

Businesses perform an essential role in community functioning (Tierney, 2006; Zhang, Lindell, & Prater, 2009), delivering “a vast array of goods and services that literally make life possible in our complex global economy” (Tierney, 2006, p. 275). When a disaster causes damage to a significant number of businesses, or otherwise disrupts their business operations, the local economy becomes in danger of unraveling (Alesch, Arendt, & Holly, 2009; Phillips, 2009; Tierney, 2006). The failure of all or parts of a local economy can lead to a variety of potentially negative consequences, including job loss, population displacement, and lost tax revenue; which, in turn, can adversely impact the abilities of individuals and households, as well as communities, to recover from a hazard event (Phillips, 2009; Tierney, 2006; Tierney, Nigg, & Dahlhamer, 1996). With so much at stake, local government officials tend to place a premium on economic recovery (Alesch et al., 2009; Phillips, 2009), “even making it a priority above other recovery concerns” (Phillips, 2009, p. 232). A critical component of achieving overall economic recovery at the community level is determining the ability of businesses within that community to successfully negotiate the recovery process (Tierney, 2006). The purpose of this essay is to use the academic literature as a basis for identifying those factors which community leaders could use at the moment of a disaster to predict how recovery will proceed for the businesses within their jurisdiction, as well as those factors which would be meaningful to assess in order to gauge businesses’ progress as the recovery process evolves. The establishment of such assessment factors could further the discipline of emergency management by serving as the basis for a theoretical model of community business recovery. Distinguishing these factors would also assist the profession and distributed function (Canton, 2007) of emergency management by providing valuable information to emergency managers, local leadership, and others involved in community recovery that could guide their efforts to facilitate business recovery and prevent or minimize the breakdown of the local economy (Alesch et al., 2009; Zhang et al., 2009).

Despite the importance of businesses to the local economy, business recovery has only recently emerged as an area of interest in disaster recovery research (Tierney, 2006; Tierney et al., 1996; Zhang et al., 2009). Work in this area has been spurred by the Disaster Research Center (DRC) at the University of Delaware, which conducted a series of survey studies during the 1990s on both short-term and long-term business recovery

across four disasters—the Loma Prieta earthquake in 1989, Hurricane Andrew in 1992, the Midwest floods in 1993, and the Northridge earthquake in 1994—that investigated recovery outcomes at the individual firm level (see for example: Dahlhamer & Tierney, 1996, 1998; Tierney, 1997; Webb, Tierney, & Dahlhamer, 2000; 2002). Hurricane Katrina also has prompted additional research on business recovery (see for example: Chamlee-Wright & Storr, 2008; Pearson, Hickman, & Lawrence, 2011; Runyan, 2006). And, several studies have examined the impact of disasters on small businesses across a number of different hazard events (see for example: Alesch & Holly, 1997; Alesch, Holly, Mittler, & Nagy, 2001; Alesch, Taylor, Ghanty, & Nagy, 1993; Daynes, Lee, Amapapurkar, Stafford, Haynes, & Brewton, 2009; Durkin, 1984; Haynes, Daynes, & Stafford, 2011; Kroll, Landis, Shen, & Stryker, 1991; Runyan, 2006). Although much scholarly work remains to be done in the area of business recovery (Tierney, 2006; Zhang et al., 2009), efforts to date make it “possible to provide at least provisional answers to questions related to recovery processes and outcomes” (Tierney, 2006, p. 284). This essay will rely on the empirical findings noted above, as well the results of other applicable empirical studies, to suggest those factors for prediction and assessment of business recovery that could assist community officials in managing the economic impacts of a disaster. However, given the provisional nature of this body of knowledge, it is important to note that these prediction and assessment factors may not be absolute. Rather, the identification of these factors serves as a starting point to create a model from which to test measures of business recovery across a diverse range of recovery scenarios to verify the appropriateness and adequacy of suggested factors. It is also important to note that the scope of this essay does not allow for the operationalization of the factors that influence business recovery outcomes, meaning that specific measures for the factors introduced in the below sections and the means with which these measures would be assessed are not addressed.

Predicting Business Recovery

The literature has identified a variety of factors that have been linked to the level of success achieved by businesses during the recovery period. In reviewing these factors, many could be leveraged by local officials upon disaster impact to predict how businesses in their community might be expected to recover. This section

describes these factors and specifies how these factors could be used by local officials to forecast the potential recovery success of businesses in an impacted community. This section concludes with a brief discussion on research gaps associated with the identified predictive factors and the importance of bridging those gaps in order to strengthen the potential for further development of a model predicting community business recovery.

The literature suggests that certain business characteristics can affect the ability of businesses to recover after a disaster. Research has consistently indicated that larger businesses are more likely to achieve more positive recovery outcomes than smaller businesses (Alesch et al., 2001; Alesch et al., 1993; Chang & Falit-Baiamonte, 2002; Dalhamer & Tierney, 1996; Haynes et al., 2011; Kroll, Landis, Shen, & Stryker, 1991; Runyan, 2006; Wasileski, Rodriguez, & Diaz, 2011). Businesses that serve a regional or international market also tend to recover more quickly than those that only serve local markets (Chang & Falit-Baiamonte, 2002; Webb et al., 2002), with businesses that rely on the discretionary income of local residents being particularly vulnerable to negative recovery outcomes (Alesch et al., 2001; Pearson et al., 2011; Tierney, 2006; Zhang et al., 2009). Businesses that have multiple locations or are part of a franchise or chain likewise tend to recover more quickly than businesses that are singular entities (Dalhamer & Tierney, 1996; Runyan, 2006).

Another business characteristic which appears to make a difference in recovery outcomes has to do with the type of sector in which a business operates. Wholesale and retail businesses generally experience considerable losses in sales following a disaster (Boarnet, 1998; Chang & Falit-Baiamonte, 2002; Dalhamer, 1998; Dalhamer & Tierney, 1996, 1998; Durkin, 1984; Kroll et al., 1990; Slack, Myers, Singelman, & Doucet, 2010; Wasileski et al., 2011; Webb et al., 2000, 2002), while manufacturing and construction companies often demonstrate significant gains following a hazard event (Chang & Falit-Baiamonte, 2002; Corey & Deitch, 2011; Dalhamer, 1998; Dalhamer & Tierney, 1996, 1998; Durkin, 1984; Kroll et al., 1990; Slack et al., 2010; Webb et al., 2000, 2002). Businesses that own their business property also tend to recover better than those that lease their business space (Alesch et al., 2001; Durkin, 1984; Runyan, 2006; Wasileski et al., 2011). In addition, businesses which are newer (Haynes et al., 2011; Dalhamer & Tierney, 1996; Webb et al., 2002) or are in a worse financial condition prior to a disaster appear to have increased chances of positive recovery outcome

(Dalhamer & Tierney, 1996; Webb et al., 2002). Although these last two factors may be seemingly counterintuitive, researchers suggest that more established firms and those in better financial conditions pre-disaster may have more to lose (Webb et al., 2002) or may be subject to what Webb et al. (2002) deem “organizational inertia” (p. 54), meaning that these businesses may not be able to easily adapt to the changing post-disaster environment than those that are new or struggling in the pre-disaster environment.

Based on the business characteristics identified in the two preceding paragraphs as being influential to business recovery, there are a number of factors that local government could review both prior to, or in the immediate aftermath of a disaster to predict business recovery for their community. Local officials could classify and count the numbers of large and small businesses within their community to determine the percentage of each that each makes up within the local economy. Community leadership could also distinguish how many and what proportion of businesses in the community serve the local population versus the businesses who serve regional or national markets, as well as the number and percentage of businesses within the local economy who are a part of a chain/franchise or who have multiple locations. The ratio of businesses who rent their business property versus those who own their business property could also be established to help predict business recovery. Understanding what percentage of the local economy is made up of wholesale or retail businesses, as well as what portion of the local economy consists of construction or manufacturing businesses would also be important for local officials in forecasting recovery. Community leadership could also determine the number and percentage of new and struggling businesses within the local economy to predict recovery outcomes. In those instances where a large percentage of the businesses within the community display those business characteristics that have a greater propensity to yield negative recovery outcomes, local officials can anticipate increased challenges associated with economic recovery (Tierney, 2006).

In addition to business characteristics, the literature also suggests certain disaster impacts that can influence the ability of businesses to recover. The literature indicates that businesses with less physical damage to property, including nonstructural elements and business contents/inventories, are more likely to recover more quickly than businesses who suffer more extensive damage (Chang & Falit-Baiamonte, 2002; Dalhamer &

Tierney, 1996; Kroll et al., 1991; Green, Miles, Gulacsik, & Levy, 2008; Wasileski et al., 2011; Webb et al., 2002). The literature also suggests that less disruption to infrastructure and utilities, such as electricity, sewer, water, fuel, telecommunications, and transportation, translates to more positive business recovery outcomes than when more damage to these lifeline systems is present (Alesch et al., 1993; Green et al., 2008; Gordon, Richardson, & Davis, 1997; Kroll et al., 1991; Tierney, 1997; Tierney & Nigg, 1995; Tierney et al., 1996; Webb et al., 2000, 2002). Businesses are particularly sensitive to the loss of electrical power, as many of the other infrastructural elements rely on electricity to function (Tierney & Dalhamer, 1997). An absence or shortened duration of business closure has also been linked to increased probabilities of recovery (Alesch et al., 2001; Nigg & Tierney, 1990; Webb et al., 2002), as has a reduced amount of disaster-induced operational problems such as supply-chain difficulties, decline in customer demand, and the inability of employees to get to work (Corey & Deitch, 2011; Dalhamer, 1998; Dahlhamer & Tierney, 1998; Durkin, 1984; Kroll et al., 1991; Tierney, 1997; Wasileski et al., 2011; Webb et al., 2002).

Based on the disaster impacts identified in the above paragraph as being influential to business recovery, there are additional factors that local government could rely on to predict how business recovery might proceed in the community. Government officials could evaluate the number and percentage of businesses within the community who have received physical damage to their property, as well as evaluate the extent of this damage. Community leadership could determine the extent of damage to the various infrastructure and utility lifelines, how many and what proportion of area businesses are without these different lifeline services, and the projected duration of outage for utilities and closure for roads. Understanding infrastructure damage would also allow government officials to ascertain the level of difficulty businesses might have in getting supplies, customers, and employees to their business locations. In addition, examining the number of deaths and injuries associated with the disaster, as well as the amount and extent of damages to homes and other residential areas, would assist local leadership in providing initial insight into the challenges that business may face with operational disruptions caused by customer and/or employee loss. The number and percentage of businesses closed in the immediate impact aftermath of the disaster and a baseline projection for the length of closure could also be

quickly established to help predict business recovery. In those instances where a significant percentage of businesses within the community are closed or operating at a reduced capacity due to direct physical damage, utility and infrastructure disruption, operational problems, or some combination thereof, community leadership can expect to be faced with greater challenges in the recovery of the local economy (Alesch et al., 2009; Phillips, 2009).

It is worth noting that certain factors that may be expected to influence business recovery actually make no difference in business recovery outcomes and are therefore not being offered as means to predict community business recovery. For example, while it would make sense that those businesses who engage in preparedness activities prior to a disaster such as storing emergency supplies, purchasing insurance, or making business relocation plans would recover better after an event, research has not shown preparedness levels to influence recovery outcomes (see for example: Chang & Failit-Baiamonte, 2003; Corey & Deitch, 2011; Tierney & Dahlhamer, 1997; Webb et al., 2000, 2002). Those businesses who have undertaken loss containment measures such as moving contents to safer locations or taking steps to secure property have likewise not been shown to recover better than those who did not take such measures (Webb et al., 2000, 2002). Previous disaster experience, which might be expected to aid businesses in recovery by preparing them for what to expect during the recovery timeframe, has also not been linked to more positive recovery outcomes (Runyan, 2006; Webb et al., 2000, 2002). And the receipt of post-disaster aid, which might be expected to assist businesses in regaining assets lost in a disaster, has not proven to yield more positive recovery outcomes (Webb et al., 2000, 2002). In fact, in a few cases, particularly in small, family-owned businesses, the receipt of post-disaster aid has been linked to more negative recovery outcomes, although this research has not been conclusive (see for example: Alesch et al., 2001; Brewton et al., 2010; Dalhamer & Tierney, 1996, 1998). Further research is needed on the factors discussed in this paragraph to verify their influence, or lack thereof, on business recovery and ascertain the reasons why the factors, although seemingly important, are not having any impact.

Although the various factors that could be used to predict business recovery have been discussed in isolation, it is clear that businesses could potentially be affected by more than one factor alone. And, this

combination of factors could possibly shape the ability of businesses to recover. For example, at an individual level, a business could be small, lease its business property, and suffer some direct damage to its business property, but at the same time, the business could also be in the construction sector, have minimal impacts to its operations, and a short duration of closure. How would one predict its recovery when looking across these different factors? Much of the research to date has concentrated on parceling out the individual factors that do and do not influence business recovery (see for example: Alesch et al., 2001; Alesch et al., 1993; Chang & Falit-Baiamonte, 2002; Durkin, 1984; Kroll et al., 1991; Runyan, 2006; Tierney, 1997). However, at the individual firm level, scholars are also starting to consider the relationships between the factors that might better predict recovery, through the development of models and use of multiple regression analyses (see for example: Corey & Deitch, 2011; Danes et al., 2009; Dahlhamer & Tierney, 1996; Haynes et al., 2011; Wasileski et al., 2011; Webb et al., 2002; Zhang et al., 2009). But at the community level, research has yet to examine the relative influence of these various business characteristics and disaster impact factors, meaning it remains unknown whether or not particular factors would be of greater importance or carry more weight in predicting recovery outcomes in a model that looks to forecast how well business recovery can be expected to proceed for the overall community. Future research should seek to bridge this gap by distinguishing any differences that may exist in the relative influence of the identified factors on community business recovery.

Assessing Business Recovery

While much of the research on business recovery has centered on identifying factors which are linked to better recovery outcomes for businesses, and thus can be used to predict business recovery, missing from the scholarly investigation is a discussion of how to assess business recovery progress, either at the individual firm level or at a community level. This section attempts to extrapolate from the recovery literature and a limited review of economic and supply chain literature, a series of factors that could be assessed as recovery proceeds to determine the progress of community business recovery. These factors are not exhaustive, but are offered as examples of the types of considerations local government officials could take into account when examining community business recovery.

In order to accurately assess how community business recovery is progressing, it would be important to also establish what the goals or the criterion would be for determining if or when recovery outcomes could be deemed successful (Quarantelli, 1999; Slack et al., 2010). In terms of advancing the development of a community business recovery model, establishing these goals or criterion of business recovery would be analogous to conceptualizing the model's dependent variable of community business recovery. Community business recovery could potentially be conceptualized in a variety of ways. For example, community business recovery could be defined in terms of restoring the community business environment to pre-disaster conditions, attaining the business environment that would have occurred without a disaster, or reaching a stable business environment that is different from either of the previously mentioned conditions (Chang, 2009). It would also need to be determined how these criterion for recovery success would be measured. Put another way, the concept of community business would need to be operationalized. The scope of this essay does not allow for any expansive discussion on this idea of conceptualizing and operationalizing community business recovery. This process of conceptualizing and operationalizing the dependent variable of community business recovery, as well as the operationalizing the factors that influence it, would be a critical next step in developing a testable model, albeit a step that will not be achieved through this current endeavor. As such, the factors specified below do not indicate any given outcome or suggested level of attainment that would constitute recovery for that factor.

Given that the characteristics of a business arguably do not change in the immediate aftermath of a disaster (for example, a large business is still going to be large), it would follow that assessing how the recovery process is progressing would be centered on evaluating how well community businesses are able to bounce back from the direct and indirect impacts of a disaster (Tierney, 1997; Tierney & Dahlhamer, 1996, 1998). Using this logic, many of the disaster impact factors that community leaders would use to predict business recovery, as outlined in the previous section, would also be appropriate for assessing recovery progress. Specifically, local leaders could continue to monitor the number and percentages of businesses within the local community that have physical damage to their property, as well as the progress businesses are making on repairs to this damage.

Local officials could track the number and proportion of businesses that are without the different lifeline services and the amount of impact the disruption continues to have on business operations/output. Continuing to track the number and percentage of businesses that are open versus closed would be another factor that could be assessed by local officials as they gauge the business recovery progress. Steady and continued progress on property repairs and lifeline restoration, as well as on the number of businesses re-opening would suggest positive moves towards business recovery. Any stagnation within these factors should be cause for local government to consider additional action or intervention in moving these factors forward.

Of the disaster impacts, research indicates that business recovery is highly contingent on minimizing or eliminating operational disruptions, which means businesses require sufficient suppliers to provide raw materials, employees to convert those raw materials to finished goods or services, and sufficient customers to purchase the final product (Corey & Deitch, 2011; Dalhamer, 1998; Dahlhamer & Tierney, 1998; Durkin, 1984; Kroll et al., 1991; Tierney, 1997; Wasileski et al., 2011; Webb et al., 2002). Without access to these “critical ingredients, recovery is impossible” (Alesch et al., 2009, p. 57). However, for those businesses whose markets are regional and national, often their suppliers and customer base exist outside of the disaster impact area, so the primary concern for these businesses is the availability of qualified employees (Alesch et al., 2009). For businesses whose primary customers live within the community, typically all of these “critical ingredients” are of utmost concern (Alesch et al., 2001; Alesch et al., 2009). Given the importance of the minimizing operational disruption to business recovery, particular attention should be given to assessing the elements of operational disruption—suppliers, employees, and customers.

An important factor across all three elements of business disruption would be understanding any transportation infrastructure disruptions, as such disruptions could influence the ability of suppliers to provide the necessary supplies, the ability of employees to get to work, and the ability of local customers to reach businesses or products to reach customers outside of the community (Webb et al., 2000, 2002). In considering suppliers, community officials should look at factors related to both supplier availability and adequacy (Alesch et al., 2001, 2009). As such, community officials could assess for the different business sectors the extent to

which businesses are receiving their necessary supplies, as well as the average supplier pricing levels, lead time, quality performance, and delivery performance (see for example: Doney & Cannon, 1997; Gunasekaran, Patel, & McGaughey, 2004; Wilson, 1994). In assessing employees, local leaders should take into account both employee quantity and quality (Alesch et al., 2001; Alesch et al., 2009). To determine the quantity of available employees within the community, local officials could assess population trends (Local & Regional Economic Analysis, n.d.), the unemployment rate (Local & Regional Economic Analysis, n.d.), the ratio of jobs to the number of employed residents (Coffey & Shearmur, 2001), and the ratio of jobs to housing units (Weitz, 2003). To assess employee quality, community officials could examine mean hourly wage (Local & Regional Economic Analysis, n.d.) and the education and training levels of residents (Alesch et al., 2001). In considering the level of customer demand, local officials could assess factors such as sales tax revenue by sector, household income levels, overall business sales and profitability, amount of retail sales, and gross regional product, to estimate how and the extent to which consumers are spending money within the local economy (Local & Regional Economic Analysis, n.d.). Whether these factors are evaluated against pre-disaster standards or a different set of criterion, all could be used to assess the recovery status of the primary elements of business operational disruptions—suppliers, employees, and customers—and could assist local government in determining if particular elements are still contributing to operational disruptions, or if certain sectors are facing greater operational challenges in the recovery period. Targeted actions or interventions could be undertaken by community leaders to locate missing elements in situations where gaps are identified. For example, if an assessment suggests that a shortage of qualified workers exists for a particular sector of the economy, local government could work with business leaders on efforts to recruit workers with the necessary skills and abilities from outside the jurisdiction.

In addition to the “critical ingredients” of disaster recovery, Alesch et al. (2001) suggest that the capacity of business owners to adapt and respond realistically to the new economic conditions that arise after a disaster is critical to the ability of businesses to recover. For example, if a residential area is so badly damaged that most of the business’s clientele has moved elsewhere, it would make little sense for a business to reopen in

the same location. A business owner with the ability to understand this shift in the market and adjust accordingly, by perhaps relocating a business, would have better recovery potential than a business owner who did not perceive this change (Alesch et al., 2001). The literature also suggests that regime uncertainty, which “occurs when officials announce conflicting policies or make conflicting statements about the prospects for, or desirability of, the recovery of a particular community” (Chamlee-Wright et al., 2008, p. 10), can hinder the efforts of the businesses to recover, as these businesses rely on clear signals from both the marketplace and community to make decisions in the recovery process (Chamlee-Wright et al., 2008; Runyan, 2006). In addition, Webb et al. (2002) note that when business owners perceive the broader business climate as positive, recovery is more likely.

Based on the findings noted above, an additional factor which leaders in the community should assess is if and to what extent business owners are objectively evaluating their own post-disaster chances of survivability and profitability throughout the recovery period and taking actions accordingly. If a community assessment finds that business self-evaluations and corrective actions are not occurring, local government could have the opportunity to provide technical or other forms of assistance to help businesses undertake self-evaluation efforts. Additional factors local officials could consider would be both the clarity of their own recovery plans and priorities, as well as their effectiveness in communicating those plans and priorities to businesses within the jurisdiction. And, government leaders could also assess how the overall community business climate is being perceived by business owners. If a community assessment at any point in the recovery period finds shortcomings in its clarity of plans or communications with businesses, or determines that all or parts of the business community are lacking confidence in the broader business climate, government officials have the opportunity to work with business leaders to correct course and facilitate better business recovery outcomes.

Conclusion

It is acknowledged that the growth and advancement of theory is important to the continued progression of any academic discipline, but within an emerging discipline, such as emergency management, developing a unique body of knowledge is critical as a means to legitimizing the field of study (Drabek, 2005; Jensen, 2010;

Klenow, 2009; McEntire, 2005). Models are crucial to theory building in disaster recovery in that models can “show theoretical links between different variables and relationships in or among groups” (McEntire, 2004, p. 3). Although falling short of creating a model of community business recovery, this essay provides the theoretical foundations for model development by synthesizing what research suggests would be key factors within such a model. By establishing which factors predict and influence business recovery at the community level, future research can then begin to examine how these factors may be/are linked and establish the relative importance of the relationships between the different factors in creating the different recovery outcomes. As noted by Smith and Wenger (2006), “as additional facilitators and impediments (to recovery) are identified and the relationships between them are described, a growing body of knowledge will emerge” (p. 248).

Even without defining the dependent variable of community business recovery or understanding the relationships between the different factors of community business recovery, professional emergency managers, local officials, and others involved in the distributed function of disaster recovery (Canton, 2007) can still benefit from this identification of the factors that could be used to predict or assess business recovery outcomes. By analyzing the factors suggested in this essay as influences to business recovery, emergency management practitioners can better engage local officials and businesses pre-disaster to provide an understanding of the recovery challenges that might be faced at the individual business and community level post-disaster and coordinate with both groups both before and after an event to identify and take action to minimize these challenges. Local leadership and others involved in the distributed function of disaster recovery (Canton, 2007) could also benefit as this is the first time the research has been synthesized with the express intent of providing guidance on what factors to examine in order to predict and assess business recovery at the community level. At the very least, these individuals will now have information on what to look at when considering community business recovery.

References

- Alesch, D. J., & Holly, J. N. (1997). Small business failure, survival, and recovery: Lessons from the January 1994 Northridge earthquake. *Proceedings of the NEHRP Conference and Workshop on Research on the Northridge, California Earthquake of January 17, 1994* (pp. 48-55). Richmond, CA: California Universities for Research in Earthquake Engineering.
- Alesch, D. J., Arendt, L. A., & Holly, J. N. (2009). *Managing long-term community recovery in the aftermath of disaster*. Fairfax, VA: Public Entity Risk Institute.
- Alesch, D. J., Holly, J. N., Mittler, E., & Nagy, R. (2001). *Organizations at risk: What happens when small businesses and not-for-profits encounter natural disasters*. Fairfax, VA: Public Entity Risk Institute.
- Alesch, D. J., Taylor, C., Ghanty, A. S., & Nagy, R. A. (1993). Earthquake risk reduction and small business. In *National Earthquake Conference Monograph No. 5: Socioeconomic impacts* (pp. 133-160). Memphis, TN: Central U.S. Earthquake Consortium.
- Boarnet, M. G. (1998). Business losses, transportation damage, and the Northridge earthquake. *Journal of Transportation and Statistics*, 1(2), 49-63.
- Brewton, K. E., Danes, S. M., Stafford, K., & Haynes, G. W. (2010). Determinants of rural and urban family firm resilience. *Journal of Family Business Strategy*, 1, 155-166.
- Canton, L. (2007). *Emergency management: Strategies and concepts for effective programs*. Hoboken, NJ: John Wiley & Sons.
- Chamlee-Wright, E., & Storr, V. (2008). *The entrepreneur's role in post-disaster community recovery: Implications for post-disaster recovery policy*. Fairfax, VA: Mercatus Center, George Mason University.

- Chang, S. E. (2009). Urban disaster recovery: a measurement framework and its application to the 1995 Kobe earthquake. *Disasters*, 34(2), 303-327.
- Chang, S. E., & Falit-Baiamonte, A. (2002). Disaster vulnerability of businesses in the 2001 Nisqually earthquake. *Environmental Hazards*, 4(2-3), 59-71.
- Coffey, W. J., & Shearmur, R. G. (2001). The identification of employment centres in Canadian metropolitan areas: the example of Montreal, 1996. *The Canadian Geographer*, 45(3), 371-386.
- Corey, C. M., & Deitch, E. A. (2011). Factors affecting business recovery immediately after hurricane Katrina. *Journal of Contingencies and Crisis Management*, 19(3), 169-181.
- Dahlhamer, J. M. (1998). *Rebounding from environmental jolts: Organizational and ecological factors affecting business disaster recovery*. Doctoral dissertation. Newark, DE: Department of Sociology and Criminal Justice, University of Delaware.
- Dahlhamer, J. M., & Tierney, K. J. (1996). *Winners and losers: Predicting business disaster recovery outcomes following the Northridge earthquake*. Preliminary Paper #243. Newark, DE: University of Delaware, Disaster Research Center.
- Dahlhamer, J. M., & Tierney, K. J. (1998). Rebounding from disruptive events: Business recovery following the Northridge earthquake. *Sociological Spectrum*, 18(2), 121-141.
- Danes, S. M., Lee, J., Amarapurkar, S., Stafford, K., Haynes, G., & Brewton, K. E. (2009). Determinants of family business resilience after a natural disaster by gender of business owner. *Journal of Developmental Entrepreneurship*, 14(4), 333-354.
- Doney, P. M., & Cannon, J. P. (1997). An examination of the nature of trust in buyer-seller relationships. *Journal of Marketing*, 61(2), 19-34.

- Drabek, T. E. (2005). Theories relevant to emergency management versus a theory of emergency management. *Journal of Emergency Management*, 3(4), 44-54.
- Durkin, M. E. (1984). *The economic recovery of small businesses after earthquakes: The Coalinga experience*. Paper Presented at the International Conference on Natural Hazards Mitigation Research and Practice. New Delhi, India, October 6-8.
- Gordon, P., Richardson, H. W., & Davis, D. (1997). Transport-related impacts of the Northridge earthquake. *Journal of Transportation and Statistics*(1), 21-36.
- Green, R., Miles, S., Gulacsik, G., & Levy, J. (2008). *Business recovery related to high-frequency natural hazard events*. Quick Response Report #197. Bellingham, WA: Huxley College of the Environment, Western Washington University.
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333-347.
- Haynes, G. W., Danes, S. M., & Stafford, K. (2011). Influences of federal disaster assistance on family business survival and success. *Journal of Contingencies and Crisis Management*, 19(2), 86-98.
- Klenow, D. J. (2009). Concepts, frameworks, and theory: Perspectives on the emergence of emergency management based theory. In J. A. Hubbard, *Ideas from an emerging field: Teaching emergency management in higher education* (pp. 93-100). Fairfax, VA: Public Entity Risk Institute.
- Kroll, C. A., Landis, J. D., Shen, Q., & Stryker, S. (1991). *Economic impacts of the Loma Prieta earthquake: A focus on small business*. Working Paper No. 91-187. Berkley, CA: University of California Transportation Center and the Center for Real Estate and Economics.

- Local & regional economic analysis*. (n.d.). Retrieved from Downtown and Business District Market Analysis: <http://fyi.uwex.edu/downtown-market-analysis/understanding-the-market/local-regional-economic-analysis/>
- McEntire, D. (2005). Emergency management theory: Issues, barriers, and recommendations for improvement. *Journal of Emergency Management*, 3(3), 44-54.
- Nigg, J. M., & Tierney, K. J. (1990). *Explaining differential outcomes in small business disaster loan application process*. Preliminary Paper 156. Newark, DE: Disaster Research Center, University of Delaware.
- Pearson, M. M., Hickman, T. M., & Lawrence, K. E. (2011). Retail recovery from natural disasters: New Orleans versus eight other United States disaster sites. *The International Review of Retail, Distribution and Consumer Research*, 21(5), 415-444.
- Phillips, B. (2009). *Disaster recovery*. New York: Taylor & Francis.
- Quarantelli, E. L. (1999). *The disaster recovery process: What we know and do not know from research*. Preliminary Paper #280. Newark DE: University of Delaware, Disaster Research Center.
- Runyan, R. (2006). Small business in the face of crisis: Identifying barriers to recovery from a natural disaster. *Journal of Contingencies and Crisis Management*, 14(1), 12-26.
- Slack, T., Myers, C. A., Singelmann, J., & Doucet, J. M. (2010). Impacts and activities following disaster: Narratives on recovery in hurricane-affected communities. *International Journal of Mass Emergencies and Disasters*, 28(1), 1-32.
- Smith, G., & Wenger, D. (2006). Sustainable disaster recovery: Operationalizing an existing agenda. In H. Rodriguez, E. L. Quarantelli, & R. Dynes (Eds.), *Handbook of disaster research* (pp. 234-257). New York: Springer Verlag.

- Tierney, K. J. (1997). Business impacts of the Northridge earthquake. *Journal of Contingencies and Crisis Management*, 5(2), 87-97.
- Tierney, K. J. (2006). Businesses and disasters: Vulnerability, impacts, and recovery. In H. Rodriguez, E. L. Quarantelli, & R. R. Dynes (Eds.), *Handbook of disaster research* (pp. 275-296). New York: Springer Science+Business Media, LLC.
- Tierney, K. J., Nigg, J. M., & Dahlhamer, J. M. (1997). The impact of the 1993 Midwest floods: Business vulnerability and disruption in Des Moines. In R. T. Sylves, & W. L. Waugh (Eds.), *Disaster management in the U.S. and Canada: The politics, policymaking, administration, and analysis of emergency management* (pp. 214-233). Springfield, IL: Charles C Thomas.
- Wasileski, G., Rodriguez, H., & Diaz, W. (2011). Business closure and relocation: A comparative analysis of the Loma Prieta earthquake and hurricane Andrew. *Disasters*, 35(1), 102-129.
- Webb, G. R., Tierney, K. J., & Dahlhamer, J. M. (2000). Businesses and disaster: Empirical patterns and unanswered questions. *Natural Hazards Review*, 1(2), 83-90.
- Webb, G., Tierney, K., & Dahlhamer, J. (2002). Predicting long-term business recovery from disaster: A comparison of the Loma Prieta earthquake and Hurricane Andrew. *Environmental Hazards*, 4, 45-58.
- Weitz, J. (2003). *Jobs-housing balance*. Planning Advisory Service Report Number 516. Washington D.C.: American Planning Association.
- Wilson, E. J. (1994). The relative importance of supplier selection criteria: A review and update. *International Journal of Purchasing and Materials Management*, 30(3), 35-42.
- Zhang, Y., Lindell, M. K., & Prater, C. S. (2009). Vulnerability of community businesses to environmental disasters. *Disasters*, 33(1), 38-57.

DO NOT COPY