

# Natural disasters, entrepreneurship, and creation after destruction

## A conceptual approach

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### Abstract

**Purpose** – The purpose of this paper is to contribute a deeper understanding of how natural disasters influence entrepreneurial intentionality as an important antecedent of entrepreneurial intention. It reviews the conceptual and operational backgrounds of natural disaster research and entrepreneurship theories and formulates a distinctive conceptual approach to entrepreneurial intentions in natural disaster settings.

**Design/methodology/approach** – An exhaustive review of research articles published in peer-reviewed entrepreneurship journals is provided and focuses on entrepreneurship, natural disasters, and entrepreneurial opportunities.

**Findings** – Six propositions about the influence of natural disasters on entrepreneurial intentions in ways that are distinct to the specific circumstances of post-disaster environments.

**Research limitations/implications** – The paper's findings serve as a useful foundation for future research of post-disaster entrepreneurial behavior. The propositions highlight the relationship between opportunities, self-efficacy, feasibility, desirability, fear of failure, and resilience that complement macro-level research with micro-level antecedents. Implications entail new methodological avenues for future studies of humanitarian and post-disaster entrepreneurial activities.

**Practical implications** – This paper suggests ways in which public policy and educational, state and community programs can be designed and executed so that entrepreneurial intentions are developed and entrepreneurial action is not hindered. Moreover, it clarifies several ways to achieve more effective action (or inaction) to serve those affected by natural disasters and minimize disaffection.

**Originality/value** – The study illustrates that natural disasters can and do create opportunities for entrepreneurial behavior even as they generate powerful and sweeping negative effects on socioeconomic systems. Its unique approach explores individual-level variables concerning intent and motivation that drive entrepreneurial decisions in disaster contexts.

**Keywords** Creative destruction, Entrepreneurial intentions, Natural disasters, Entrepreneurial opportunities, Entrepreneurial action

**Paper type** Conceptual paper

### Introduction

Data from the most current world disaster report indicate that in 2014 there were 315 natural disasters and these incidents caused the death of more than 8,000 human beings (Ager *et al.*, 2015). The events in question spanned 94 countries and affected over 106 million people overall. In a year not considered atypical, the disaster events of 2014 accounted for \$99 billion in property and collateral damages, along with immeasurable negative effects on the development of local and global socioeconomic systems.

Whereas entrepreneurship research has historically focused on economic and social development, job creation, and innovation (Ucbasaran *et al.*, 2013), its vital function and its increased intensity in adverse or dangerous contexts have merely been assumed tacitly. Indeed, the role that entrepreneurship can play in rebuilding the infrastructure and economies of affected communities, supporting local government agencies and non-government organizations (NGOs), and creating sustainable, long term and resilient organizations after a natural disaster is under-researched (Bullough *et al.*, 2014). Thus there



is a need for better understanding of how entrepreneurial activity relates to the large number of natural disasters that occur around the world each year.

A systematic and representative search of articles published in peer-reviewed journals, including “the Big 5” (Katz, 2016) entrepreneurship journals: *Entrepreneurship and Regional Development*, *Entrepreneurship: Theory and Practice*, *Journal of Business Venturing*, *Journal of Small Business Management*, and *Small Business Economics* indicated that while there is a small number of scholars who have begun to examine potential relationships between disasters and entrepreneurship, the vast majority focus on how natural disasters affect existing small businesses (Irvine and Anderson, 2004), their response, and what variables improve the odds of their survival (Linnenluecke and Griffiths, 2010) and recovery (Winn *et al.*, 2011).

This paper proposes that the study of the effect of natural disasters as a source of new entrepreneurial opportunities and increased entrepreneurial intentions holds great promise for a better understanding of entrepreneurship’s function in society. Certainly there are many real-world examples of new ventures facilitating, encouraging, and accelerating the rebuilding of affected post-disaster community environments. The research, however, lags behind the practical reality. While it is indeed vital to understand how entrepreneurial ventures can survive natural disasters, it is also vital to formulate new conceptualizations of natural disasters as sources of innovative ideas and ventures. Before now such question has been virtually ignored (Monllor and Altay, 2016).

This work reviews and examines the conceptual background of natural disasters and entrepreneurial activity and formulates an approach to understanding natural disasters as a kind of impetus for transforming entrepreneurial intentions into behaviors. Our contribution serves as a foundation for future studies and can shape policy that supports and encourages small business activity in natural disaster contexts. This study heralds a unique approach, as it explores individual-level variables regarding entrepreneurial intentions as well as the motivational processes that drive entrepreneurial decisions in such settings.

## Review and conceptual background

Natural disasters are defined as the “impact of an extreme natural event on an exposed, vulnerable society” (Mechler, 2003). When the impact of a given natural disaster exceeds the capacity of the affected region to cope or respond such that interregional or international assistance becomes necessary, then the case approximates the definition of full-blown natural disaster. The impact of such events is not only limited to people and firms in the affected region (Miller, 1992). In fact, in today’s socioeconomic systems, where market and supply networks are global and virtual in nature, disasters in one region can and do have substantial and extended consequences (Altay and Ramirez, 2010; Gassebner *et al.*, 2006; Wagner and Bode, 2006).

In 2014 alone there were a reported 324 natural disasters which caused the death of 7,823 people, victimized 140.7 million, and caused 99.2 billion dollars in damages across 99 countries. Of these, approximately 90.1 percent were climate-related extreme weather events: hydrological, meteorological, and climatological (Guha-Sapir *et al.*, 2014). These numbers call for a changed focus in strategic planning and management, one that shifts away from managing for a relatively predictable future toward developing flexible and speedy responses to unpredictable, non-linear, and non-incremental change (Camillus, 1997). This represents a 20-year trend that outpaces geophysical disasters and is not expected to decrease considering that anthropogenic climate change generates population shifts to vulnerable urban areas (Pachauri *et al.*, 2014). As a result, increased population density and the extensional effects on supply chains (Webb *et al.*, 2000) create a context in which the effects of disruptive events on human life and local economies will intensify (Monllor and Altay, 2016).

Take, for example, the state of California in the USA. This state has incurred five years of historic severe drought and current data show that over 90 percent of the region is incurring

severe drought conditions, with 70 percent of the affected region incurring extreme drought conditions (Miskus, 2015). The ramifications have wreaked havoc on local agriculture yield and the economic activity. These conditions are driven in part by climate change (Spencer and Altman, 2010). Given that California is the world's ninth largest agricultural economy, it is clear the implications of this trend are more than just local or regional (Bjerga, 2014). For instance, the nation of Canada currently imports more than five billion worth of produce per annum from California and these droughts could increase the price of California-based produce by over 20 percent (Staff, 2014). Moreover, climate-based disasters are less localized than geophysical ones. The conditions in California are liable to expand to other areas of the USA, thus generating a larger potential global impact. Not only is America the world's largest food exporter, the nation maintains enormous crops of corn and soy which are used in the production of ethanol and other biofuels. The repercussions from natural disasters have potential to expand globally and influence what appear to be unrelated industries (Decapua, 2012).

#### *Organizational environments*

The frequency and severity of natural disasters create pressures and constraints for organizational environments. As such, research on organizational contexts is germane because organizations depend on exchanges with the environments in which they operate (Scott, 1998). While the literature on organizational adaptation to environmental pressures is extensive, it deals primarily with incremental adaptation to relatively continuous (as opposed to abrupt) environmental changes (Winn and Kirchgeorg, 2005). Both action and inaction by organizations to natural disasters generate entrepreneurial opportunities. Inaction leads to organizations being caught by surprise by the unprecedented scope of destruction and leaving them ill-prepared to respond effectively to the resulting damages (Linnenluecke *et al.*, 2008). The threat that economic development can stall as a result of exogenous shocks can force these firms to scale down operations, close, or move out of the region (Williams and Vorley, 2014). These exits stimulate the entry of new ventures that combine the resources released by exiting firms in new ways (Pe'er and Vertinsky, 2008). When action is taken, organizations allocate time, technology, and money to safeguard their survival and response. Both behaviors create periods of economic and market disequilibrium (Cowling *et al.*, 2015) and generate opportunities for entrepreneurs to serve as vendors or service providers. Such transactions assist existing organizations via facilitation (e.g. emergency communication networks) or the removal of inhibiting elements (e.g. damaged infrastructure) in ways that are positively consequential for both market actors (Krueger *et al.*, 2008).

For instance, organizations often carry outdated physical assets that, when damaged during a natural disaster, generate opportunities to replace those assets with better versions (Alesch *et al.*, 2001). In this way, reconstruction facilitates the establishment of more resilient institutions and can even improve a business climate (Das, 1998). Natural disasters also decrease market entry requirements because they lower the opportunity costs associated with profitable business activities (Bennett and Estrin, 2006). Indeed, history has shown that the disruption of existing traditions, policies, and structures can create a climate of innovation and entrepreneurship (Monllor and Altay, 2016). Therefore, it is reasonable to assume that destruction generates the market inefficiencies that underlie opportunity which can turn motivation into intention and action to provide new products and services (Murphy and Coombes, 2009).

Direct damage to businesses is only one among several factors that contribute to the losses communities experience in the aftermath of disasters. Damage and disruption to utility and transportation lifelines can contribute significantly to business interruption and subsequent financial losses (Linnenluecke *et al.*, 2008; Webb *et al.*, 2000).

These new challenges can trigger entrepreneurial intentions to turn inconveniences and coincidences into opportunities, putting into practice a person's professional strengths and tacit capabilities (Johannisson and Olaison, 2007). Entrepreneurs are known to see the

disruptions of major events as bases for business opportunities (Brück *et al.*, 2011; Monllor and Altay, 2016). For example, although many individuals displaced and affected by hurricanes decide not to take action, Needleman (2011) provides a few case studies of entrepreneurs who, when impacted by such a situation, recognized opportunities to act. From flood barriers and “diaper” like absorbent bags that deal with flooding to protective covers that protect from high winds and debris, these entrepreneurs rely on their own professional knowledge and experience to employ their creativity (Hansen *et al.*, 2011) and start scalable ventures that have the potential to overcome regional boundaries and are ready to act when similar disasters strike other regions (Zahra *et al.*, 2008).

Another demonstrative example is the case of *T-Cash*, a system allowing Haitians to receive payments through their mobile phones. The 2010 earthquake in Haiti killed over 200,000 people and decimated local infrastructures, including more than a third of Haiti’s banks, automated teller machines (ATMs), and money transfer stations. The decimation of these infrastructures created enormous problems for individuals, as they had to wait many hours to access their money. It also created security concerns, as people became vulnerable to thieves during the withdrawal transaction. In this case the opportunity for organizations involved utilizing mobile technology. Giving Haitians a way to transfer payments electronically, eliminated long lines at banks and ATMs and eliminated the security concerns for cash that could be stolen. Since less than 10 percent of the population even used financial institutions, *T-Cash* realized an opportunity to remain as a business after the country recovered from the disaster. Moreover, it could expand internationally to other countries or regions affected by natural disasters or those with similar developing economic environments (Zuckerman, 2011).

Although government agencies and NGOs are essential components in post-disaster recoveries, local entrepreneurs are sure to have deeper community-based knowledge to recognize problems and provide feasible solutions (Sautet, 2008). Private firms and the for-profit sector increasingly play an important role in a “whole community” approach to emergency management (McKnight and Linnenluecke, 2016). Prior knowledge is known to affect the ability to identify opportunities (Ardichvili *et al.*, 2003; Hayek, 1945; Venkataraman, 1997). Thus individuals in the affected areas have knowledge about existing markets, customer problems and how to solve them, and an understanding of local culture, which puts them in a better position to solve problems and discover opportunities created after a natural disaster (Hajizadeh and Zali, 2016; Shane, 2000).

Because the contributions of entrepreneurial ventures serve and benefit the organizations that populate a society, entrepreneurial action itself can serve as an essential part of rebuilding post-disaster societies and increase their resilience in the face of future events. The foregoing review shows that disastrous events tend to generate such entrepreneurial actions. However, as noted, the research in this area is lacking. Better understanding of the overall relationship will enable a clearer conceptualization of the personal attitude variables and intentions to serve as a roadmap for public policy that promotes appropriate entrepreneurial action. The results promise the potential for accelerated reconstruction of local communities and economic infrastructures. Moreover, such ameliorative effects of entrepreneurial action would bring greater normalcy to the lives of individuals living in a given community or society (Monllor and Altay, 2016).

## Methodology

As stated previously, the authors conducted a representative search of any and all articles published in peer-reviewed journals, including “the Big 5” (Katz, 2003) entrepreneurship journals: *Entrepreneurship and Regional Development*, *Entrepreneurship: Theory and Practice*, *Journal of Business Venturing*, *Journal of Small Business Management*, and *Small Business Economics*. First a search through electronic databases of the journals using a

broad collection of terms was conducted. The search encompassed all published articles that contained some reference to: disaster, recovery, natural disaster, opportunity, opportunity recognition, entrepreneurship, catastrophe, destruction, climate change, or any combination of these terms (e.g. disaster entrepreneurship, entrepreneurship disaster recovery, disaster opportunity recognition) in the title, abstract, or keywords. Then the search was extended to include the full text of articles and, when an electronic version was not available, articles were scanned for key terms.

The goal was to find papers that touched on the topic of creation or recognition of entrepreneurial opportunities due to the occurrence of some type of a disaster, including natural- or climate-related disasters. The mere mention of a term was not sufficient. Thus the search resulted in only three papers whose research focused on entrepreneurship, entrepreneurial opportunities, and disasters at some level and in some depth.

In the next major section, a conceptual approach to entrepreneurial intention in natural disaster contexts is developed based on the results of this search. The variables and interrelationships illustrate the impact of natural disasters on entrepreneurial intentions. The conclusion of the section presents a digested list of the approach's distinct conceptual aspects. The integrative aspects are intended to influence conceptual framing of post-disaster entrepreneurial behaviors, and especially how to elicit such behavior, as a vital part of post-disaster recovery strategies.

### Conceptual development

Entrepreneurial action often begins with a specific event or series of events that compels an individual to act. It has been postulated that such "precipitating events" are essential to the initiation of entrepreneurial actions (Shapiro, 1975, 1982). In the case of natural disasters such as earthquakes, hurricanes, and tornadoes, however, some studies regard their unpredictability as the most vital element to understanding their effects on human populations (Gaibulloev and Sandler, 2009). Thus, natural disasters affect the entrepreneur's most basic environmental context (Scott, 1998) in ways that are only *ex post* tangible, visible, and measurable (Altay and Ramirez, 2010; Monllor and Altay, 2016; Ramirez and Altay, 2008). As a result, natural disasters can severely constrain an entrepreneur's ability to act freely, while also limiting resources. Such constraints can influence certain psychological variables that explain variance in entrepreneurial intentions and behavior. In the case of environmental events and other external factors, they interact with individual characteristics to generate motivated behavior. In the more specific entrepreneurship literature, this paradigm underlies a stream of research showing that significant life events precipitate sizable increases in entrepreneurial activity (Krueger *et al.*, 2000). The power of such events stems from interruptions to the inertia that guides human behavior (Shapiro, 1982). Of course, such life events can be positive (e.g. winning the lottery) or negative (e.g. losing one's house). For example, Brück *et al.* (2011) assert that entrepreneurs assess the probabilities of being affected by natural disasters but since they are never certain of the occurrence of such events, they can derive a false sense of security from false alarms and the passage of time. Thus risk increases as entrepreneurial behavior decreases despite high individual levels of intent. Moreover, because all natural disasters are qualitatively different from one another, this context also entails uncertainty. Complex factors involving topography, population, and geography yield unexpected outcomes in natural disaster scenarios.

A small set of research has examined these complex factors and their social and economic effects as they relate to natural disasters (Winn *et al.*, 2011) and has developed a disaster impact measure that takes into account the macro-level variables (Altay and Ramirez, 2010; Monllor and Altay, 2016). This research holds that the first item to operationalize is the number of extreme events irrespective of actual damages. An enormous

category four hurricane can form and completely dissipate in the Atlantic Ocean without having any social or economic impact. By contrast, a small earthquake of magnitude 3.1 (Richter scale) and its continuous aftershocks on the American west coast can have a far larger impact on the local population and economy.

The second factor concerns the number of people affected. If the earthquake occurs in a heavily populated area, then a larger portion of people in a country are at risk. The potential damage to the availability and productivity of the workforce and the economy may be substantial. By contrast, enormous infrastructure damage in an area of low population density generates a qualitatively different kind of outcome. Therefore, the number of deaths and the number of people affected are a distinct measurable element. Finally, the third distinct factor for conceptualizing the effects of natural disasters is monetary damage, or the cost associated with the destroyed resources and property, along with the estimated total costs of repair (Linnenluecke *et al.*, 2008; Monllor and Altay, 2016).

The foregoing approach to calculating the impact and effects of natural disasters concerns macro-level factors. Building on insights from research by Ajzen (1991) and Shapero, (1982) on entrepreneurial intentions, the present study sheds light on how this level of impact of a natural disaster can also influence micro-level individual effects.

#### *Individual-level effects*

Entrepreneurial intent is an important stage that is closely linked to an individual's actions in establishing new ventures (Dimov, 2007; Thompson, 2009) with intentions causally preceding action (Krueger *et al.*, 2000; Shook *et al.*, 2003). Entrepreneurial intent is defined as "a self-acknowledged conviction by a person that they will set up a new business venture and consciously plan to do so at some point in the future" (Thompson, 2009, p. 676). This study focuses on how natural disasters impact the formation of entrepreneurial intent.

While Ajzen's (1991) and Shapero, (1982) models overlap to a large degree (Van Gelderen *et al.*, 2008), Shapero and Sokol's model of the "entrepreneurial event" is an intentions model that is well suited to the present study because it is specific to the domain of entrepreneurship and natural disasters, as noted, are external events that directly affect basic life situations. Danger zones, in particular, have a strong effect on individual intentions as they cause insecurity about starting a business (Bullough *et al.*, 2014). However, research has also shown that these types of exogenous factors are not enough to explain individual entrepreneurial activities (Krueger *et al.*, 2000). Such factors influence intentions and behavior indirectly, often through attitude changes, and formal models typically view them as moderating variables.

The present approach embraces this logic and casts natural disasters and their impact level as precipitating events that drive perceived feasibility, perceived desirability (Shapero, 1982), and perceptions of danger (Bullough *et al.*, 2014), all of which have been previously shown to directly influence entrepreneurial intentions. An examination of some elements of this approach follows.

*Opportunities.* Displacement involves a change in behavior where an actor has no other choice but to seek an opportunity for a new kind of behavior (Katz, 1992). A large proportion of entrepreneurial actions is attributable to displacement beyond those that are stimulated by natural disasters (Monllor and Altay, 2016). This is especially relevant when studying entrepreneurial behavior and natural disasters. The occurrence of natural disasters is a relatively unique situation in which the moment the precipitating factor that leads to displacement occurs an opportunity is created. Although disaster usually brings economic distress (Casson, 1982), it can also create opportunities for new venture formation. Monllor and Altay (2016) characterize the phenomenon as a form of inverted creative destruction (Schumpeter, 2013) in which the actions of the entrepreneur do not destroy the value and structures of established companies. Rather the natural event fulfills this function as the

entrepreneur takes on an opposite and ameliorative role. That role entails recognizing and developing opportunities in the aftermath (Noy and Vu, 2010) of the natural disaster.

After a disaster, affected communities are also left in a depleted state that is relevant to opportunity perceptions. These changes in the natural and communal environment can increase the likelihood of recognizing opportunities for sustainable development (Patzelt and Shepherd, 2011). Some entrepreneurs might seek community benefit and economic viability rather than high levels of return on investment. Thus disasters open the door for implementation of new organizational forms that do not have personal profit and expand the range of opportunities available to pursue (Johnstone and Lionais, 2004). Gray *et al.*'s (2014) work provides further support that dual self and collective interest improve opportunity identification in challenging contexts. While market and technological knowledge are important antecedents of opportunity recognition (Shane, 2000), they are considered insufficient to recognize opportunities to create economic, environmental, and social gain for others.

There are other factors that accompany natural disasters besides their simple occurrence which can also influence entrepreneurial opportunity recognition. The frequency of natural disasters a certain location experiences is one that needs to be taken into account when calculating a disaster's impact level and is particularly relevant to opportunity recognition (Monllor and Altay, 2016). When a community experiences a frequent number of natural disasters, local citizens acquire considerable knowledge of the problems and opportunities that arise after such events. The gained knowledge can be in the form of prior markets that have survived or failed, ways those markets have been served, and of customer problems, all of which Shane (2000) argues influence individual discovery of opportunities. The more knowledge of these problems individuals have, the more likely they will recognize an opportunity for introducing new products and services that address customers' problems and are accepted by the market. Individuals and communities located in areas frequently experiencing natural disasters would thus be expected to be more apt to recognize opportunities as they are more knowledgeable of the problems the disasters create, the market the disasters impact, and how to deal with issues that arise when trying to serve these markets.

Research on this topic is limited, but what studies do exist show that entrepreneurial perceptions are higher after extreme events than they are before such events. Moreover, entrepreneurs recognize opportunities in more ways than one, including not only new kinds of action, but also the removal of new barriers so that old actions can continue (Brück *et al.*, 2011).

*Feasibility.* In Shapero's (1982) model of the entrepreneurial event, feasibility is conceptually associated with perceived self-efficacy, or perceived self-control in Ajzen (1991) theory of planned behavior. The model assesses the beliefs that an individual is competent in a given situation, can perform a given behavior, and reflects the perceived feasibility of performing that behavior. Even more pertinent, feasibility perceptions drive career-related choices, including entrepreneurship, which is why it is not surprising that it has been widely studied and linked to many entrepreneurial phenomena (Krueger *et al.*, 2000).

Ajzen *et al.* (2009) hold that when individuals formulate a plan laying out their steps to carry out an intended action, connections between intended and actual behaviors increase dramatically – even when tasked with disagreeable goals. Thus higher levels of self-efficacy make one feel more competent to overcome obstacles, set higher goals, and persist in the activities required to achieve those goals (Erikson, 2002) and this process is robust even in instances of high uncertainty (Trevelyan, 2009). The literature on self-efficacy is enormous and shows that this individual-level construct derives from hands-on experiences, emotional stimulation, and physiological states (Ajzen, 1987; Boyd and Vozikis, 1994; Krueger and Brazeal, 1994; Shapero, 1975, 1982).

Self-efficacy underlies individual intentions for entrepreneurship and influences the perceptions of feasibility (Shapero, 1975, 1982). More recently, the construct has been described as relevant to environmental obstacles and feasibility (Krueger *et al.*, 2008). Indeed, surmounting barriers are required for turning intentions into actions (Ducharme and Brawley, 1995). If the barriers generated by a natural disaster create an environment of seemingly insurmountable obstacles, it is logical to assume that self-efficacy becomes important to entrepreneurial action. Entrepreneurs in disaster settings may face migration of communities, declines in buyer demand, decreased availability of resources, higher transaction costs, and supply chains interruptions (Webb *et al.*, 2000). Such conditions can hinder entrepreneurial activity, especially for individuals with low levels of self-efficacy.

*Desirability.* Behavior should be perceived as not only feasible, but also desirable (Krueger *et al.*, 2000). According to Ajzen (1991), three antecedents shape all individual intentions to act: personal attraction, subjective norms, and perceived behavioral control. It is the first two antecedents in particular that underlie the perceived desirability of the intended actions (Kautonen *et al.*, 2013, 2015). Desirability is defined as the attractiveness of starting a business to the individual intending to start the business (Shapero, 1982). Individuals have expectations and beliefs about how much they can actually affect the results of their behaviors. Stronger beliefs that they can control those results lead to more desirable perceptions of action. Natural disasters are exogenous and uncontrollable and, in most cases, unpredictable. Given that entrepreneurs face uncertainty, risks, obstacles, and vulnerabilities, the situation can seem to be outside of the entrepreneur's control. Of course that perception affects their belief about the amount of influence that their actions will have on final outcomes. Such a non-desirable option lowers an entrepreneur's willingness to act, even if they originally had strong intentions.

In addition to perceived behavioral control, which is an intrapersonal impact, extrapersonal factors are also considered in the perceived desirability of acting on an opportunity. Through their actions, firms enjoy an increase in community goodwill and reputation as their response to natural disasters strengthens community resilience (Mcknight and Linnenluecke, 2016). This is accomplished by improving social capital, community competence, and/or economic capital. Disaster opportunities can be perceived as more desirable since community shareholders share in the losses (Garriga and Melé, 2004) and mitigate risks (Johnstone and Lionais, 2004) associated with the encompassing disruptions.

*Fear of failure.* Natural disasters create environments in which entrepreneurs perceive fear and danger. Any theory of entrepreneurial action in such contexts should clarify how entrepreneurial activities shift away from survival and protection and toward opportunity identification. Without the affordance to pursue an opportunity in a motivated way, one is liable to resort to other methods perceived to be less risky or dangerous (Bullough *et al.*, 2014). Fear of failure is a measure of attitude toward risk and is closely related to one's decision to become an entrepreneur (Kihlstrom and Laffont, 1979). When one is strongly averse to failure, their psychologically based attitude reduces the importance of perceived opportunities (Welpé *et al.*, 2012) and creates a barrier to one's entrepreneurial intentions (Ardagna and Lusardi, 2008; Wagner, 2007) even if very clear opportunities are present.

Natural disasters usually affect communities through distinct considerations of size, frequency, and duration of the event(s). California's persistent drought conveys the importance of the duration of a natural disaster. The Caribbean and the Pacific, by contrast, which are hit by large hurricanes multiple times a year, convey the importance of the frequency of the events. Event frequency generates different kinds of perceptions and the relevant question is when or even where "the next one" is going to occur. Indeed, fear of failure becomes relevant in several different ways. For instance, the passage of time, as well as false alarms, can generate false senses of security and the accompanying perception that there is no good reason to expect anything but successful action. As a result, intentions are more liable to develop into entrepreneurial actions.

*Resilience.* It should come as no surprise that fear is one among many negative emotions such as anger, anxiety, and sadness that are generated when a natural disaster occurs. What might seem surprising is that positive emotions, such as gratitude, interest, and love, have been found to coexist with these negative emotions (Folkman and Moskowitz, 2000; Tedeschi and Calhoun, 2004). These positive emotions help shield resilient individuals and actually allow some to thrive (Fredrickson *et al.*, 2003). Resilient individuals, individuals considered able to continue living a purposeful life after hardship or adversity (Tedeschi and Calhoun, 2004), are drawn to activities that alleviate problems particularly relevant to post-disaster environment. For example, tackling the lack of employment and financial instability are activities that not only help the individual bounce back but also bring a semblance of normality that might be missing in a post-disaster environment (Carver *et al.*, 1989; O'Brien and Delongis, 1996).

In what follows, six propositions are developed from these conceptual aspects that are useful for research on entrepreneurial behavior in natural disaster contexts. These six propositions can lead to the development of research questions about the linkages between natural disasters and entrepreneurial intentions.

### Research framework

The circumstances encountered by individuals after a natural disaster are an exceptional set of circumstances. The specific nature of these circumstances influences individual attitude variables in ways that uniquely transform entrepreneurial intentions into behaviors. The ensuing six propositions consider how natural disasters impact variables that influence decreasing or increasing entrepreneurial intentions, either directly or indirectly. Specifically, they contemplate the relationship and influence that specific types of opportunities (opportunity vs necessity), uncertainty, fear of failure, and resilience have on entrepreneurial intentions.

Natural disasters disrupt and, in some instances, eliminate established businesses, supply chains, and whole industries (Monllor and Altay, 2016; Pe'er and Vertinsky, 2008). Therefore, the individuals rooted in environments affected by disasters experience these disruptions firsthand and are often forced to act or displaced entirely. Personal threat is a motivation for "necessity entrepreneurship," which Patzelt and Shepherd (2011) suggest may trigger recognition of sustainable development opportunities that counteract these threats.

Our approach builds on these notions and examines how the same entrepreneurs are disposed to act. In other words, our contribution acknowledges the reality that exists when members of a community have basic but unmet needs which must be addressed for survival and a return to a sense of normalcy. Therefore, as noted earlier, the antecedent of the action and the need for action occur in the same moment: individuals take action without prior intention, but with predisposition. These actions are manifest as entrepreneurial:

- P1.* Natural disasters increase entrepreneurial intentions when they generate necessity-driven opportunities.

Entrepreneurial action can also align with government and NGO activities (e.g. rebuilding, resettling) in natural disaster settings. However, rather than having grand macro-level plans, local entrepreneurs most often cater to a constituency defined by the shared needs of a community (Murphy and Coombes, 2009; Peredo and Chrisman, 2006). Since these communities were likely affected by the natural disaster in question, it takes more time to harness and leverage the resources for entrepreneurial action (Sautet, 2008) and the types of ventures generated initially might not lead to high-growth ventures. However, as noted earlier, they are uniquely capable of assisting the businesses affected by the disaster in their efforts of reestablishment and survival. Success in these instances is grounded in the reconstruction of damaged infrastructure and the rehabilitation of larger capital assets

(Galbraith and Stiles, 2006; Johannisson and Olaison, 2007). Businesses that inhabited the pre-disaster environment face novel and daunting challenges after a natural disaster, such as utterly redefining who their customers are and how to serve the market in an entirely new way. The entrepreneurial intentions that assist such efforts stem from opportunities rooted in the necessity of reconstruction, not from any pre-existing opportunity:

*P2.* Opportunities stemming from natural disasters will be perceived as more feasible when they are ameliorative to affected elements of the pre-disaster context.

Although reconstruction and recovery opportunities are the most predominant after a natural disaster, they are not necessarily pursuant to a longer recovery strategy of a post-disaster context as they are probably not the ones making a significant contribution to a country's innovation, employment creation, and economic growth (Hessels *et al.*, 2008). Eventually, they must evolve into opportunities that will generate future growth and development (Galbraith and Stiles, 2006). Entrepreneurial ventures that ultimately grow to scale are usually "pulled" by market opportunities, not "pushed" by internal development (Acs and Varga, 2005). This means that for entrepreneurship in post-natural disaster settings the necessity of helping the community wanes over time and it is ultimately replaced by the prospect of more traditional types of value generation (Sautet, 2008). Therefore, successful natural disaster entrepreneurship tends to be an especially adaptable activity. The behavior of necessity-driven entrepreneurship is different from that of opportunity-driven entrepreneurs (Monllor and Altay, 2016). Initially the intensity of the latter type of entrepreneurship lags behind the former but ultimately surpasses it. Opportunity-driven entrepreneurship is a result of choice, the desire for independence, or increased wealth. By contrast, necessity-driven entrepreneurship derives from displacement: one is forced into it because there are no other options (Williams, 2008):

*P3.* Opportunities stemming from natural disasters will be perceived as more desirable when they have potential for future growth and development, thus increasing entrepreneurial intentions.

When considering whether an individual will act entrepreneurially, you must consider beliefs about uncertainty. Disasters can cause regime uncertainty, which has the potential to be extremely detrimental to entrepreneurial action. If local government keeps constantly changing the rules and is unclear, it is nearly impossible for entrepreneurs to act and they are forced to devote their time "playing the game" (Chamlee-Wright and Storr, 2009). The availability of credit, or lack of, is also of extreme importance in economic recovery situations. In most cases, ample credit is unavailable to post-disaster entrepreneurs even with the advent of microfinance and widespread networks of donors (Galbraith and Stiles, 2006). These tendencies can have a devastating effect on entrepreneurial intentions and cause a decline in apparently viable opportunities (Sanz-Velasco, 2006). In particular, immediately after an extreme event, the costs of business tend to rise through increased wages, higher insurance premiums, and greater security expenditures which in turn reduce profits (Gaibullov and Sandler, 2009). These factors combine to create uncertainty and doubt for entrepreneurs because alternative courses of action for conducting business are generally unknown. This reduces entrepreneurial intentions and actions by undermining beliefs regarding whether the environmental stimulus presents an opportunity and if this opportunity could feasibly be enacted (McMullen and Shepherd, 2006):

*P4.* Natural disasters create highly uncertain environments that increase fear of failure and decrease entrepreneurial intentions.

Research on entrepreneurial intentions in danger zones shows that some individuals are willing to risk assets or even their lives in pursuit of entrepreneurial opportunities (Bullough *et al.*, 2014;

Cusack and Malmstrom, 2011). At the same time, research shows no difference in the general fear of failure pre- and post-natural disaster even though entrepreneurial behaviors increase post-natural disaster (Monllor and Altay, 2016). This is the case potentially because individuals who are affected by natural disasters are usually not afraid to act since they have relatively little left to lose. Taking entrepreneurial action, then, is often the only option one has to meet personal needs of survival and take steps toward recovery and rebuilding of communities. This consideration involves the difference between opportunity-driven and necessity-driven entrepreneurship in the *P3* and combines it with the fear of failure construct from the *P4*. In other words, the entrepreneurs in question act to create a safer environment with respect to basic considerations not to generate disposable levels of value or luxuries:

*P5.* Fear of failure hinders entrepreneurial intentions more so in cases of opportunity-driven entrepreneurship than it does in necessity-driven entrepreneurship.

Resilience is particularly relevant under adverse conditions and post-disaster environments (Bullough *et al.*, 2014) and plays an integral role in entrepreneurship research (Baron and Markman, 2000; Markman *et al.*, 2005). Resilience allows individuals to push on in difficult times when others might be discouraged to confront challenges and roadblocks that pop up in their attempts to start a new venture. For example, among entrepreneurs who have failed in their efforts to start a business, those who are more resilient are more likely to try again when a new opportunity appears (Hayward *et al.*, 2010). Even more pertinent is the fact that more resilient individuals are less affected by perceived danger. Resilient entrepreneurs can better cope with dangerous environments and take action in the face of adversity. Resilience attenuates the impact of perceived danger, thus increasing entrepreneurial intentions (Bullough *et al.*, 2014):

*P6.* Resilience moderates the link between fear of failure and entrepreneurial intentions, serving as a shield that protects intentions from the negative impact of fear of failure.

These six propositions, digested in Table I, help inform entrepreneurship research with the aim of stimulating new questions about how natural disaster settings serve as catalysts for entrepreneurial intention. Research in this domain promises to shed new light on how such intentions can best be supported and promoted by state, public policy, or entrepreneurial networks.

Proposition	References
1. Natural disasters increase entrepreneurial intention because they generate necessity-driven opportunities	Monllor and Altay (2016), Patzelt and Shepherd (2011), Pe'er and Vertinsky (2008)
2. Opportunities stemming from natural disasters will be perceived as more feasible when they are ameliorative to affected elements of the pre-disaster context	Galbraith and Stiles (2006), Johannisson and Olaison (2007), Murphy and Coombes (2009), Peredo and Chrisman (2006), Sautet (2008)
3. Opportunities stemming from natural disasters will be perceived as more desirable when they have potential for future growth and development	Acs and Varga (2005), Galbraith and Stiles (2006), Hessels <i>et al.</i> (2008), Monllor and Altay (2016), Williams (2008)
4. Natural disasters create highly uncertain environments that increase fear of failure and decrease entrepreneurial intentions	Chamlee-Wright and Storr (2009), Gaibulloev and Sandler (2009), Galbraith and Stiles (2006), McMullen and Shepherd (2006)
5. Fear of failure hinders entrepreneurial intentions more so in cases of opportunity-driven entrepreneurship than it does in necessity-driven entrepreneurship	Bullough <i>et al.</i> (2014), Cusack and Malmstrom (2011), Monllor and Altay (2016)
6. Resiliency moderates the link between fear of failure and entrepreneurial intentions, serving as a shield that protects intentions for from the negative impact of fear of failure	Baron and Markman (2000), Bullough <i>et al.</i> (2014), Hayward <i>et al.</i> (2010), Markman <i>et al.</i> (2005)

**Table I.**  
Propositions: effects of natural disasters on entrepreneurial intentions

## Discussion

Natural disasters are destructive events that generate social distress and economic tensions. Thanks to globalization of markets and supply networks, the effects of these disasters go beyond national and other boundaries. A natural disaster in one part of the world can cause significant market disruptions in another and their occurrence and impact is not expected to decrease. As such, the importance of entrepreneurial initiatives for rebuilding natural disaster zones is unmistakable. Moreover, the prevalence of such actions occurring in the wake of natural disasters is a historic fact.

Yet little is known about the factors that underpin individual entrepreneurial decisions and actions in these environments. This study helps flush out some of those factors and highlights their unique characteristics by exploring the nature of different types of opportunities. It also reviews the roles of self-efficacy, feasibility, desirability, fear of failure, and resilience and puts those factors into the context of natural disasters. It builds on prior work on the antecedents of entrepreneurial intentions in peaceful and stable environments to shed light on how those factors apply to other kinds of environments. Finally, this study formulates a conceptual approach and six propositions that engage the principal research question.

Our propositions provide some interesting arguments on how individual-level factors may influence entrepreneurial intentions in ways that are unique to post-disaster environments. Consider *P1*, which holds that entrepreneurial action increases due to an increase in the creation of necessity-driven opportunities. Natural disasters are significant life events (Krueger *et al.*, 2000) that interrupt the inertia that guides human behavior (Shapiro, 1982). An individual who might possess zero or extremely low levels of entrepreneurial intentions ends up “pushed” into action by needs forced upon him by the new circumstances. The needs for security, survival, and well-being lead to action and override prior lack of entrepreneurial intentions. This highlights the importance of considering the opportunities created after a natural disaster (Monllor and Altay, 2016) as these have the potential to make us rethink current theories of entrepreneurial intentions and behavior (Krueger, 1993; Krueger and Dickson, 1994; Krueger *et al.*, 2000).

A similar argument can be made with fear of failure. Past research has found that having an idea for setting up a business has motivating properties (Van Gelderen *et al.*, 2008), but this would only apply to ideas that are necessity driven. *P4* and *P5* state that when fear of failure increases, entrepreneurial intentions and action decrease, but this effect only materializes when the opportunities created by the disasters are opportunity driven. Out of the variables making up the attitude toward entrepreneurial intentions, a preference for financial security is a consistent predictor across samples and dependent variables (Van Gelderen *et al.*, 2008). The realities of a post-disaster setting are characterized by potential decreased access to credit, increased labor costs, and incessantly changing regulations (Chamlee-Wright and Storr, 2009; Gaibullov and Sandler, 2009; Galbraith and Stiles, 2006). These circumstances invariably lead to increased fear of failure on the part of entrepreneurs. Yet while fear of failure is traditionally considered a hindrance to entrepreneurial action, this would not apply in the case of necessity-driven opportunities. Necessities of the individual and his community override increases in fear of failure, at least temporarily until the situation returns to a pre-disaster state and the entrepreneur feels free to take opportunity-driven action. *P6* further decreases the impact of fear of failure on intentions by bringing resilience into the mix. Resilience allows those suffering the negative impact of disasters to experience positive emotions. It pushes some of them to thrive in conditions where one would expect them to be discouraged or simply give up. Resilience negates increases in fear of failure or might possibly prevent fear of failure from increasing at all.

*P2* and *P3* address the potential impact and interactions of perceived feasibility and desirability. In stable environments where these factors are traditionally studied, both have

a cumulative effect of turning entrepreneurial intentions into action (Krueger, 1993; Krueger *et al.*, 2000). The same might not be true in the uncertain and distinctive environment created by the occurrence of a natural disaster. As illustrated by Webb *et al.* (2000), particular kinds of businesses, such as construction, experience gains after a disaster. Those ventures that address the latest needs of the community and local businesses will become more feasible, driving increases in entrepreneurial action irrespective of whether this is a type of business the individual desires to start. Other types of ventures with higher potential for growth and scalability, and thus possibly valued as more desirable, will be placed on the back burner until the situation is returned to, or close to, a pre-disaster state. When this happens, desirability will come back into play and take a more prominent role together with feasibility in turning entrepreneurial intentions into action. Thus our proposition adds a layer of complexity to current models of entrepreneurial intentions in that it proposes that feasibility and desirability do not always have a cumulative effect as in the case of a post-disaster environment.

### Conclusion

This paper is intended to raise understanding of how natural disasters lead to entrepreneurial action and intentions in a formal and conceptual way. Intentions are a mediating variable that intervene between intentions and action (Ajzen, 1991; Wilson *et al.*, 2007), but the advent of a natural disaster and the behavior of starting a business venture certainly need more empirical research to provide a more unifying theory on entrepreneurship in adverse conditions (Bullough *et al.*, 2014). Future studies that apply longitudinal methodologies to examine who starts a business and who succeeds after the occurrence of a natural disaster is warranted.

It is a good time in the entrepreneurship field to investigate the relations implicated by our new approach. For instance, our approach takes into consideration the level of impact of a natural disaster (i.e. number of events, people affected, monetary damages) irrespective of event frequency. Entrepreneurs make sense out of the environments and perceive opportunities differently: exposure to frequent events influences local knowledge (Shane, 2000). Integrating event magnitude and frequency into one formal approach is a rich avenue of exploration and is well suited for empirical studies following the conceptual elements of our approach.

Natural disasters also influence variables that pull entrepreneurial intentions in opposing directions. *P1* states that natural disasters increase entrepreneurial intentions as they generate necessity-driven opportunities. At the same time, *P4* posits that natural disasters decrease entrepreneurial intentions due to the uncertain environments they create, which increase fear of failure. Whether the creation of necessity-driven opportunities has a stronger influence than fear of failure in entrepreneurial intentions, or vice versa, is another potential area for future study. Add to that the effect that resilience has on intentions, scholars now have several potential streams of research to choose from to start disentangling these relationships. For example, does resilience serve to shield potential post-disaster entrepreneurs from the effects of increased fear of failure or does it prevent fear of failure from increasing at all? Finally, while not addressed in this study, pre-disaster economic factors have the potential to impact post-disaster entrepreneurial intentions. GDP per capita has been shown to be negatively associated with necessity-motivated entrepreneurship (Hessels *et al.*, 2008; McMullen *et al.*, 2008). The present conceptual approach argues that necessity-driven opportunities are a positive driver of intentions as they would be considered more feasible by potential entrepreneurs. Communities with a stronger or more developed economic base might negate this relationship as they have the resources to recover to a pre-disaster state. Entrepreneurs would instead turn their attention to opportunity-driven ideas with high-growth potential.

Natural disasters create difficult situations and as such they also create opportunities for individuals to create value, which in turn can lead to accelerated recovery and reconstruction. A clearer understanding of which variables matter to these intentions and actions can surely serve an important role in future education and policy making intended to address the reality of natural disasters. One policy making implication concerns the impact of local support for entrepreneurship. Does it matter if the local community has pre-disaster support of local government programs or NGOs? Such research can shed light on the types of government policies that would benefit increasing entrepreneurial action, especially with regard to disaster relief contexts which are always in the purview of the state. When it comes to entrepreneurs, such research would engage important questions concerning the perceptions of opportunity and fear of failure by individual entrepreneurs. While a natural disaster is likely to induce governmental intervention, such intervention might inadvertently discourage new business creation through asymmetric regulations or policies. After all, such intervention is also a kind of exogenous variable and thus likely to yield merely indirect influences on recovery action. For example, when an individual's focus is on surviving and avoiding immediate threats, their pursuit of potential long-term business enterprises can be jeopardized (Bullough *et al.*, 2014). Furthermore, as argued in this paper, entrepreneurs seek to focus on necessity-driven opportunities that will ameliorate the impact of the event and return to a pre-disaster context. It would be wise for local governments, NGOs, and local organizations working to promote entrepreneurship to focus their efforts on creating an environment that is perceived as safe by potential entrepreneurs. The requirements of this environment and the actions necessary to develop it is another area of focus for future studies. Overall, future studies should help determine how and when it is best to intervene and what type of intervention works best to drive recovery after a natural disaster.

Studies have shown that self-efficacy can be developed (Coutu, 2002; Wilson *et al.*, 2007) and people are likely to acquire entrepreneurial intentions when self-efficacy is high. Bandura (1992) suggests that self-confidence in our abilities to successfully perform specific tasks comes from four key sources: mastery experiences, modeling, social persuasion, and "learning by doing" (Cox *et al.*, 2002). Providing opportunities in class to conduct feasibility studies, develop business plans, and participate in running simulated or real businesses can therefore potentially play an important role in developing entrepreneurial self-efficacy. For areas impacted by frequent natural disasters, educators should thus work to foster entrepreneurship through activities that model the work of others (Bandura, 1986), who have been successful starting businesses out of turbulent times (Bullough *et al.*, 2014). They should also provide access to mentoring and speaking events by those who have experienced and worked in adverse situations (McMillen, 1999).

Resilience materializes as a result of unique and unexpected dynamics (Masten, 2001; Vogus and Sutcliffe, 2007). It can be learned over time and with experience out of relatively ordinary processes. Individuals and communities frequently impacted by natural disasters, such as hurricanes in the Caribbean or earthquakes in the Pacific, can thus be expected to be resilient in the face of traumatic and stressful events and to persevere when compared to individuals less accustomed to dangerous or adverse living and working conditions. As with entrepreneurial self-efficacy, resilience is an attribute that can be developed (Coutu, 2002). Local government and NGOs working in environments where disasters are frequent and likely to strike should consider implementing training programs that include activities, practice, and feedback from resilient entrepreneurs. These entrepreneurs can also serve as speakers, role models, and mentors to students in whom they wish to promote resilience and who have potential to act in case of future disasters.

This research work is an important first step that promises to serve as a useful foundation for future research. While macro-level research on business development after natural disasters does exist, our approach complements that research with a micro-level

view. The aim is not only to stimulate research projects that increase what is known about entrepreneurial intention and behavior, but to guide future policy. The ultimate expectation is the creation of new means of achieving more effective action that serves people and areas affected by natural disasters and minimizes disaffection and destruction.

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