closer to the other may generate additional utility. This may generate cognitive dissonance (Festinger 1962a,b) where the choices could be inconsistent with their underlying beliefs of the other identity, both of which could be vital but require different actions.

For example, as the environment becomes more dangerous from rising levels of conflict, individuals with family are faced with a choice between staying and leaving. Males are often in the roles of the *provider* or *protector* of the family unit, which are can be closely aligned goals and create no tension. As the *protector* they have the desire to keep the family away from danger and the *provider* also keeps them from harm but using shelter and food. When conflict closes in the two roles begin to have different agendas, the *protector* want to take the family out of harms way, leaving the conflict zone. However, the *provider* will not be able to do so if they move, shelter, sustenance and support are all rooted to the locality and the individual does not know if they will be able to perform this function if they move. They know they should move, but do not want to leave the security of the home environment, the uncertainty of the conflict and the uncertainty of leaving are causing the cognitive dissonance. This dissonance could also be seen in the desire to remain with ones people, to help them to fight as a group for survival and the desire to flee, to take your direct family (kin) and get to a place of safety. If the payoff of the group survival outweighs that of the smaller family unit, it may account for reasons why individuals do not flee.

One of the problems with identity is that it exists in a symbiotic feedback loop with both social and moral norms, both of which directly and indirectly affect the decision-making. Social norms direct both individual and group behaviours and

8 See the appendix for a more formalised discussion of the utility/identity models, also see (Akerlof and Kranton 2002, 2005) for an extended discussion.

9 For example: an individual can simultaneously identify with nationality, gender, career, social group and sporting club.

are the conditions under which a society operates, as members are observed conforming to a social norm others follow (Banerjee 1992). Alternatively, moral norms are guided by internal belief systems and do not require exogenous stimuli, they are unconditional and not affected by the presence or behaviour of others (Elster 2007, 104). When social norms are internalised they become an integral part of an individual's identity and are used as a reference in the interactions between individuals within that society (Parsons 1964). Social norms also set the perceptions of altruism, fairness and reciprocity, which also impact the decision process (Falk, Fehr, and Fischbacher 2008; Fehr and Gächter 2000; Fehr and Schmidt 1999). We must also be aware that social norms erode if there is no stabilising presence such as social sanctions or retaliation (Heckathorn 1989). It may be possible to break socially acceptable behaviour under some circumstances, e.g. if the individual believes they will not get caught having done so. In this case it could result in antisocial or criminal behaviour if survival is at stake. Norms are not just the cultural identity of an individual, but also includes their beliefs about equity, fairness and justice (Frey, Savage, and Torgler 2011; Savage and Torgler 2010). As such it may also be interesting to investigate additional aspects of norms such as internalisation, moral norms and observation.

4 Panic or fight, flight and affiliate

One of the enduring myths that plague disaster research and policy is that of panic, specifically mass panic. For example, in an article called "The Human Being in Disasters: A Research Perspective" Fritz and Williams (1957, 42) claim:

> *"(Human beings) … panic, trampling each other and losing all concern for their fellow human beings. After panic has subsided, so the common perception would indicate, all individuals turn to looting and exploitation, while the community is rent with conflict…."*

Quarantelli (2001) clearly refutes this point that despite major evidence to the contrary, panic remains part of the popular imagination and continues to be evoked as part of disaster management plans worldwide. Indeed a large volume of the literature rejects these assumptions, demonstrating the lack of such behaviour which has included: the inability to act rationally with chaos, social breakdown and antisocial behaviour – crime, looting, or exploitation (Brown 1954; Drabek 1986; Goldthorpe 1998; Gwynne, Galea, and Lawrence 2006; Heide 2004; Howard 1966; Johnson 1988; Mawson 1978; Mintz 1951; Quarantelli 1972, 2001). A breadth of empirical work has also demonstrated that tenets of acceptable behaviour and respect for law do not break down (Aguirre, Wenger, and Vigo 1998; Drabek 1986;

Hancock and Szalma 2008; Johnson, Feinberg, and Johnston 1994; Quarantelli 1960; Tierney, Lindell, and Perry 2001). Van der Heide (2004) concludes that four conditions that need to be present for individual panic to occur: Victims perceive an immediate threat of entrapment; Escape routes appear to be rapidly closing; Flight seems the only way to survive; and No one is available to help. To have all four of these conditions present in a single situation would be highly uncommon, thus making panic also rare. Mawson (2005) also believed that the conditions for mass panic to occur were that people believed that major physical danger is present or imminent and that escape routes are either limited or rapidly closing. The root of the word panic[10] gives insight into the expected behaviour, "irrational or random behaviour," the existence of panic behaviour can be quickly refuted by simple empirical analysis. If is evidence of patterned behaviour or some demographic determinant of survival, this would indicate that (however, unusual it may seem from the outside) individuals have acted in some systematic or predictable fashion. Ergo, no panic! If individuals are not panicking, then how are they behaving?

The movement of individuals within these zones is complex and the only way to disentangle it is to understand the motivation for the movement. While it may seem that some individuals flee while others remain where they are, we need to question the why. Are these moving running to or from something and those that are currently stationary have they already arrived or not yet left? Human physiology can provide insight into some movement, specifically the immediate response to danger – the fight or flight reflex. However, this is a short run adrenaline burst designed to either fight off an attacker or run from them but does not persist over the longer term. This effect can be observed in the survival differences in a comparison of the Titanic and Lusitania disasters (Frey, Savage, and Torgler 2010a). Once individuals have cleared this stage they seek the familiar, the support of family and loved ones even if that means moving towards the perceived danger, this is the social attachment model of human behaviour.[11] Mawson (2005) believed that, "organised and altruistic behaviour is the rule" and that "the most extreme stresses, including drowning at sea, can be calmly faced if the individual is not separated from his fellows … conversely being alone in an unfamiliar environment or with strangers heightens the response to stress

10 It was believed that the angry shouts caused by waking the Greek god Pan was said to inspire panic (panikon deima) or sudden fear. This is the root of the English term, defined as: "a sudden overwhelming fear, with or without cause, that produces hysterical or irrational behaviour, and that often spreads quickly through a group of persons or animals." Sourced from the online dictionary at http://dictionary.reference.com/browse/panic.

11 For an extended discussion see Mawson (1978, 1980, 2007).

and increase the probability of flight" (Mawson 2005, 97 & 100). Contrary to the expected model of behaviour, this may not be social breakdown or irrational behaviour but an observation of collective behaviour and an affiliative response to danger.

Affiliative behaviour was clearly observable during the 1993 World Trade Centre (WTC) bombings[12] (Aguirre, Wenger, and Vigo 1998) and the evacuation of New Orleans prior to Hurricane Katrina (Rosenkoetter et al. 2007). During the 1993 bombings over 75% of those surveyed indicated that they knew something serious had occurred but only 8.7% of the groups surveyed chose to act and evacuate. All the remaining individuals delayed evacuation and clustered into groups of people they knew, 63% sought additional information before committing to a course of action. The larger groups took longer to begin taking any action, over 6.7 min longer on average than the smaller groups or singles. This affiliation response was again observed for evacuations prior to hurricane Katrina, individuals living alone and females were the best predictors for evacuation. This holds with the concept that individuals are more prone to flight if they are not part of a social group and are more willing to do so if they fear for their own safety. This behaviour is socially normative, where individuals run to those with whom they have the strongest social bond (family, friends, etc.). If this behaviour were to be followed we would expect to observe strong correlations within social connectedness, both for the positive and negative findings. Families and those with strong social bonds would be likely to survive or die together. Panic or flight behaviours are representative of self-interest or survival behaviour, where the individuals flee to preserve their own life, possibly even at the expense of others.

It is clear that a large number of complex interactions occur when individuals need to make decisions in extreme, life-and-death environments, but this complexity should not be a limiting factor. It may require researchers to be open to new methodology and able to integrate concepts and ideology from outside economics.

5 Methodology

To move forward we need to adopt the wisdom of Prince (1920), who advised that "… knowledge will grow scientific only after the most faithful examination of

12 For an extended discussion on the costs of the 9/11 attacks on the WTC please see Peace Economics, Peace Science and Public Policy, 200915(2) with a special issue on "The Economic Impacts of the September 11, 2001, Terrorist Attacks."

many catastrophes" (see also Ripley 2008). As there is little research on the decision making process within extreme environments, that there is no best practice or base methodology. Included below is a discussion pertaining to commonly used methods in behavioural economics, laboratory experimentation and its close cousins from the field and nature. Additionally, there is an extended discussion about the use of the analytical narrative technique, which is likely to become a commonly used tool in the analysis of extreme environments.

While there already exists a considerable volume of research that examines conflict, it is predominantly focused on the causes or the mechanisms of conflict. Even so what experimental conflict research does exist is very much in its infancy and as yet there is no dedicated experimental design (Abbink 2012). What is missing is an understanding of the behaviour and decisions of the third parties, or those individuals caught within the conflict zones, i.e. those not directly taking action but are in effect the negative externalities of the conflict. This is where behavioural economics approach will be able to make a significant impact, through the implementation of the methodologies listed below. Active investigation of the decision process and the associated factors will enable better policies, through better modelling of movements and understanding of the decision process.

6 Experiments

Behavioural economics as a discipline is relatively young, when compared to mainstream fields like labor or industrial organisation. As a result it is expanding at a phenomenal rate and in the process is co-opting (introducing) many other disciplines into its theoretical frameworks: such as psychology, anthropology, sociology and neuroscience. The workhorse for revealing individual decision-making and preferences has been the laboratory experiment, delivered through a range of experiments or games. The lab is a highly controllable environment, enabling experimenters to control every variable and manipulate the one of interest and is very suitable for testing normal concepts and theories (List and Cherry 2008).

Abbink (2012) succinctly iterates when experimental methods should be applied: Firstly, to test theoretical models; Secondly, they can be a substitute for unavailable field data; and finally, the laboratory and field data can be gathered in parallel. The core of experimental economics is game theory, which is used to design and facilitate the structure of the experiments. It is a mathematical approach to analysing the nteractions and assumes the homo economicus model of player rationality (Camerer 2003; Camerer, Loewenstein, and Rabin 2004; Gintis 2009). This assumption is both the strength and weakness of game

theory in experiments, while rationality makes the games and interactions tractable, but it also results the abstract and non-realistic games. For some time researchers had little desire to step outside of the laboratory environment, but Amato (1990, 31) was critical of this stating: "Researchers who value the rigour of the laboratory have been reluctant to extend the study of pro-social behaviour to everyday life, where the possibility of control is minimal." However, research has recently begun doing this by viewing disaster events as natural experiments and examining the behaviour of individual within the events (see e.g. Frey, Savage, and Torgler 2010b; Savage and Torgler 2013). But they are prone to experimenter effects – this includes the so called *Hawthorne effect*.[13] An additional problem is that these experiments are performed in sterile, safe and non-natural environments that can provoke non-natural responses from participants.

This is where natural experiments come to the fore. Rosenzweig and Wolpin (2000) identify them as random treatment effects that have occurred naturally, whether through chance, luck or serendipity. They state that a major advantage is that these events "… provide almost perfect randomness" (Rosenzweig and Wolpin 2000, 828). Because they are naturally occurring and in a real environment, participants are not aware that their action can or will be observed, allowing them to behave in a manner that reveals their true preferences. Of course all economists know there is no such thing as a free lunch, everything comes at a cost and natural experiments are no different. The price that must be paid for randomness[14] and a real environment is an absolute lack of control by the experimenter! This can result in aspect of the experiment being less than desirable: missing data, a number of unobservables and simultaneous shifts of multiple variables to muddy the results. This approach can be observed in the studies by Frey, Savage, and Torgler (2010a,b), used the sinking of the Titanic and Lusitania as naturally occurring field experiments to investigate the decision process and determinants of survival. It provided evidence on how people react in a situation where there is an excess of demand due to the shortage of lifeboats, showing that helping behaviour is common and altruism or social and moral norms seem to play a central role in such a risky and extreme situation. Additionally, it indicated that time is needed

13 Is the impact of observation on the object of study, where the participants are aware that they are being observed and as a result alter their behaviour. The effect is named after the research location at the Hawthorne plant of the Western Electric Company, where studies were conducted to analyse links between productivity and light levels by Elton Mayo and Fritz Roethlisberger in the 1920s. The findings showed that workers increased output in response to both positive and negative changes in light, though to be due the knowledge of being observed.

14 "Randomness – the event or variable is orthogonal to the unobservable and unmalleable factors that could affect the outcomes under study" (Rosenzweig and Wolpin 2000).

for the deployment and adherence of social norms, the short run self-interested survival mechanisms, such as *fight and flight*, appear to be more prominent.

There is middle ground between the lack of realism in the lab and uncontrollability of nature, the field experiment. The field experiment can maintain the randomness of a natural event but retains a much greater level of control by the experimenter (Levitt and List 2009; Reiley and List 2007). In this approach, the experimenter enters the field to run some form of experiment, which maintains the real environment but has the advantage of having a prepared experiment. This method can be observed in the Page, Savage, and Torgler (2014), the experimenters ran risk experiments in the weeks following the devastating and widespread 2011 flooding that inundated the city of Brisbane (Australia). This field experiment utilised the naturally occurring disaster event to deliver an experimental decision game to participants in the field along the peak of the flood line.

The survey method is highly compatible with the use of field experiments, it can be simultaneously collected in the field and applied as an extension to the experimental data set. While these studies have long been utilised in the broader social sciences, they are often disregarded as an inferior data source by economists, but like any source the data is only as good as the methodology used to collect and analyse it. Poor methodology can result in issues like unrealistic findings, sampling biases, extrapolations from small populations, interviewer incentive bias (Spagat 2012), to outright corruption of the data. Surveys can often include standard psychology questions to identify an individual's emotional or psychological state of mind.[15] Field surveys are at the best of times an expensive procedure, as they usually require a team of individuals to travel into the study area, often stay for extended periods of time and employ interrupters or guides. This is compounded when we move into conflict zones, as they can be highly charged zones full of violence and uncertainty, where the safety of the researcher may not be guaranteed. As discussed above this is the most often cited reason for laboratory experiments. However, if one wants to obtain true behavioural insights from individuals in an extreme environment there is often no other choice but to go to the field. While the survey approach can be fruitful, one must be aware of the limitations of using such an approach in the estimation of casualties in conflict zones (Johnson et al. 2008; Spagat 2012).[16]

Analysis of one shot experiments or those that use cross sectional data do not suffer from participant attrition (drop outs), which is a major problem for

15 This can include the Big 5 personality (Barrick and Mount 1991; Eysenck 1991; Hough 1992), locus of control (Lefcourt 1991) or anxiety and depression (Bjelland et al. 2002; Clark and Watson 1991).

16 For an extended discussion see Asher (2009), Asher, Scheuren, and Banks (2008), Biemer and Lyberg (2003), Brunborg, Tabeau, and Urdal (2006), Rosenblum and van der Laan (2009), Spagat (2009).

research studies that run longitudinally and has the potential to create a significant bias in the results. This is especially true if those dropping out of the study have similar but unobserved characteristics or reasons. While this can also be problematic for laboratory experiments, it is less so with repeated experiments and large enough subject pools. However, this could be an issue when we analyse extreme environments (disasters or conflict) where attrition rates can still cause bias, but here the participants may not just be leaving the study, they may be dying. This could potentially cause two problems: Firstly, we may have a survivor bias, i.e. the exclusion of those who perished during the event not being represented in the sample. This means that at best the results will be only valid for that particular group of interviewed survivors and not generalisable to population. Secondly, these are natural and catastrophic events, which cannot (and not likely) be repeated; it is generally a one shot game without the ability to utilise many of the controls we use in the lab. An additional issue that must be considered is the extreme nature of the experimental space, participants are faced with decisions that can have grave consequences which could include the abandonment, death or separation of family members. In order to elicit a realistic response from experimental participants the laboratory environment would need to (re) create a similar and believable extreme high-stress environment. No only is is this extremely difficult, but to do so would call into question the ethical responsibility of the researchers. There has been famous historically examples of researchers creating simulated or realistic experimental conditions, which resulted in either physical or psychological harm to participants. For example, Zimbardo (1971) recreated a prison environment into which they assigned experimental subjects (students) as either prisoners or guards, which caused extreme distress for the prisoners when brutalised by the guards. The PhD thesis of Howard (1966) threatened to electrocute his participants (female students) if they failed to escape from his experiment. The prison experiments and the ground breaking experiments run Milgram (1963) and Milgram and van Gasteren (1995) become one the main reasons for the creation of ethical guidelines in research.

7 Narrative analysis

Given the inherent difficulties[17] associated with collecting good solid first hand data, as the data may not have been collected for statistical analysis, not all

17 Conflict and war zones are extremely dangerous and often difficult to get on the ground to collect data, making it necessary to find a safer alternative.

pertinent data may have been collected at the time and it is highly likely that there are data gaps and unobservables. Additionally, it may be of interest to investigate past conflicts in order to gain insight into the behavioural patterns of individuals during these events, here additional data is not longer able to be collected. This can be problematic as the available records are outcomes rather than direct observation of the event. This means we are only able to create estimates on the available data, which are generally collected ex post, making any additional collection very difficult to obtain and most likely subject to bias.[18] Fortunately, there is an alternative approach that helps to compensate for these information imperfections, an analytical narrative which ties together both the available data and the anecdotal evidence.

In this setting an analytical narrative approach can be used in order to overcome some of these issues and construct an analysis that would have been impossible from the data alone, to explore both formal and explicit questions (Bates et al. 1998, 10). This form of analysis enables the researcher to understand the attitudes, beliefs and preferences of the individuals, as well as the potential constraints on actions (Bates et al. 1998, 11). While considering the impact of strategic interactions, beliefs, cultural features and social structures on behavior using, for example, a classical game theoretic [or a behavioural] approach (Greif 1998; Greif and Laitin 2004). The approach is "analytic in that it extracts explicit and formal lines of reasoning, which facilitate both exposition and explanation" (Bates et al. 1998). While the analysis is not specifically theory driven, it does provide insights about the behaviour and outcomes from a particular situation with specific characteristics, giving insight into the *why* of specific behaviours.

We can see this method in Savage and Torgler (2015), which investigates the historical development and nature of the social values and norms climbers in the Himalaya over a 60-year period and the extent to which these norms were maintained over time. The analysis used many detailed sources on mountaineering, paying specific attention to Everest and the Himalaya. This was seeking to understand preferences, perceptions, information they possess, evaluation of alternatives, expectations, strategies they adopt, and any constraints or limitations. The use of empirical data and anecdotal evidence together contribute to a better understanding of particular events, increasing the ability for analysis where data is limited or incomplete and opening an avenue for exploration that would otherwise be closed.

18 This form of data collection can suffer from a survivor bias, such that only those remaining alive are available to give any additional information; or the information could be subject to an ex post rationalisation process, in an attempt to make the actions of individuals seem better than they may have actually been.

8 Discussion

Approaching the study of conflict from a behavioural economics viewpoint[19] will generate a wealth of knowledge and understanding that can be extended to other generalised environments, such as terrorism, riots, civil unrest and feedback into natural disasters. In all of these environments, as with conflict zones, we have a need to deliver aid, assistance and resources in a timely (lifesaving) fashion. Not only can the study of conflicts facilitate a better understanding of the decision-making and environment, but will allow for the creation of better modelling based on factual evidence not assumptions or myth.

> *"Disaster planning is only as good as the assumptions it is based upon. Unfortunately this planning is often based upon a set of conventional beliefs that have been shown to be inaccurate or untrue when subjected to empirical analysis […] It is more efficient to learn what people tend to do naturally in disasters and plan around that, rather than design your plan and then expect people to conform to it"* (Heide 2004, 340).

The majority of current policy is still based upon the model of panic, contrary to all available evidence; therefore we need better models of human behaviour in these extreme environments if we are to be able to predict movements or motivations. We need to show that mass panic is the rarity it truly is, which will in turn force a revaluation of public policy models that reflect reality and highlight the situation and environments where such panic can and does happen. It is important to acknowledge that not only external factors influence behaviour or decision-making, but also the internal. An individual's identity or the groups to which they belong are likely to have significant impact on these processes and it is of interest to investigate if or how it impacts on behaviour.

By adopting the behavioural and experimental methodology we will be able to directly apply Simon (1987) advice and address some of these issues and shortcomings by providing empirical evidence with which we can guide policy. The experimental approach should not be adopted as a one size fits all or one shot game, where we conduct only a single field, laboratory or natural experiment. The findings of one should be verified by the results from another type, i.e. a laboratory experiment should not be verified by another laboratory experiment, but with a field (or natural) experiment. The experimental approaches are complementary in so much that the strengths and weaknesses of each are negatively correlated. The weakness of one type is the strength of another and vice versa.

19 The following books are an easy entry point into the world of behavioural economics *Predictably Irrational* (Ariely 2008), *Thinking Fast and Slow* (Kahneman 2011), *Nudge* (Thaler and Sunstein 2008), and *Freakonomics* (Dubner and Levitt 2005).

While laboratory experiments lack the realism of a high stress, life-and-death environment, they excel by being able to ensure control and isolate the factor of interest. This control is limited in the field, where we suffer from noise and may have unobservable variables simultaneously affecting the factor of interest. However, field experiments are able to engage in a natural setting with some control rigour. Of course field experiments suffer from far greater issues: Firstly, it likely to be difficult if not dangerous for the researcher to be in the field during or immediately following these events. But is likely generate the most complete data especially if it could be collected inter-temporally; and Secondly, it can be very expensive to get into the field to run experiments and collect data. This where the importance of the natural experiment becomes obvious, they are real environments, where individuals act in a normal manner without any observer effects, but they suffer from a complete lack of control from the experimenter. In recent years there has been an increase in the use of internet based data collection for research, most notably in the experimental domain (see e.g. Rubinstein 2013). This approach is blurring the distinctions between laboratory and field experiments, individuals can participate in the experiments from remote locations (e.g. home, university, work, etc.). Although this approach does cause concern with some of the experimental community on the grounds that participant conditions are not standardised and they are not cash incentivised which has long been a standard of economic experiments. It may be possible to leverage off the online delivery to facilitate the running of experiments in these dangerous regions.[20]

A potential avenue through with to approach field work may be to do so post event, while this is likely to be a much safer prospect there is a risk that it will suffer from bias due to large number missing individuals (deaths). Alternatively, it may be of great interest running experiments in refugee camps, while there may be a high level of bias as it only captures those who fled it is likely to be the best and only source of valid data. While this approach could identify similarities amongst the refugees, there is no obvious control group making it difficult to generalise to a wider population. A solution could be the synthetic control group, i.e. creating an artificial control group out of the population at hand (Abadie, Diamond, and Hainmueller 2010; Chan et al. 2014). As is often the case with research into the human condition and especially in extreme circumstances or situations, questions of ethics and morality should be raised. One must closely examine how we approach the participants is this field of study, while the immediacy of events will undoubtedly provide the most authentic data, we must question the stress it

20 I believe that being physically present when running the experiments results in insights that could not be gained in any other manner, this is true whether in a laboratory or in the field (say at 5000 m).

could cause to individual who have already undergone such extremely traumatic upheavals. This is, as they say, where the rubber meets the road. Science only moves forward if we push and ask the difficult questions, but we have responsibility to our fellow man not to exacerbate their distress. Therefore this process should be carried out with the upmost care for the vulnerable. As such it may be the case that the best option at our disposal is the narrative analysis, where we are able to match the less than perfect data to the anecdotal evidence without causing further distress. This reduces the danger of being in the field during the event, utilises all available data and matches the written evidence of those who survived the experience.

9 Conclusion

We have a need to understand the decisions made by individuals in conflict and war zones, as they can have a significant effect on the probability of survival. This is where behavioural economics can be applied in the pursuit of scientific knowledge, to debunk fallacies and create better policies in this extreme environment and those like it (disasters, terrorism, civil unrest, etc.). Using a systematic experimental approach which uses the complementarity of the strengths of each will ensure the best possible research outcomes.

One of the most unproductive elements of conflict is the destruction of human and social capital, through the intentional or unintentional impacts on civilians and non-combatants, i.e. those caught inside the conflict zones. One of the knock-on effects of dislocation are the vast sums of money spent aiding victims or the actions to protect the vulnerable. Societies that suffer from large population losses due to war take extended periods to recover stability and economic growth, which can often lead to the outbreak of further conflict. In line with this, understanding how individuals behave and the decisions they face within conflict zones, may enable us to limit potential future conflict, losses of human life and deliver aid efficiently. A failure to understanding behaviour within these environments maintains the status quo, where we will be unable to provide little more than our current efforts for the flotsam and jetsam left in the wake of this destructive man made disaster.

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Appendix

The identity/utility model begins with a simplified utility model built on a unit of effort (e_i), where the effort exerted by individual (i) forms the basis of the individuals level of skill K (e_i), which is a fraction of some level of effort. The interaction of skill and effort level with a wage rate per unit of effort provides the utility payoff for that individual:

$$U_i = U_i(\omega \cdot K(e_i), e_i) \tag{1}$$

Next we include the Akerlof and Kranton (2000) concept of identity, such that each individual will see themselves as being part of a specific group, utility can be gained or lost depending on how closely the individual (i) matches the identity of the ideal member of the group with which they identify.

$$I_i = I_i(e_i, c_i, \epsilon_i, P) \tag{2}$$

where I_i is the level of self-image of individual (i), is a function such that (c_i) describes the group to which the individual belongs, ϵ_i describes the characteristics of individual (i), who would nominally follow a set of prescription (norms) belonging to that group. Now I_i represents how closely individual (i) conforms to the ideal, which includes the effort level and characteristics of the individual to act in accordance to the group ideals. Now if we return to the utility function (1) and include the group identity functions (2) we derive the new utility function (3).

$$U_i = U_i(\omega \cdot K(e_i), e_i, I_i) \tag{3}$$

Utility is now not only a function of effort, but with the additional dimension of identity it can increase or decrease an individuals payoff depending on how well they identify with the ideal member of their own group. This indicates that individuals, who do not conform to the ideal expectations, either through low effort or through non-compliance of social normative behaviours, would suffer from a decrease in utility.

If we consider the situation where an individual identifies with two groups: A has pro-social behaviours of a=1 and B has self-interested behaviours of b=1. The prescriptions P dictate the ideal level of effort for each of the group types, such that $eA > eB$, on the assumption that it takes more effort to be prosocial than self-interested. When these identities are in conflict the individual loses utility for deviations away from the prescribed level of effort for each group at a rate of $\frac{1}{2}(e_i - e(c_i))^2$.

$$U_i(A)=p\left[\omega\cdot k_i-\frac{1}{2}(e_i^2)\right]+(1-p)\left[I_A-t(1-b_i)-\frac{1}{2}(e_i-e(A))^2\right] \quad (4)$$

$$U_i(B)=p\left[\omega\cdot k_i-\frac{1}{2}(e_i^2)\right]+(1-p)\left[I_B-t(1-s_i)-\frac{1}{2}(e_i-e(B))^2\right] \quad (5)$$

Here (t) is the measure of difference of the individual (i) from the ideal member of that individuals group and (p) denotes the weighting of the pecuniary benefits and costs of the effort expended such that $0\leq p\leq 1$. An individual who is only concerned about themselves would have a (p) value approaching $p=1$, alternatively for an individual concerned about others and pro-social behaviour would observe a (p) value approaching $p=0$.

As such individuals who identify with only one group are less likely to suffer from utility loss as a result of conflicting ideals and behaviours. However, while individuals that identity with multiple groups may suffer from utility loss when the identities are in conflict, it is likely that they will generate much higher levels of utility from the aggregate of identities if they are closely aligned or conflict is minimal. In this sense pluralism can cause higher levels of cognitive dissonance if/when in conflict, but result in higher levels of overall utility, where as singular identities create less dissonance but also result in lower levels of overall utility.

References

Abadie, A., Diamond, A., Hainmueller, J., (2010), Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program, Journal of the American Statistical Association, vol. 105, no. 490, pp. 493–505.

Abbink, K., (2012), Laboratory Experiments on Conflict, in Garfinkel, M.R., Skaperdas, S., (eds.), The Oxford Handbook of the Economics of Peace and Conflict, chapter 22, Oxford University Press, pp. 532–555.

Aguirre, B.E., Wenger, D., Vigo, G., (1998), A Test of the Emergent Norm Theory of Collective Behavior, Sociological Forum, vol. 13, no. 2, pp. 301–319.

Akerlof, G.A., Kranton, R.E., (2000), Economics and Identity, The Quarterly Journal of Economics, vol. 115, no. 3, pp. 715–753.

Akerlof, G.A., Kranton, R.E., (2002), Identity and Schooling: Some Lessons for the Economics of Education, Journal of Economic Literature, vol. 40, no. 4, pp. 1167–1201.

Akerlof, G.A., Kranton, R.E., (2005), Identity and the Economics of Organizations, The Journal of Economic Perspectives, vol. 19, no. 1, pp. 9–32.

Albala-Bertrand, J., (1993), The Political Economy of Large Natural Disasters: With Special Reference to Developing Countries, Clarandon Press, Oxford.

Amato, P.R., (1990), Personality and Social Network Involvement as Predictors of Helping Behavior in Everyday Life, Social Psychology Quarterly, vol. 53, no. 1, pp. 31–43.

Ariely, D., (2008), Predictably Irrational, Harper Collins, New York.
Asher, J., (2009), Developing and using Surveys to Estimate Casualties Post-Conflict: Developments for the Developing World. In International Conference on Recording and Estimation of Casualties, Carnegie Mellon University and University of Pittsburgh.
Asher, J., Scheuren, F., Banks, D., (2008), Statistical Methods for Human Rights, Springer, Dordrecht.
Balcells, L., (2010), Rivalry and Revenge: Violence against Civilians in Conventional Civil Wars, International Studies Quarterly, 54, no. 2, pp. 291–313.
Balcells, L., (2011), Continuation of Politics by Two Means: Direct and Indirect Violence in Civil War, Journal of Conflict Resolution, vol. 55, no. 3, pp. 397–422.
Banerjee, A.V., (1992), A Simple Model of Herd Behavior, The Quarterly Journal of Economics, vol. 107, no. 3, pp. 797–817.
Barrick, M., Mount, M., (1991), The Big Five Personality Dimensions and Job Performance: A Meta-Analysis, Personnel Psychology, vol. 44, pp. 1–26.
Bates, R.H., Greif, F.A., Levi, M., Rosenthal, J.L., Weingast, B.R., (1998), Analytic Narratives, Princeton University Press, Princeton.
Becker, G.S., (1976), The Economic Approach to Human Behavior, Chicago University Press, Chicago.
Beraldo, S., Caruso, R., Turati, G., (2013), Life is Now! Time Preferences and Crime: Aggregate Evidence from the Italian Regions, The Journal of Socio-Economics, vol. 47, pp. 73–81.
Biemer, P., Lyberg, L., (2003), Introduction to Survey Quality, Wiley, Hoboken New Jersey.
Bjelland, I., Dahl, A.A., Haug, T.T., Neckelmann, D., (2002), The Validity of the Hospital Anxiety and Depression Scale: An Updated Literature Review, Journal of Psychosomatic Research, vol. 52, no. 2, pp. 69–77.
Brown, R., (1954), Mass Phenomena, in Lindzey, G., (ed.), Handbook of Social Psychology, volume 2, Addison-Wesley, Reading, 1 edition.
Brunborg, H., Tabeau, E., Urdal, H., (eds.), (2006), The Demography of Armed Conflict, Springer, Dordrecht.
Camerer, C.F., (2003), Behavioral Game Theory: Experiments in Strategic Interaction, Princeton University Press, Princeton.
Camerer, C.F., Loewenstein, G., Rabin, M., (2004), Advances in Behavioral Economics, Princeton University Press, Princeton.
Caruso, R., (2016), Identity and Incentives: An Economic Interpretation of the Holocaust, in Economic Aspects of Genocides, Mass Atrocities, and Their Prevention, Oxford University Press, New York.
Chan, H.F., Frey, B.S., Gallus, J., Torgler, B., (2014), Academic Honors and Performance, Labour Economics, vol. 31, pp. 188–204.
Charness, G., Gneezy, U., Imas, A., (2013), Experimental Methods: Eliciting Risk Preferences, Journal of Economic Behavior & Organization, vol. 87, pp. 43–51.
Clark, L.A., Watson, D., (1991), Tripartite Model of Anxiety and Depression: Psychometric Evidence and Taxonomic Implications, Journal of Abnormal Psychology, vol. 100, no. 3, pp. 316–336.
Dacy, D., Kunreuther, H., (1969), The Economics of Natural Disasters: Implications for Federal Policy, Free Press, New York.
De Alessi, L., (1975), Towards an Analysis of Post-Disaster Cooperation. American Economic Review, vol. 65, no. 1, pp. 127–138.
Drabek, T., (1986), Human System Responses to Disaster: An Inventory of Sociological Findings, Springer, New York.

Dubner, S.J., Levitt, S., (2005), Freakonomics: A Rogue Economist Explores the Hidden Side of Everything, Penguin Books Ltd, London.
Elster, J., (1985), Sour Grapes: Studies in the Subversion of Rationality, Cambridge University Press, Cambridge.
Elster, J., (2007), Explaining Social Behavior. More Nuts and Bolts for the Social Sciences, Cambridge University Press, Cambridge.
Eysenck, H.J., (1991), Dimensions of Personality: 16, 5 or 3? – Criteria for a Taxonomic Paradigm, Personality and Individual Differences, vol. 12, no. 8, pp. 773–790.
Falk, A., Fehr, E., Fischbacher, U., (2008), Testing Theories of Fairness–Intentions Matter, Games and Economic Behavior, vol. 62, no. 1, pp. 287–303.
Fehr, E., Gächter, S., (2000), Fairness and Retaliation: The Economics of Reciprocity, Journal of Economic Perspectives, vol. 14, no. 3, pp. 159–181.
Fehr, E., Schmidt, K.M., (1999), A Theory of Fairness, Competition, and Cooperation, Quarterly Journal of Economics, vol. 114, no. 3, pp. 817–868.
Festinger, L., (1962a), Cognitive Dissonance, Scientific American, vol. 207, no. 4, pp. 93–107.
Festinger, L., (1962b), A Theory of Cognitive Dissonance, volume 2, Stanford University Press, Stanford.
Frederick, S., Loewenstein, G., O'Donoghue, T., (2002), Time Discounting and Time Preference: A Critical Review, Journal of Economic Literature, vol. 40, pp. 351–401.
Frey, B.S., Savage, D.A., Torgler, B., (2010a), Interaction of Natural Survival Instincts and Internalized Social Norms Exploring the Titanic and Lusitania Disasters, Proceedings of the National Academy of Sciences, vol. 107, no. 11, pp. 4862–4865.
Frey, B.S., Savage, D.A., Torgler, B., (2010b), Noblesse Oblige? Determinants of Survival in a Life and Death Situation, Journal of Economic Behavior and Organization, vol. 74, no. 1, pp. 1–11.
Frey, B.S., Savage, D.A., Torgler, B., (2011), Who Perished on the Titanic? The Importance of Social Norms, Rationality & Society, vol. 23, no. 1, pp. 35–49.
Fritz, C., Williams, H.B., (1957), The Human Being in Disasters: A Research Perspective, The Annals, pp. 42–51.
Gintis, H., (2009), The Bounds of Reason: Game Theory and the Unification of the Behavioral Sciences, Princeton University Press.
Goldthorpe, J.H., (1998), Rational Action Theory for Sociology, The British Journal of Sociology, vol. 49, no. 2, pp. 167–192.
Greif, A., (1998), Historical and Comparative Institutional Analysis, The American Economic Review, vol. 88, no. 2, pp. 80–84.
Greif, A., Laitin, D.D., (2004), A Theory of Endogenous Institutional Change, American Political Science Review, vol. 98, no. 4, pp. 633–652.
Grossi, P., Kureuther, H., (eds.), (2005), Catastrophe Modeling. A New Approach to Managing Risk, Springer, New York.
Gutman, R., Rieff, D., Dworkin, A., (eds.), (2007), Crimes of War: What the Public Should Know, Norton and Company, New York and London.
Gwynne, S., Galea, E.R., Lawrence, P.J., (2006), The Introduction of Social Adaption within Evacuation Modeling, Fire and Materials, vol. 30, no. 4, pp. 285–309.
Hancock, P.A., Szalma, J.L., (2008), Performance under Stress, Ashgate, Farnham.
Heckathorn, D.D., (1989), Collective Action and the Second-Order Free-Rider Problem, Rationality and Society, vol. 1, no. 1, pp. 78–100.
Heide, E.A.d., (2004), Common Misconceptions about Disasters: Panic, the "Disaster Syndrome", and Looting, in O'Leary, M., (ed.), The First 72 Hours: A Community Approach to Disaster Preparedness, iUniverse Publishing, Lincoln, pp. 340–380.

Hirshleifer, J., (1963), Disaster and Recovery: A Historical Survey, Technical report, Rand Corporation Memorandum.
Hough, L., (1992), The 'Big Five' Personality Variables – Construct Confusion: Description Versus Prediction, Human Performance, vol. 5, pp. 139–155.
Howard, R., (1966), Life and Death Decision Analysis, PhD thesis, Stanford University.
Huxley, A., (1937), Olive Tree, Harper and Brothers, New York.
Johnson, N., Spagat, M., Gourley, S., Onnela, J., Reinert, G., (2008), Bias in Epidemiological Studies of Conflict Mortality, Journal of Peace Research, vol. 45, no. 5, pp. 653–663.
Johnson, N.R., (1988), Fire in a Crowded Theater: A Descriptive Analysis of the Emergence of Panic, International Journal of Mass Emergencies and Disaster, vol. 6, no. 1, pp. 7–26.
Johnson, N.R., Feinberg, W.E., Johnston, D.M., (1994), Microstructure and Panic: The Impact of Social Bonds on Individual Action in Collective Flight from the Beverly Hills Supper Club fire, in Dynes, R., Tierney, K.J., (eds.), Disasters, Collective Behavior and Social Organizations, University of Delaware Press, Newark, pp. 168–189.
Johnston, J.H., Poirer, J., Smith-Jentsch, K.A., (1998), Decision Making under Stress: Creating a Research Methodology, in Cannon-Bowers, J.A., Salas, E., (eds.), Decision Making Under Stress, American Psychological Association, Washington, DC, pp. 39–60.
Kahneman, D., (2003), Maps of Bounded Rationality: Psychology for Behavioral Economics, American Economic Review, vol. 93, no. 5, pp. 1449–1475.
Kahneman, D., (2011), Thinking Fast and Slow, Macmillan, New York.
Kahneman, D., Tversky, A., (1979), Prospect Theory: An Analysis of Decision Under Risk, Econometrica, vol. 47, no. 2, pp. 263–291.
Kahneman, D., Tversky, A., (1992), Advances in Prospect Theory: Cumulative Representation of Uncertainty, Journal of Risk and Uncertainty, vol. 5, no. 4, pp. 297–323.
Kalyvas, S.N., (2005), Warefare in Civil Wars, in Duyvesteyn, I., Angstrom, J., (eds.), Rethinking the Nature of War, chapter 4, Psychology Press, London.
Kunreuther, H., (1996), Mitigating Disaster Losses through Insurance, Journal of Risk and Uncertainty, vol. 12, no. 2, pp. 171–187.
Kunreuther, H., Pauly, M., (2005), Insurance Decision Making and Market Behavior, Microeconomics, vol. 1, no. 2, pp. 63–127.
Kunreuther, H., Roth, R., (1998), Paying the Price: The Status and the Role of Insurance against Natural Disaster in the United States, John Henry Press, Washington.
Laibson, D., (1997), Golden Eggs and Hyperbolic Discounting, Quarterly Journal of Economics, vol. 112, pp. 443–477.
Larsdotter, K., (2005), New Wars, Old Warfare? Comparing US Tactics in Vietnam and Afghanistan, in Duyvesteyn, I., Angstrom, J., (eds.), Rethinking the Nature of War, chapter 6, Psychology Press, London.
Lefcourt, H.M., (1991), Locus of Control, in Robinson, J.P., Shaver, P.R., Wrightsman, L.S., (eds.), Measures of Personality and Social Psychological Attitudes, volume 1, chapter 9, Academic Press, pp. 413–499.
Lerner, J.S., Keltner, D., (2000), Beyond Valence: Toward a Model of Emotion-Specific Influences on Judgment and Choice, Cognition and Emotion, vol. 14, pp. 473–493.
Levitt, S.D., List, J.A., (2009), Field Experiments in Economics: The Past, the Present and the Future, European Economic Review, vol. 53, no. 1, pp. 1–18.
List, J.A., Cherry, T.L., (2008), Examining the Role of Fairness in High Stakes Allocation Decisions, Journal of Economic Behavior & Organization, vol. 65, no. 1, pp. 1–8.
Mawson, A.R., (1978), Panic Behavior: A Review and New Hypothesis, In 9th World Congress of Sociology, Uppsala, Sweden.

Mawson, A.R., (1980), Is the Concept of Panic Useful for Study Purposes? in Levin, B., (ed.), Behavior in Fires, National Fire Protection Agency, Boston, pp. 208–211.
Mawson, A.R., (2005), Understanding Mass Panic and Other Collective Responses to Threat and Disaster, Psychiatry, vol. 68, no. 2, pp. 95–113.
Mawson, A.R., (2007), Mass Panic and Social Attachment: The Dynamics of Human Behavior, Aldershot, Ashgate.
Milgram, S., (1963), Behavioral Study of Obedience, The Journal of Abnormal and Social Psychology, vol. 67, no. 4, pp. 371.
Milgram, S.,van Gasteren, L., (1995), Das Milgram-Experiment, Rowohlt, Hamburg.
Mintz, A., (1951), Non-Adaptive Group Behavior, Journal of Abnormal Psychology, vol. 46, no. 2, pp. 150–159.
Page, L., Savage, D.A., Torgler, B., (2014), Variation in Risk Seeking Behaviour following Large Losses: A Natural Experiment, European Economic Review, vol. 71, pp. 121–131.
Parsons, T., (1964), The Social System, Routledge and Paul Kegan, London.
Pratt, J.W., (1964), Risk Aversion in the Small and in the Large, Econometrica, vol. 32, no. 1–2, pp. 122–136.
Prince, S.H., (ed.), (1920), Catastrophe and Social Change, volume 94 of Studies in History, Economics and Public Law. P.S. King & Son Ltd, London.
Quarantelli, E.L., (1960), Images of Withdrawal Behavior in Disasters: Some Basic Misconceptions, Social Problems, vol. 8, no. 1, pp. 68–79.
Quarantelli, E.L., (1972), Study and Research in the United States, in Proceedings of Organizational and Community Response to Disasters, volume Book and monograph No 8, Disaster Research Center, The Ohio State University, Columbus.
Quarantelli, E.L., (2001), The Sociology of Panic, in Baltes, S. a., (ed.), International Encyclopedia of the Social and Behavioral Sciences. Pergamon Press, London, 30th edition.
Rabin, M., (2000), Risk Aversion and Expected-Utility Theory: A Calibration Theorem, Econometrica, vol. 68, no. 5, pp. 1281–1292.
Reiley, D.H., List, J.A., (2007), Field Experiments in Economics, in Durlaf, S.N., Blume, L.E., (eds.), The New Palgrave Dictionary of Economics, Palgrave Macmillian, London, 2nd edition.
Ripley, A., (2008), The Unthinkable: Who Survives When Disaster Strikes – and Why? Random House, London.
Rosenblum, M., van der Laan, M., (2009), Confidence Intervals for the Population mean Tailored to Small Sample Sizes, with Applications to Survey Sampling, International Journal of Biostatistics, vol. 5, no. 1, pp. 1–46.
Rosenboim, M., Ben-Zion, U., Shahrabani, S., Shavit, T., (2012), Emotions, Risk Perceptions and Precautionary Behavior under the Threat of Terror Attacks: A Field Study among Israeli College Students, Journal of Behavioral Decision Making, vol. 25, pp. 248–256.
Rosenkoetter, M.M., Covan, E.K., Cobb, B.K., Bunting, S., Weinrich, M., (2007), Perceptions of Older Adults Regarding Evacuation in the Event of a Natural Disaster, Public Health Nursing, vol. 24, no. 2, pp. 160–168.
Rosenzweig, M.R., Wolpin, K.I., (2000), Natural "Natural Experiments" in Economics, Journal of Economic Literature, vol. 38, no. 4, pp. 827–874.
Rubinstein, A., (1998), Modeling Bounded Rationality, MIT Press, Cambridge.
Rubinstein, A., (2013), Response Time and Decision Making: An Experimental Study, Judgment and Decision Making, vol. 8, no. 5, pp. 540–551.

Savage, D.A., Torgler, B., (2010), Fairness and Allocations Systems, Economic Analysis and Policy, vol. 40, no. 2, pp. 229–248.
Savage, D.A., Torgler, B., (2013), The Emergence of Emotions and Religious Sentiments during the September 11 Disaster, Motivation and Emotion, vol. 37, no. 3, pp. 586–599.
Savage, D.A., Torgler, B., (2015), The Times they are a Changin': The Effect of Institutional Change on Cooperative Behaviour at 26,000 ft over Sixty Years, Palgrave McMillian, Hampshire.
Shahrabani, S., Benzion, U., Rosenboim, M., Shavit, T., (2012), Does Moving from War Zone Change Emotions and Risk Perceptions? A Field Study of Israeli Students, Judgment and Decision Making, vol. 7, no. 5, pp. 669–678.
Simon, H., (1957), Models of Man, Social and Rational: Mathematical Essays on Rational Human Behavior in a Social Setting, chapter A Behavioral Model of Rational Choice, Wiley, New York.
Simon, H., (1991), Bounded Rationality and Organizational Learning, Organization Science, vol. 2, no. 1, pp. 125–134.
Simon, H.A., (1956), Rational Choice and the Structure of the Environment, Psychological Review, vol. 63, no. 2, pp. 129–138.
Simon, H.A., (1987), Behavioural Economics. The New Palgrave: A Dictionary of Economics, vol. 1, pp. 221–224.
Smith, J.E., Keeney, R.L., (2005), Your Money or Your Life: A Prescriptive Model for Health, Safety and Consumption Decisions, Management Science, vol. 51, no. 9, pp. 1309–1325.
Sorkin, A.L., (1982), Economic Aspects of Natural Disasters, Lexington Books, Lexington.
Spagat, M., (2009), The Reliability of Cluster Surveys of Conflict Mortality: Violent Deaths and Non-Violent Deaths, in International Conference on Recording and Estimation of Casualties, Carnegie Mellon University and University of Pittsburgh.
Spagat, M., (2012), Estimating the Human Costs of War: The Sample Survey Approach, in Garfinkel, M.R., Skaperdas, S., (eds.), The Oxford Handbook of the Economics of Peace and Conflict, chapter 14, Oxford University Press, pp. 318–340.
Thaler, R., Sunstein, C.R., (2008), Nudge: Improving Decisions About Health, Wealth and Happiness, Yale University Press, New Haven.
Tierney, K.J., Lindell, M.K., Perry, R.W., (2001), Facing the Unexpected, Joseph Henry Press, New York.
Wakker, P., (2010), Prospect Theory: For Risk and Ambiguity, Cambridge University Press, Cambridge.
Zimbardo, P.G., (2007), The Lucifer effect: Understanding How Good People Turn Evil, Taylor & Francis, New York.