

Organizational Adaptations and Dynamic Capabilities

How the Performance of Disaster Relief Nonprofits is Shaped under Uncertainty

by

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ABSTRACT

Applying the theory of dynamic capabilities, this research explores the procedures and the outcomes of adaptations in disaster relief nonprofit organizations. Using the in-depth interviews and survey data from the managers of disaster relief nonprofit organizations in Arizona, Florida, and New Jersey, this research answers three key questions: 1) How do disaster relief nonprofit organizations apply their dynamic capabilities to make adaptations? 2) What are the impacts of dynamic capabilities, including sensing, learning, integrating, and coordinating capabilities, on the performance of disaster relief nonprofit organizations in service provision, public policy engagement, and community social capital cultivation? 3) Taking the network of Voluntary/Community Organizations Active in Disasters (VOAD/COAD) as an example, can the dynamic capabilities of disaster relief nonprofit organizations explain the variation of network engagement and the gained benefits from the network among the VOAD/COAD members?

The results show that the procedures of adaptation in disaster relief nonprofit organizations are associated with a rhizomic rather than a linear approach, which is implied by the theory of dynamic capabilities. Strategic connectivity, temporal simultaneity, and directional flexibility are the three critical features of the rhizome model. Additionally, dynamic capabilities significantly influence organizational performance in service provision, public policy engagement, and social capital cultivation, although sensing, learning, integrating, and coordinating capabilities shape performance differently. Moreover, network engagement, as an uncommon practice for disaster relief nonprofit organizations, is also impacted by the dynamic capabilities of

disaster relief nonprofit organizations. The result shows that dynamic capabilities, especially learning capability, can promote the acquired benefits of disaster relief nonprofit organizations by bringing them more support in volunteer management and financial opportunities.

The findings not only advance the current discussion about nonprofit engagement in disaster management but also add knowledge on dynamic capabilities in the third sector. The exploration of adaptations in disaster relief nonprofit organizations and the operation of the VOAD/COAD network provides valuable implications to both nonprofit managers and government officials.

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CHAPTER 1

INTRODUCTION

This research aims to understand how disaster relief nonprofit organizations adjust to turbulent environments while continuously contributing to emergency and disaster management. This chapter defines the key concepts, reveals the purpose and significance of this study, and briefly introduces the structure of the dissertation.

Disaster Relief Nonprofit Organizations

Since 1980, the United States has experienced 291 billion-dollar weather and climate disasters, which cost \$1.9 trillion (NOAA National Centers for Environmental Information, 2021). Apart from conventional natural hazards, such as hurricanes, floodings, tornados, and wildfires, biosecurity and public health emergencies have also profoundly impacted society. The increasing frequency of disasters, the considerable socioeconomic losses, and the limitations of government resources in meeting the surging demand of disaster survivors call for a whole-community approach and active collaboration from multiple sectors (i.e., McGuire & Silvia, 2010; Demiroz & Kapucu, 2015; Eikenberry et al., 2007).

The expertise and proficiency in utilizing local resources, supporting vulnerable groups, and promoting public awareness of disasters demonstrate the complementary role of nonprofit organizations in addressing government limitations (Demiroz & Hu, 2014; Garcia et al., 2022; Chikoto-Schultz et al., 2019). Multiple frameworks, such as the National Response Framework (NRF) and National Disaster Response Framework (NDRF), also indicate the role of nonprofits in emergency and disaster management.

Disaster relief nonprofits, specifically refer to the formal 501 (c) (3) charitable organizations whose entire mission or partial commitment is to provide services in disaster settings, including disaster preparedness, mitigation, response, and recovery, play an important role in providing multiple types of services, such as distribution of basic needs resources, debris removal, and long-term recovery (Eller, Gerber & Branch, 2015), and strengthen the effectiveness of disaster management.

Current discussions regarding disaster relief nonprofit organizations focus on their crucial contributions to emergency and disaster management, and the collaborative approaches in their service provision (i.e., Kapucu & Hu, 2020; McGuire & Silvia, 2010; Simo & Bies, 2007). However, what is often ignored are the challenges these organizations encounter.

Environmental Change and the Adaptation of Disaster Relief Nonprofits

The reliance on external financial and human resources first makes disaster relief nonprofits more vulnerable to economic fluctuations and government budget cuts. Compared with the for-profit and public sectors, which sustain revenue through sales and profits or the power of taxation, nonprofit organizations rely on supporters for their charitable donations, government grants, fees, and in-kind gifts (Young, 2007). Disaster relief nonprofit organizations, which are a portion of human service nonprofits, are heavily funded by governments and the public (Giving USA, 2021). Thus, government shutdowns and shrinking budgets can significantly influence the available funding for disaster relief nonprofit organizations. Additionally, because of their mission, disaster relief nonprofits even need to address a surging request for service provision when they are experiencing disasters and vulnerability. The COVID-19 pandemic provides an

example. Lockdown policies and social distancing orders resulted in a shortage of volunteers and workforce for nonprofits to run programs, raise funds, and serve beneficiaries (Santos & Laureano, 2022). However, at the same time, disaster relief nonprofit organizations need to prepare and respond to other hazards (Quigley et al., 2020), such as tornadoes, hurricanes, and wildfires. A nonprofit providing shelter for disaster survivors in New Orleans, for example, needs to expand its facilities and transportation options to follow the rules of social distancing and quarantine. Mental health service was also requested from the staff and clients to tackle anxieties about virus transmission (Hutton et al., 2021). Furthermore, the rapid increase in the number of nonprofits in the United States has forced disaster relief nonprofit organizations to face fierce competition for financial resources (Botetzagias & Koutiva, 2014).

In order to address the tension between resource shortage and surging needs, as well as survive in such a turbulent environment, it is necessary for disaster relief nonprofit organizations to make adaptations. These adaptations involves organizational efforts in adjusting to the environment and seeking a balance between organizational structure and current environment (Staber & Sydow, 2002). However, there is only preliminary discussion about organizational adaptation in the nonprofit sector, and few have focused on disaster relief nonprofits. Existing literature mainly answers the questions of what adaptations appear in the nonprofit sector and what factors motivate the decision of organizational adaptations. The theory of organizational ecology, the resource dependence theory, and the neo-institutional theory provide multiple perspectives about why nonprofits take adaptive actions and apply innovations (i.e., DiMaggio & Powell, 1983; Hager, Galaskiewicz, & Larson, 2004; Gray & Lowery, 1996), while empirical

evidence also indicates that both external environment, such as financial crisis (Cooper & Maktoufi, 2019) and disasters (Chen, 2021), and organizational factors, including the mission (McDonald, 2007), the leadership (Jaskyte, 2004) and the culture (Brimhall, 2019) impact organizational change.

However, little research pays attention to how nonprofits, especially disaster relief nonprofits, successfully adapt to the environment. What capabilities support the successful adaptations and whether these capabilities will finally impact the performance of disaster relief nonprofit organizations are also underexplored.

Purpose Statement and Research Questions

Given the current research limitations and the necessity of adaptation for disaster relief nonprofit organizations, this research seeks to examine how these organizations thrive in dynamic environments while consistently enhancing disaster management efforts through organizational adaptations. This study applies the approach of dynamic capabilities, which refers to “the capacity of an organization to purposefully create, extend, and modify its resource base” (Helfat et al., 2007, p.4), as a framework to examine the procedures and underlying capabilities of organizational adaptation. Different from the operational capabilities that help an organization to make a living in the present, dynamic capabilities, including sensing, learning, integrating, and coordinating (Pavlou & El Sawy, 2011), allow an organization to reduce “the distance between an organization and its economic and institutional environments” (Sarta, Durand & Vergne, 2021, p.44).

Using interview and survey data collected from managers of disaster relief nonprofit organizations in New Jersey, Arizona, and Florida, this research utilizes mixed methods to answer the following questions:

1. How do disaster relief nonprofits deploy dynamic capabilities for organizational adaptations?
2. At the organizational level, are dynamic capabilities associated with better performance of disaster relief nonprofit organizations?
3. At the network level, do dynamic capabilities impact disaster relief nonprofits' network engagement and the associated benefits?

The first research question aims to understand the procedures of conducting adaptation in disaster relief nonprofit organizations using the interview data. This research also explores whether the linear approach implied by the theory of dynamic capabilities can successfully illustrate the adaptation process of disaster relief nonprofit organizations.

The second and third research questions examine the association between dynamic capabilities, which are the underlying capabilities of successful adaptation, and the performance of disaster relief nonprofits at both organizational and network levels. The second question tests the impact of dynamic capabilities, including sensing, learning, integrating, and coordinating, on the public value achievement of disaster relief nonprofits, which is measured by service provision, public policy engagement, and social capital cultivation.

Considering the common practice of collaboration and network engagement in the field of disaster management (McGuire & Silvia, 2010), the third research question utilizes the network of Voluntary Organizations Active in Disaster (VOAD) and Community Organizations Active in Disaster (COAD) as an example to analyze whether there is a significant difference of dynamic capabilities between VOAD/COAD members and non-members. Then, focusing on the group of VOAD/COAD members, the analysis based on the interview data indicates three dimensions of VOAD/COAD benefits while suggesting substantial variations of network engagement experiences among the members. The impact of dynamic capabilities on the benefits—volunteer support, financial opportunities, and reputation improvement— that member organizations can acquire from the network is examined to provide potential explanations.

Significance of the Research

Through exploring the procedures and underlying capabilities for adaptations in disaster relief nonprofit organizations, this research contributes to the discussion about nonprofit engagement in disaster management. It also provides implications to the practitioners, such as nonprofit managers and emergency managers in local government.

This research first serves as an opportunity to understand disaster relief nonprofit organizations, which play an important role in disaster management while being marginalized in the current discussion. Existing research in the field of disaster management explores the function of disaster relief nonprofits and their approaches to collaborating with government agencies and other nonprofit organizations (i.e., Waugh & Streib, 2006; Kapucu, 2006; Nolte & Boenigk, 2013). When putting disaster relief

nonprofits into the network, there is little discussion about the situation and dilemmas faced by these organizations. The heavy reliance on external environments, the tension between surging needs and resource shortage, and the fierce competition makes nonprofit vulnerable to survive and grow. This research pays attention to the adaptation of disaster relief nonprofit organizations and explores how they utilize their capabilities to address the changing environment while promoting their engagement in disaster preparedness, mitigation, response, and recovery.

This research also contributes to the discussion of nonprofit organizations by both bringing a new framework to understand nonprofit adaptation, and measuring organizational performance in multiple dimensions and levels. Instead of relying on the current framework of nonprofit adaptations, this research uses the theory of dynamic capabilities, which is well-developed in business management, to explore the procedures and underlying capabilities of nonprofit adaptations. Additionally, this research focuses on the public value achievement of disaster relief nonprofit organizations and tests the association between dynamic capabilities and nonprofits' disaster relief service provision, public policy engagement, and community social capital cultivation. Considering the practice of disaster relief nonprofits, this research also builds the framework to understand nonprofits' performance at the network level by emphasizing benefits acquisition as the primary goal of network engagement.

Expanding the discussion on the theory of dynamic capabilities through providing empirical evidence from disaster relief nonprofit organizations is another significance of this research. The theory of dynamic capabilities is widely used in the field of business management to explain organizational innovation, competitive

advantage, and performance (i.e., Helfat & Peteraf, 2015; Winter, 2003; Salvato & Rerup, 2011). Limited research has applied the theory to explain the behavior of public and nonprofit sectors (i.e., Peteraf et al., 2013; Trivellateo, Martini & Cavenago, 2021; de Costa et al., 2020). This research uses disaster relief nonprofits, which are actively providing service in a turbulent environment and addressing both organizational vulnerability and service requests simultaneously, as an example to examine the influence of dynamic capabilities on their performance at both the organizational and network levels. Additionally, rather than regarding dynamic capabilities as one variable, this research tests the impact of sensing, learning, integrating, and coordinating capabilities separately, which implies the potential association among these capabilities.

Through revealing the influence of dynamic capabilities and exploring the VOAD/COAD network, this research can also provide implications to disaster relief nonprofit managers and emergency managers at the local level. It first provides potential strategies for the managers of disaster relief nonprofit organizations to make adaptations and better adjust to the environment. The discussion at the network level also provides evidence-based suggestions for the managers to guide their network engagement activities. At the same time, as the coordinator of disaster management at the local level, emergency managers can get valuable information about how to support local disaster relief nonprofit organizations, make full use of the VOAD/COAD network, and promote the whole community approach to improve the effectiveness of emergency management.

Structure of the Dissertation

Chapter 2 provides the context of the emergency and disaster management frameworks in the United States and the role of disaster relief nonprofit organizations in emergency management based on government policies. Chapter 3 is a literature review to explore the current discussion about the adaptation of disaster relief nonprofit organizations and build the theoretical framework of this research. Chapter 4 illustrates the process of data collection, the overview of service provisions and adaptations of disaster relief nonprofits, and the applied analytical methods for the three key research questions.

The results of three research questions are exhibited in Chapters 5, 6, and 7. Chapter 5 reports the findings about the procedures of conducting adaptations in disaster relief nonprofits, followed by Chapters 6 and 7, which indicate the findings about the associations between dynamic capabilities and the performance of disaster relief nonprofits at both the organizational and network levels, respectively. Chapter 8 connects the three research questions and provides an overview of the purpose, the findings, and the contribution of this research.

CHAPTER 2

EMERGENCY MANAGEMENT AND DISASTER RELIEF NONPROFIT ORGANIZATIONS

Emergency Management in the United States

The past decades have witnessed the evolving of emergency management in the United States. Emergency management is regarded as a critical government responsibility, especially for local government. The Constitution indicates that local government accounts for public health and safety, while the federal government plays a secondary role in responding to public risks and emergency hazards (Haddow, Bullock, & Coppola, 2020). In 1803, Congress passed an act that allowed the federal government to engage in disaster response by providing financial assistance to a devastating fire in New Hampshire. In the later years, policies related to emergency management were largely about flood control (May & Williams, 1986). The occurrence of multiple major disasters in the early 1960s resulted in more involvement of the federal government in emergency and disaster management. Congress passed the National Flood Insurance Act of 1968, followed by the Disaster Relief Act Amendments in 1974 after the San Fernando earthquake, which authorizes the power of making financial contributions to state and local governments for post-disaster restoration and reconstruction (The American Institutes for Research, 2004). In 1979, FEMA was created based on Executive Order 12127, signed by President Carter, to incorporate emergency preparedness, mitigation, and response activities (Haddow & Bullock, 2003). Shortly, the Stafford Act was passed in 1988, amending the Disaster Relief Act of 1974. The Act authorizes the President to

support state and local government, private nonprofit organizations, and individuals in disasters (Federal Emergency Management Agency, 2013)

Getting into the 21st century, the criticism in responding to Hurricanes Katrina and Rita serves as an opportunity for government to reshape the emergency management system. Disaster relief nonprofit organizations are gradually engaged in the system formally.

The Role of Nonprofits in Emergency Management

Disaster relief nonprofit organizations have been actively engaged in emergency management since the 19th century. The American Red Cross (ARC) distributed food and relief supplies after a disaster in 1881 as the first organized aid for natural hazards (Rivera & Miller, 2006). The U.S. Congress also recognized the efforts of ARC and authorized one of its chapters to provide relief to disaster survivors in 1900 (U.S. Congress, 1995; Rivera & Miller, 2006). Although disaster relief nonprofit organizations continuously engage in disaster relief, their role in emergency management was not formalized and well-defined until the early 2000s (Rivera & Miller, 2006; Eikenberry et al., 2007). One of the lessons learned from Hurricane Katrina was that “The Federal response should better integrate the contributions of volunteers and non-governmental organizations into the broader national effort.” (White House, 2006, p. 64). The report also suggests state and local governments engage non-government organizations in their planning process and disaster response (White House, 2006).

In early 2008, the National Response Framework (NRF) replaced the National Response Plan (NRP) to guide all-hazards response and coordinate efforts from all levels of government, nongovernment organizations, and the private sector (Department of

Homeland Security, 2008). It emphasizes the role of nonprofit organizations (“*nongovernment organizations*” is used in the document) and mentions that “NGOs play enormously important roles before, during, and after an incident (Department of Homeland Security, 2008, p. 20)”. The framework also recognizes the supportive roles of disaster relief nonprofit organizations based on 15 Emergency Support Functions (ESFs). In 2011, the National Preparedness Goal was released under Presidential Policy Directive (PPD) 8: National Preparedness. The Goal highlighted the vision of nationwide preparedness and recognized core capabilities associated with mission areas, including prevention, protection, mitigation, response, and recovery. Following the guidance of the PPD 8, the Department of Homeland Security (DHS) has continuously published multiple plans and frameworks, such as A Whole Community Approach to Emergency Management (2011), the National Disaster Recovery Framework (2011), and the National Mitigation Framework (2013), to clarify the role and responsibilities of stakeholders. The functions of disaster relief nonprofit organizations are illustrated in these frameworks.

The National Mitigation Framework clarifies nonprofit organizations as voluntary organizations, faith-based organizations, national and professional associations, and educational institutions. These organizations show their advantage in assisting vulnerable groups, such as children, the disabled, and immigrants, and in educating the communities about mitigating hazard risks. The National Response Framework and the corresponding ESFs illustrate the role of nonprofit organizations in disaster response. The framework lists responsibilities of disaster relief nonprofit organizations, including volunteer and donation management, staff education, sheltering, emergency commodities and services

provision, assistance in animal evaluation, rescue and sheltering, logistic services, unmet needs identification, and supporting disaster survivors for recovery (DHS, 2019).

Multiple disaster relief nonprofit organizations are recognized as support agencies based on the 15 ESFs (See Table 1). Additionally, the role of disaster relief nonprofit organizations is identified in the National Disaster Recovery Plan. Nonprofits committed to animal rescue, housing, environment protection, veterans, and aging groups play important roles in disaster recovery. These nonprofits provide a wide range of services and utilize their expertise in communities to successfully implement inclusive and locally-led disaster recovery (DHS, 2016).

Table 1 Emergency Support Function at the Federal Level

ESFs	Disaster Relief Nonprofits
#1 Transportation	No
#2 Communication	No
#3 Public Works and Engineering	No
#4 Firefighting	No
#5 Information and Planning	Yes, but no specific organizations are listed.
#6 Mass Care, Emergency Assistance, Temporary Housing, and Human Services	American Red Cross
	National Center for Missing & Exploited Children
	National Voluntary Organizations Active in Disaster and its member organizations
	Other Nongovernmental Organizations
#7 Logistics	American Red Cross
	National Voluntary Organizations Active in Disasters (NVOAD)
#8 Public Health and Medical Services	American Red Cross
#9 Search and Rescue	No
#10 Oil and Hazardous Materials Response	No

ESFs	Disaster Relief Nonprofits
#11 Agriculture and Natural Resources	American Red Cross
	National Animal Rescue and Sheltering Coalition
	National Association of State Directors of Agriculture (501(c)(6))
	National Assembly of State Animal Health Officials (501(c)(6))
#12 Energy	No
#13 Public Safety and Security	No
#14 Cross-Sector Business and Infrastructure	No
#15 External Affairs	Yes, but no specific organizations are listed

State and local governments play a primary role in responding to disasters (Rivera & Miller, 2006). Depending on hazard types, the frequency of disasters, the socioeconomic losses, and the capability of state and local governments, the formal role of disaster relief nonprofit organizations in the response and recovery framework also shows differences at the state level. For example, as one of the states that experienced 81 billion-dollar disaster events between 1980 and 2023 and accounts for around 15% of all the losses in the United States (NOAA National Centers for Environmental Information, 2023), Florida builds the state emergency response team (SERT) as an inter-agency organization to improve the effectiveness disaster preparedness, mitigation, response, and recovery. In Florida, disaster relief nonprofit organizations engage in multiple branches and support ESFs. They are listed as supportive organizations for ESF #6 Mass Care, ESF #9 Search and Rescue, ESF #15 Volunteers and Donations, ESF #17 Animal Protection, and ESF #18 Business, Industry and Economic Stabilization. The primary role of disaster relief nonprofits is to support mass care. The American Red Cross, Catholic

Charities, Centers for Independent Living, Farm Share, Feeding Florida, Florida's Food Bank Network, Feed the Need, Florida Baptist Convention Disaster Relief, Mercy Chefs, Midwest Food Bank, Operation BBQ Relief, The Salvation Army, and World Central Kitchen provide multiple types of post-disaster relief services (Florida Division of Emergency Management, 2022). Besides disaster response, other nonprofit organizations, such as the Federal Alliance for Safe Homes (FLASH) and Volunteer Florida, are also listed in the State of Florida Enhanced Hazard Mitigation Plan (2018) to take the responsibility of assisting hazard mitigation in the pre-disaster stage.

New Jersey, which experiences only one-third of the economic losses in Florida (NOAA National Centers for Environmental Information, 2023), defines the role of disaster relief nonprofits differently. The emergency operation plan of New Jersey is not publicly available. However, the list of New Jersey State and Local Level Referrals, which is provided by FEMA (2022) and includes the programs to support disaster survivors in New Jersey, implies the potential role of disaster relief nonprofit organizations. The Community Food Bank of New Jersey (CFBNJ), the Legal Services of New Jersey (LSNJ), and the Volunteer Lawyers for Justice are the nonprofits that are recognized at the federal level for service referral. Additionally, the New Jersey VOAD is responsible for supporting ESF #5 and 6, including mass care, general preparedness efforts, and donations/volunteer management (New Jersey VOAD, 2016).

As an inland state with a limited frequency of disasters, Arizona is one of the states that has experienced less than \$10 billion in disaster losses in the past years (NOAA National Centers for Environmental Information, 2023). The Arizona State Emergency Response and Recovery Plan (2019) lists 15 ESFs and 6 Recovery Support

Functions (RSFs). The primary goals of disaster relief nonprofit organizations are to support ESF#6 Mass Care, ESF#7 Logistics, ESF#8 Public Health and Medical Services, and ESF#14 Recovery (with 6 RSFs). AZ Humane Society (AZHS), AZ Voluntary Organizations Active in Disaster (AZ VOAD), American Red Cross (ARC), the Salvation Army (TSA), and the Mental Health Association of Arizona (MHAAZ) are identified nonprofits in the plan.

Florida and Arizona list disaster relief nonprofit organizations as important stakeholders in disaster management and emphasize their role in supporting mass care and long-term recovery. With publicly accessible documentation, the role of disaster relief nonprofits in New Jersey is vague. Still, mass care and legal support are two services that nonprofits, at least, are involved in. Florida lists multiple disaster relief nonprofit organizations that focus on feeding and sheltering but does not include Florida State VOAD as one of the supportive organizations. In contrast, Arizona and New Jersey do not recognize as many disaster relief nonprofit organizations as Florida does, especially for the service of mass feeding. Arizona includes AZ VOAD as coordinators to connect government agencies with other disaster relief nonprofit organizations. Additionally, compared with the other two states, Arizona emphasizes the role of disaster relief nonprofit organizations in disaster recovery and lists the supportive organizations under each of the recovery support functions.

Voluntary Organizations Active in Disaster

The national frameworks and state-level emergency response and recovery plans indicate the importance of the VOAD as a network for disaster relief nonprofit organizations to share information and develop partnerships (Wieland, 2009). Founded in

1969 after Hurricane Camille, the VOAD aims to promote cooperation, communication, coordination, and collaboration in responding to disasters. It serves as the primary point of contact for voluntary organizations' coordination (Department of Homeland Security, 2019). Many nonprofit organizations that provide disaster relief services, such as the American Red Cross, Catholic Charities, All Hands and Hearts, and Team Rubican, are VOAD members.

There are multiple levels of VOAD. National VOAD has more than 70 member nonprofit organizations and 56 state members. Each state/territory has state VOAD to facilitate coordination and collaboration during a local or regional disaster. There are also Community Organizations Active in Disasters (COAD) at the local level. COADs show their advantage in responding faster in the aftermath of a local disaster and support the long-term recovery of the community. State VOAD generally has a seat at the state Emergency Operations Center (EOC) to contact nonprofit organizations to engage in disaster response. The County-level COAD also acts as a single point of contact for emergency managers to update information and request services from community-based nonprofit organizations (The Center for Disaster Philanthropy, 2022).

As previously mentioned, the importance of state VOAD among states is also inconsistent. For instance, the Arizona State Emergency Response and Recovery Plan (2019) clarifies the role of AZ VOAD in both disaster response and recovery. AZ VOAD is a supportive organization for multiple response and recovery functions, including ESF#6 Mass Care, ESF#7 Logistics, ESF#8 Public Health and Medical Services, and ESF#14 Recovery. Among the 6 RSFs, the AZ VOAD supports RSF#1 Community Planning and Capacity Building, RSF#3 Health and Social Services, RSF#4 Housing,

RSF#5 Infrastructure Systems, and RSF #6 Natural and Cultural Resources. However, the role of state VOADs in New Jersey and Florida is much more limited than that in Arizona. In New Jersey, the primary supportive function of state VOAD is mass care, while in Florida, the state VOAD is not formally listed as a supportive organization for any of the ESFs.

The state variations impact the role of COADs in county-level emergency and disaster management. At the same time, the local government may also recognize the importance of COADs even when the state VOAD is not actively engaged in state-level response and recovery. For instance, in Florida, the state VOAD is not recognized in multiple plans. However, in Santa Rosa County, the COAD, known as SAFER (Support Alliance for Emergency Readiness), is one of the supportive organizations under ESF#15 Volunteers and Donations (Santa Rosa County Division of Emergency Management, 2019). In Arizona, the Maricopa County COAD is actively integrated with emergency management. It takes responsibility for planning, preparedness, and response through viewing county-level plans. They are seated at the planning table and the Emergency Operational Center (Maricopa County COAD, 2022).

Moreover, there is overlap among the members of NVOAD, state VOADs, and COADs. For instance, HandsOn Greater Phoenix is a member of both Arizona VOAD and Maricopa County COAD, while St. Vincent DePaul in New Jersey is a board member of New Jersey VOAD and leads the Monmouth County COAD. Considering the overlapping between VOADs and COADs and the importance of local-level disaster relief nonprofits, this research focuses on both state-level VOADs and local COADs.

Conclusion

Disaster relief nonprofits have been engaged in emergencies and disaster relief nonprofits since the 19th century, although they were not formally integrated into the emergency management framework until the early 2000s. The response failure to Hurricane Katrina indicated the importance of disaster relief nonprofit organizations and encourages the government to promote the effectiveness of emergency management systems through publishing multiple frameworks, such as National Preparedness Goals, National Response Framework, and National Disaster Recovery Framework. When comparing various state-level frameworks across diverse geographic regions with varying degrees of disaster losses, the result shows that the primary function that disaster relief nonprofits support is mass care. While in some states, nonprofits also take broader responsibility in logistics, public health and medical care, and support in most recovery functions. The importance of VOAD in promoting communication, cooperation, and collaboration between government and disaster relief nonprofits is recognized by both the national level framework and some states. However, in other states, such as Florida, VOAD is not regarded as a supportive organization for disaster response and recovery. The responsibility variations among states also imply the necessity to conduct research in multiple states.

CHAPTER 3

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The research purpose of exploring the adaptation of disaster relief nonprofit organizations guides a literature review of nonprofit adaptation and the theory of dynamic capabilities. While the importance and the role of disaster relief nonprofits have been discussed in Chapter 2 based on multiple frameworks of emergency management at national and state levels, current literature regarding nonprofit organizations in natural disasters is included in this chapter, followed by the performance of disaster relief nonprofit organizations, and the association between dynamic capabilities and their performance at both organizational and network levels.

Nonprofit Organizational Adaptation and Change

Organizational adaptation, which describes the fitness and efficiency of organizational structure in the current environment (Staber & Sydow, 2002), is “the primary purpose of strategic management” (Chakravarthy, 1982, p. 35). Existing research on nonprofit adaptation focuses on exploring the forms of adaptation and understanding organizational motivations to undertake adaptive actions. Structural change and service provision adjustments are two common types of adaptation.

On the one hand, acquisitions, parent-subsidiary relationships, consolidations, and mergers are structural adjustments that have been discussed in existing nonprofit literature. Acquisition occurs when there are unequal organizations and refers to the process by which one organization is entirely absorbed into another. The parent-subsidiary relationship represents a distinctive legal arrangement in which one organization exercises governance over another (Campbell, 2009). Consolidation refers

to a change that both organizations resolve to be a new entity (Singer & Yankey, 1991). Moreover, the act of merging is considered a positive strategy for combining organizations (Benton & Austin, 2010). Fischer's research (2017), based on 75 nonprofits, reveals that the motivation for restructuring and merging is to maximize financial resources, achieve economic efficiency, and respond to requirements from funders. Likewise, other research also indicates that nonprofits apply reconstruction and mergers as a strategy for the aim of surviving, maintaining missions (Benton & Austin, 2010), and corresponding to financial restraints and budget cuts (Cooper & Maktoufi, 2019).

On the other hand, instead of taking significant reconstructive tactics, some nonprofits choose to change the way of service provision, such as adding new programs, reducing programs, starting joint programs, and getting involved in advocacy (Mosley, 2012). For example, during COVID-19, with the dramatic change in the external environment, nonprofits were required to implement social distancing, address the increasing needs, and balance financial limitations. They made adaptations, such as freezing discretionary spending and hiring, delaying maintenance, seeking financial assistance from federal agencies, and reducing service provision to adjust to the environment (Maher, Hindery & Hoang, 2020). Plaisance (2022) uses empirical evidence from France to show that around 60% of nonprofit organizations experience reforms, such as digitalization, governance restructuring, and partnership development. Cases from the United States (Shi et al., 2020) also show that humanitarian organizations change their case management service through digital transformation. Building new

collaborative relationships to address the tension between surging needs and resource limitation is also a critical adaptive action.

Some theories indicate that external environments motivate organizations to change. Resource dependence theory holds the view that organizations are not autonomous. They are constrained by other organizations and macro-level environments, such as political and economic resources (Hillman et al. 2009). In order to survive and acquire critical resources, nonprofits need to adjust their behavior to satisfy the demands of stakeholders. For instance, government agencies often collaborate with nonprofits that exhibit a strong bureaucratic orientation, possess a well-established history of government funding, and share a substantial domain consensus with the government (Lu, 2015). Thus, nonprofits who want financial support from the government need to adjust their behavior and even engage in tasks outside their missions, which may cause mission drift (Bennett & Savani, 2011). There is a mix of adaptive tactics, including retrenchment, expansion, collaboration, and advocacy, for nonprofit organizations to navigate economic crises with the goal of ensuring their survival (Salamon, Geller & Spence, 2009). A study conducted in New Jersey shows that under the Great Recession, nonprofit organizations with higher operating margins and equity ratios have a relatively higher ability to adjust to the environment and generate revenue (Lin & Wang, 2016).

Getting legitimacy, which is defined as “a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs or definitions” (Suchman, 1995, p.573), is another reason for organizational change based on the neo-institutional theory.

Organizations adjust their structures and operational approaches because of the coercive,

mimetic, and normative pressure to pursue legitimacy (DiMaggio & Powell, 1983). Hager, Galaskiewicz, and Larson (2004) explore the structural change of nonprofits, specifically, the closeness of nonprofit organizations, from the perspective of organizational legitimacy. Instead of only being influenced by age, size, and competition, the closeness of nonprofit organizations also relates to network embeddedness and legitimacy. Nonprofits with ties to government and other organizations experience a lower level of risk for closeness.

Furthermore, the organizational ecology theory implies the necessity of organizational adaptation by indicating the importance of density. Organizations in a niche with less density experience a lower level of competition for resources (Gray & Lowery, 1996), whereas operating in sparsely populated niches is risky. An organization that is greatly different from the majority of existing organizations will lead to distrust from funders, recipients, and other stakeholders, which makes it hard for them to gain constitutive legitimacy to continue their growth (Hannan & Carroll 1992). So, there is a nonmonotonic U shaped connection between population density and organizational closure (Hannan & Freeman, 1989). In the first phase within a niche, organizations experience a higher level of risk because of the low constitutive legitimacy of the population. As the niche grows, there will be an increase in legitimacy and subsequent competition for resources (Harrison & Carroll, 2001). Also, the change in organizational density within the niche requires nonprofit organizations to make adaptations for more resources.

Organizational managers play an essential role in deciding organizational adaptation. Scholars find that adaptation occurs when managers develop necessary

strategies to acquire resources, reduce management costs, and maintain organizational development (Galaskiewicz & Bielefeld, 1998). For the aim of increasing autonomy and decreasing reliance on a specific funder, it is not uncommon for nonprofits to diversify their funding resources (Mitchell, 2014) and make more efforts in fundraising. Peters and Waterman (1982) point out the importance of managers because they can create and change organizational culture, which determines the behavior of organizational adaptation. Managers can show their influence on lending power and legitimation to innovations (Hasenfeld, 1983). Furthermore, the board characteristics, such as size, diversity, and effectiveness, can significantly impact organizational innovation (Jaskyte, 2015). McDonald (2007) also provided evidence showing that nonprofit mission mediates the relationship between organizational adaptation and performance.

To summarize, in order to survive and achieve organizational mission, nonprofits continue to take adaptive actions, ranging from comprehensive structural change to service provision and operational adjustments. Although the significance of nonprofit adaptation in impacting organizational survival is obvious, previous literature pays more attention to the influence of external environments, such as financial crisis (Cooper & Maktoufi, 2019), policy change, and legitimacy (Hager, Galaskiewicz & Larson 2004), and emphasize the importance of organizational managers, board structure and organizational culture (i.e., Pablo et al., 2007; Jaskyte, 2015). Nevertheless, it does not answer two key questions: 1) How do these changes happen (Piening, 2011) in nonprofits? Specifically, what are the procedures and strategies? 2) Why nonprofits can successfully conduct adaptations? What are the underlying capabilities to support the practice? Additionally, it is still uncertain whether or not organizational routines and

capabilities in adjusting changes can result in different levels of organizational performance. A new theoretical perspective is needed to explore the above questions.

Organizational Dynamic Capabilities

The Definition of Dynamic Capabilities

The approach of dynamic capabilities, first introduced by Teece and colleagues (1997), indicates a specific class of meta-capability for organizational adaptation, innovation, and change (Piening, 2011). Although there is no consensus on the definition of dynamic capabilities, it is applied to describe the reconfiguration of operational capacities to tackle a turbulent environment (Pavlou & El Sawy, 2011). Teece, Pisano, and Shuen (1997, p. 516) regard dynamic capabilities as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments.” Zollo and Winter (2002, p. 340) define it as “a learned and stable pattern of collective activity through which organizations systematically generate and modify operating routines for improved effectiveness.” The capability-routine dichotomy implies different perspectives from scholars, but they are not inconsistent since “a capability is, in essence, a routine, or a number of interacting routines” (Grant, 1991, p. 122).

Dynamic Capabilities in the Public and Nonprofit Sectors

As a concept originated from the for-profit sector, dynamic capabilities are efficient in explaining organizational competitive advantage and innovation in a rapidly changing environment (Teece, 2007). Existing literature based on the for-profit sector has explored the antecedent, consequence, and mediators of dynamic capabilities. Scholars in various countries (i.e., the UK, Germany, the US, and Australia) applied the concept of dynamic capabilities in public organizations, such as hospitals, local authorities, and

public schools. The performance crisis, external pressure, managers' perception of available resources, and historical experiences can impact the dynamic capabilities of the public sector (Piening, 2013). These capabilities can also impact the success of product innovation in municipalities (Vera & Crossan, 2005) and enable the clinical department to adapt to a new reimbursement system (Ridder et al., 2007). Besides the antecedents and consequences of dynamic capabilities, Pablo and his coauthors (2007) also use the Calgary Health Region as an example to explore the process of generating a new strategic approach using dynamic capabilities. A successful public organizational innovation in the health region requires the leaders to identify dynamic capabilities, use them, and balance the tension between the unrestricted development of local initiatives and the needs for control. Trivellato and his coauthors (2021) find that collaborative innovation can help public organizations improve dynamic capabilities, which will, in turn, sustain long-term innovation.

In addition, several scholars use the theory of dynamic capabilities in the nonprofit sector. Kaltenbrunner and Reichel (2018) utilized survey data based on refugee aid to indicate that participative leadership positively impacts dynamic capabilities, and the association between leadership and dynamic capabilities is mediated by managers' perception of their authority. Based on evidence from 169 Brazilian nonprofit organizations, de Costa and coauthors (2020) find that dynamic capabilities are important for the performance of nonprofit organizations.

Existing literature on dynamic capabilities first indicates its importance in promoting organizational adaptation and innovation. It also implies that although research on dynamic capabilities is centered in the for-profit field, the concept is also

applicable in the public or nonprofit sectors (Pablo et al., 2007; Kaltenbrunner & Reichel, 2018). However, considering the limited discussion in the nonprofit sector, it is necessary to conduct in-depth research, especially applying the concept to disaster relief nonprofit organizations that are actively providing service in uncertain environments.

Measurements of Dynamic Capabilities

The diverse definitions of dynamic capabilities are associated with different measurements. Wang and Ahmed (2007, p.36) regard dynamic capabilities as “the ultimate organizational capabilities that are conducive to long-term performance,” which can be measured by adaptive, absorptive, and innovative capabilities. Adaptive capability is the capacity to sense new opportunities, while absorptive capability is to recognize the value of new information, assimilate it, and apply it (Cohen & Levinthal, 1990). These two capabilities will lead to innovative capability because, in the private sector, the function of dynamic capabilities reflects on the innovation of new products or the involvement in new markets. Different from the for-profit sector, adaptations are not always for product innovation and substantial change in services, they include both developing new areas radically and achieving changes incrementally (McNulty & Ferlie, 2004). Teece (2007) measures dynamic capabilities as sensing, seizing, and reconfiguring/ transforming based on the procedures of change. Sensing means identifying opportunities to meet customer needs, seizing involves resource mobilization to address needs, and reconfiguring/transforming indicates “continued renewal” (Teece, 2014, p332). With the framework, some scholars create corresponding measurements and provide empirical evidence using cases from diverse environments (i.e., Kump et al., 2019; Wilden et al., 2013).

Built on the framework of Teece (2007), Pavlou & El Sawy (2011) emphasize that dynamic capabilities aim to reconfigure and update the operational capabilities of the organizations to adjust to environmental turbulence. Sensing is the ability to pursue opportunities in the environment. Learning is about “revamping existing operational capacities with new knowledge.” Integrating describes the routine of transforming new knowledge at the individual level to the consensus and agreement within the organization, which also refers to internal learning and timely decision-making capability (Li & Liu, 2014). And coordinating capability is related to implementation, which includes the deployment of “tasks, resources, and activities in the new operational capabilities” (Pavlou & El Sawy, 2011, p.247).

The framework has shown its reliability and validity in measuring dynamic capability in the private and public sectors (Pavlou & El Sawy, 2011). It regards learning as a separate phase. As a critical dynamic capability to support organizational change, learning capability is viewed as the second-order dynamic capability (Winter, 2003). Winter (2003) thinks that there are three levels of organizational capabilities. Zero-order capabilities are the operational capabilities that aim to support organizations to “earn a living by producing and selling the same product, on the same scale and the same customer population” (p. 992). In contrast, first-order capabilities are dynamic capabilities, which can be categorized as lower-order/first-order and higher-order/second-order dynamic capabilities. Organizational learning is the second-order capability to modify the first-order and zero-order capabilities. Furthermore, this framework also includes integrating capability, which illustrates the transfer of knowledge from the individual to the organizational level, to partly present the organizational decision-

making process. Observing the procedure is also essential in this study about disaster relief nonprofits because they are required to make decisions in a prompt way when a disaster happens.

Nonprofit Organizations in Emergency Management

Nonprofit organizations, which share characteristics of “formal, private, non-profit-distributing, self-governing and voluntary” (Salamon & Anheier, 1992, p. 125), actively engage in disaster management. Government limitations in responding to Hurricane Katrina raise the discussion on the role of nonprofit organizations in enhancing the efficiency and effectiveness of disaster management (Kapucu, 2006; Palomo-Gonzalez & Rahm, 2008). As mentioned in Chapter 2, after Hurricane Katrina, nonprofit organizations have been gradually involved in emergency management frameworks. The change also flourishes the discussion of nonprofits’ role in emergency management in academia. Shaw and Izumi (2014) suggest that the increasing demands and limited government resources result in active nonprofit engagement after a disaster. The expertise and the capability of deploying local resources (Demiroz & Hu, 2014) highlight the complementary role of disaster relief nonprofits in mitigating government limitations. They demonstrate their significance by not only raising public awareness in the pre-disaster phase but also by offering humanitarian aid and professional support in the aftermath of a disaster (Acosta & Chandra, 2013). Two topics, the cross-sector and within-sector collaboration, as well as the role and strategies applied by nonprofits to improve performance in disasters, have been discussed in the existing literature.

Firstly, the necessity of collaboration and the methods used to improve the partnership between nonprofit organizations and government in disaster settings is a

primary research topic in the field (Waugh & Streib, 2006; Kapucu, 2006; Nolte & Boenigk, 2013). Some scholars suggest that collaboration yields many benefits, such as “economic efficiencies, greater service quality, organizational learning, access to new skills, diffusion of risk, improved public accountability, the ability to buffer external uncertainties, and conflict avoidance” (Gazley, 2010, p. 53). In order to take advantage of collaboration and improve network performance, interoperability, which refers to the operational element of integrating different stakeholders and a technical element of cross-organizational communication, is regarded as a significant factor for the performance of collaboration (Kapucu, Arslan & Demiroz, 2010). Formal contracts, prior working experience, the intensity of shared goals, and the investment in the partnership can also decide the performance of collaboration between government and the nonprofit sector (Gazley, 2010). Additionally, within-sector collaboration attracts some attention from scholars. Contextual factors, such as the demands and infrastructure in the affected region, and inter-organizational factors, including the power structure, the capability, and the competition among collaborators, impact within-sector collaboration based on the case of interaction among humanitarian organizations (Moshtari & Gonçalves, 2017).

The role of disaster relief nonprofits and the strategies for them to promote performance is another important topic in the existing literature. Disaster relief nonprofits are responsible for distributing basic needs resources, removing debris, conducting long-term recovery, repairing and rebuilding houses, and managing volunteers (Eller, Gerber & Branch, 2015). In order to improve information disclosure and ultimately promote organizational capability, the strategies of using social media, such as Twitter and

hashtags, to attract public attention have been discussed as the marketing strategies for nonprofit organizations in disaster contexts (Wukich & Steinberg, 2013).

However, the majority of current research first adheres to the conventional disaster management paradigm, emphasizing the predominant role of government while overlooking the significance of disaster relief nonprofit organizations (Aldrich, 2008). Little research takes the influence of environmental change, such as climate change, the COVID-19 pandemic, and the overwhelming service requests, into consideration and explores how disaster relief nonprofit organizations are self-resilient while at the same time maintaining their organizational performance in service provision and community engagement.

The Performance of Disaster Relief Nonprofits

The ultimate purpose of disaster relief nonprofits is not just to be financially sustainable and gain comparative advantage, as the enterprises do, but to achieve organizational social mission. Furthermore, as a vital stakeholder in disaster management collaboration, the performance of disaster relief nonprofit organizations at the network level also encompasses a critical perspective when exploring their performance.

Disaster Relief Nonprofit Performance: at the Organizational Level

The mission and characteristics of disaster relief nonprofit organizations make it hard to evaluate their performance. Forbes (1998) points out that developing quantitative measures for nonprofit organizations, in general, is difficult since their goals are amorphous and intangible. The diversity of the services nonprofits provide makes it hard to create accepted universal measures for performance (Grant & Crutchfield, 2008).

Some scholars pay attention to financial performance, which is necessary for nonprofits to accomplish their organizational values (Bryce, 1992). The indices proposed by Ritchie and Kolodinsky (2003) assess fundraising efficiency, level of public support, and fiscal performance of nonprofit organizations. The administrative ratio, which indicates management and general expenses to total expenses, is also helpful for understanding organizational operations and financial performance (Coupet & Broussard, 2021; Berrett & Holliday, 2018).

Services provision is another common approach when evaluating nonprofit performance. The frequency and time of service provision, the number of service recipients (Bagnoli & Megali, 2011), and the quality of services, including physical and cultural accessibility, timeliness, courteousness, and physical condition of facilities (Newcomer, 1997), are applied to measure the outputs of the nonprofit organizations from an objective way. Scholars use self-assessments from organizational managers to evaluate nonprofit performance (Shoham et al., 2006), such as the perceived quality of services, client satisfaction, and the achievement of organizational mission (Brown, 2005).

Paying attention to the mission and role of the nonprofit sector, Moore (2003) suggests that public value achievement is a better way to assess community-oriented outcomes. It includes the service provision or the satisfaction of the service recipients and the broader benefits nonprofits can bring to society. Moulton and Eckerd (2012) listed the public value of nonprofits as service provision, innovation, advocacy, individual expression, social capital creation, and citizen engagement. Service provision measures the contribution of nonprofits in providing qualified service and solving unmet needs

(Amirkanyan, Kim & Lambright, 2008); Innovation is about offering new approaches or methods for existing social problems (Chinnock & Salamon, 2002); Advocacy refers to the influence on political policy and government behavior; Individual express evaluates the allowance of participants' expression; Social capital creation is for the community trust and resilience; Citizen engagement is about public education and participatory democracy (LeRoux, 2007).

Specifically for the performance of disaster relief nonprofit organizations, the efficiency and effectiveness of service provision is the primary perspective in evaluating their performance since they take the responsibility of mass care (Eller, Gerber & Branch, 2015). Innovation, which refers to new approaches to social issues, will ultimately reflect on the quality of service provision and contribution to community resilience. Thus, it is not regarded as a separate category in measuring the performance of disaster relief nonprofits. Advocacy and individual expression are defined as public policy engagement. Because, on the one hand, this research only focuses on disaster relief nonprofits as service providers in a disaster setting, nonprofits committing to advocacy for disaster survivors are not included. On the other hand, collaborating with government agencies and engaging in disaster-related public policy to speak volumes of the needs of vulnerable groups are common practice and aligns with the social mission of disaster relief nonprofit organizations. To reflect the practice while not emphasizing advocacy, this research combines advocacy and individual expression perspectives as public policy engagement. Additionally, social capital creation and citizen engagement show overlap as encouraging civil engagement is an important approach for nonprofit and community groups to accumulate community social capital (Viswanath, Steele & Finnegan, 2006).

Thus, this research uses disaster relief service provision, public policy engagement, and social capital cultivation as three dimensions to measure the performance of disaster relief nonprofit organizations.

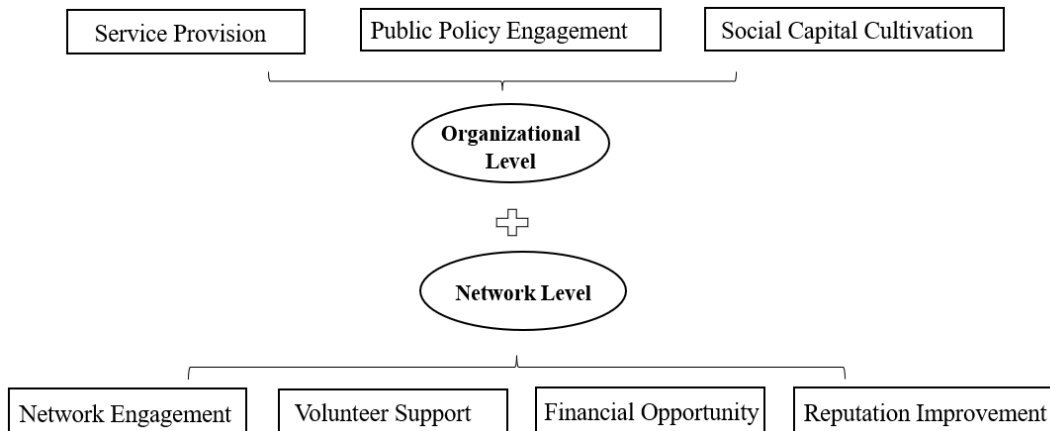
Disaster Relief Nonprofit Performance: at the Network Level

It is not uncommon for disaster relief nonprofits to engage in intra-sector and inter-sector collaborations since the nature of emergency management requires a whole-community approach to includes multiple levels of government, the private sector, nonprofit organizations, communities, and even individuals (Waugh & Streib, 2006). Nonprofit organizations are critical in multiple phases of disaster management. The National Response Framework (NRF) recognizes nonprofits with disaster response capabilities, especially the American Red Cross, the National Voluntary Organizations Active in Disaster (NVOAD), and the National Center for Missing & Exploited Children (NCMEC) (U.S. Department of Homeland Security, 2019). There is an increased engagement of disaster relief nonprofit organizations, especially the NVOAD network member organizations (Kapucu et al., 2011). Thus, observing the performance of disaster relief nonprofit organizations at the network level is also critical.

From the perspective of disaster relief nonprofit organizations, being a member of VOADs or COADs is a decision based on the costs and benefits analysis. Engaging in the network is not cost-free (Huxham & Vangen, 2005). It requires nonprofit organizations to sometimes pay the membership fee and to invest time and resources. With the potential cost associated with becoming a VOAD/COAD member, disaster relief nonprofit organizations also evaluate the potential benefits they can acquire. Obtaining critical resources, managing environmental uncertainties, and meeting the expectations of

stakeholders encourage nonprofit organizations to be involved in a network (Guo & Acar, 2005). Gaining valuable information from the network to better maintain organizational-level mission achievement is the primary motivation for network engagement. Using VOAD as a case, Wieland (2009) indicates that coalition building, strategic partnership, and reduced duplication in services are the main reasons for members to participate in VOAD (Wieland, 2009). Information accessibility, financial support, human resources, and legitimacy are the benefits for those members who show a higher level of network embeddedness (Svare & Gausdal, 2017). Information brings value to member organizations, but it ultimately contributes to organizational operations through improving their financial and human resource availability or promoting their reputation with strong legitimacy. Considering the importance of volunteers for disaster relief nonprofit organizations to conduct service provision, the benefits of the VOAD/COAD network are defined as volunteer support, financial opportunities, and reputation improvement, which is also explored through the interview data in the following analysis. The summary of the performance measurements for disaster relief nonprofit is shown in Figure 1.

Figure 1. The Performance Measurements of Disaster Relief Nonprofits



Dynamic Capabilities and the Performance of Disaster Relief Nonprofits

Dynamic Capabilities and Public Value Achievement

There are different views about the impact of dynamic capabilities on performance. Some scholars think that dynamic capability may not be able to improve organizational performance. Because utilizing and maintaining dynamic capabilities requires a significant commitment of organizational resources, the substantial cost may outweigh the potential benefits and not contribute to better organizational performance (Helfat & Peteraf, 2015; Winter, 2003; Zahra & George, 2002). In addition, dynamic capabilities are different from operational capabilities, which guide the everyday activities of an organization and decide the performance directly. The approach for dynamic capabilities to impact organizational performance is through operational capabilities (Salvato & Rerup, 2011). Furthermore, some research indicates that dynamic capabilities are “particularly valuable in turbulent environments where technological, regulatory, and competitive conditions change rapidly” (Piening, 2013). For organizations that, on average, experience a relatively stable environment, the influence may be diminished.

In contrast, empirical evidence shows that maintaining and improving dynamic capabilities is critical for better performance, especially in fast-paced environments (Teece, 2014). Organizations with better dynamic capabilities are associated with higher operational efficiency and an increased alignment with the environment (Peteraf et al., 2013). Dynamic capabilities can enhance organizational innovation in the long run in both private and public settings (Trivellato, Martini & Cavenago, 2021). Based on evidence from 169 Brazilian nonprofit organizations, de Costa and coauthors (2020) also

find that dynamic capabilities have a direct and significant influence on nonprofit performance. Likewise, Chmielewski and Paladino (2007) also find that dynamic capabilities underlie organizational change and adaptation (Wang & Ahmed, 2007) and ultimately improve effectiveness and efficiency in responding to environmental change.

Although the total effect of dynamic capabilities on nonprofit performance has been discussed, limited research examines the various impacts of sensing, learning, integrating, and coordinating capabilities on organizational performance. Su and coauthors (2014) indicate that sensing capability improves the consistency of product quality, while learning capability is associated with a high quality of products. Biedenbach and Müller (2012) use pharmaceutical and biotechnology organizations as an example and find that there is a significant relationship between inter-organizational learning capability and organizational performance in both short-term and long-term projects. Applying the example of e-business service provision, Daniel and Wilson (2003) find that the capability of integrating e-business processes into existing activities enables government agencies to successfully provide the service. Knowledge integration can also help small and medium-sized environmental organizations to better scrutinize their operational deficiencies and help them to finally improve their overall performance (Machado et al., 2020; Zahoor & Gerged, 2021).

However, there may be competition within the four types of dynamic capabilities, especially considering the limited resources of small disaster relief nonprofit organizations. Cultivating and maintaining dynamic capabilities may exceed organizational available resources (Winter, 2003; Zahra & George, 2002). For instance, paying attention to sensing new opportunities from partners may impede leaders'

available time and energy to develop integrating capabilities in communicating with staff, volunteers, and employees. In addition, since the performance of disaster relief nonprofit organizations includes multiple dimensions, ranging from service provision to social capital cultivation, different perspectives of performance may require various types of dynamic capabilities.

Dynamic Capabilities and Service Provision. An effective service provision in a disaster setting, especially in the aftermath of disasters, requires organizations to have the capability of sensing available resources in order to address the increasing needs. However, the most convenient way for disaster relief managers to seek potential resources is not through developing new connections with strange organizations but by relying on pre-disaster connections. As previous literature has shown, maintaining pre-disaster relationships facilitates the response after a disaster (Kapucu, Yuldashev, & Feldheim, 2011; Doerfel et al., 2013). Thus, instead of applying the sensing capability to target new partners and resources in a disaster setting, the strategy of adjusting to the environment may depend on previous collaborations. Thus, sensing capability may not directly relate to the performance of disaster relief service provision. While learning capability guides the practice of “revamping existing operational capacities with new knowledge” (Pavlou & El Sawy, 2011, p.244), it helps disaster relief nonprofits to gain and assimilate the changing information about unmet needs and use the current resources to apply the new knowledge into the practice, which can significantly improve service provision (da Costa et al., 2020). Integrating capability represents the effectiveness of organizational behaviors in transferring knowledge from the individual level to the organizational level (Pavlou & El Sawy, 2011), especially to volunteers who are

deployed by disaster relief nonprofits to provide direct service. A higher level of integrating capability can help disaster relief nonprofits effectively manage volunteers and staff in the process of service provision. Coordinating capability is the capability of allocating resources to implement the change. A strong coordinating capability can help move the adaptation forward, resulting in better service provision. Thus, I posit,

Hypothesis 1a: There is a positive relationship between learning capability and service provision of disaster relief nonprofits.

Hypothesis 1b: There is a positive relationship between integrating capability and service provision of disaster relief nonprofits.

Hypothesis 1c: There is a positive relationship between coordinating capability and service provision of disaster relief nonprofits.

Dynamic Capabilities and Public Policy Engagement. Regarding the performance of public policy engagement, nonprofit organizations serve citizens as an opportunity to come together in pursuit of community goals (Putnam, 2000; Smith, 2001). They play an essential role in connecting citizens to government and achieving “public purpose [and] voice their concerns to government” (Boris, 1999, p. 4). Sensing the opportunity to collaborate with government is a common practice for disaster relief nonprofit organizations since government provides multiple funding for service provision, especially in president-declared disasters (Simo & Bies, 2007). A higher level of sensing capability can help these organizations target the opportunity of collaborating with government, which can enhance the relationship and get more chances for public policy engagement. Learning capability enables organizations to observe unmet community needs and collect the opinions of local residents. Being exposed to current

policy limitations may motivate disaster relief nonprofits to engage more in the public policy process to address the issues. There are three types of nonprofit-government ties, including political ties, service organization ties, or personal ties, that are generally handled by organizational leaders (Zhan & Tang, 2016) and opens the window for nonprofits' public policy engagement. The integrating capability of communicating with volunteers and staff may not influence the performance of public policy engagement since organizational leaders take the primary responsibility of developing and maintaining such ties. The coordinating capability of distributing resources also has a limited impact on public policy engagement because disaster relief nonprofits do not take primary responsibility for making decisions and implementing public policy change. Their capability of implementing adaptations may not directly contribute to their public policy engagement. In contrast, considering the limited resources within nonprofits, a higher level of coordinating capability can even impede the capability of sensing and learning in capturing new engagement opportunities and collecting valuable feedback from the community. Thus, I posit (also see Table 2),

Hypothesis 2a: There is a positive relationship between sensing capability and public policy engagement of disaster relief nonprofits.

Hypothesis 2b: There is a positive relationship between learning capability and public policy engagement of disaster relief nonprofits.

Hypothesis 2c: There is a negative relationship between integrating capability and public policy engagement of disaster relief nonprofits.

Hypothesis 2d: There is a negative relationship between coordinating capability and public policy engagement of disaster relief nonprofits.

Dynamic Capabilities and Community Social Capital Cultivation. The performance of community social capital cultivation reflects the behaviors of disaster relief nonprofit organizations in educating the local community, strengthening community collaboration, and encouraging the prosocial behavior of community members. To achieve this mission, disaster relief nonprofit organizations need to engage in the community, update their approaches to collaborating with other community partners based on the feedback, and make adaptations to their service provision. The sensing capability, which focuses on finding new fields and extending the service in different places, may not significantly influence social capital cultivation in a disaster setting. Because being embedded in a community and providing community-based service is the advantage of disaster relief nonprofit organizations (Demiroz & Hu, 2014), many organizations have even been in the community for many years. The main focus for them is to maintain the existing engagement and relationship rather than seeking new opportunities for community engagement or extending their service to other communities. However, continuing to learn from the community to make adaptations for their tools and approaches to providing services is helpful for maintaining the relationship. Also, social capital cultivation relies on the connection between disaster relief nonprofits and the served community. The interaction within the organization may matter for their service provision but would show a limited direct impact on social capital cultivation. Therefore, integrating and coordinating capabilities, both focus on internal communication and decision-making, may not directly influence the involvement in communities. Thus, I posit,

Hypothesis 3: The learning capability of disaster relief nonprofits positively impacts their performance in community social capital cultivation.

Other factors, including organizational features and the external environment, can impact the relationship between dynamic capabilities and the performance of disaster relief nonprofit organizations. Existing literature shows that leadership style shapes the work environment and employee's attitudes toward the organization. Nonprofit leaders who help members feel included improve the emotional attachment of employees to the organization (Mor Barak et al., 2016; Sarros, Cooper & Santora, 2008) and ultimately enhance organizational performance. Organizational size and age are also important factors in affecting the performance of nonprofit organizations. Different sizes and the existing years of the organization reflect the available resources (Hager, Galaskiewicz, & Larson, 2004; Guo & Acar, 2005) to promote their service provision, public policy engagement, and social capital cultivation. Besides internal factors, the external environment also matters based on previous studies. Dynamic capabilities are more valuable for organizations that experience a higher level of uncertainty (Piening, 2013). Additionally, to reduce environmental uncertainty and mitigate information asymmetry, disaster relief nonprofits may seek to connect with government and promote public policy engagement (Meier & O'Toole, 2003). Network engagement also impacts the stability of external environments and the potential resources of nonprofit organizations to maintain their performance (Guo & Acar, 2005).

Table 2 Hypothesis between Dynamic Capabilities and Organizational Level Performance

DCs	Public Value Achievement			References
	Service provision	Public Policy Engagement	Social Capital Cultivation	
Sensing		+		Doerfel et al., 2013; Simo & Bies, 2007; Demiroz & Hu, 2014
Learning	+	+	+	da Costa et al., 2020; Chan & Tang, 2016
Integrating	+	-		Pavlou & El Sawy, 2011
Coordinating	+	-		Winter, 2003; Zahra & George, 2002

Dynamic Capabilities and Network Benefits

The neo-institutional theory, which aims to answer the question “What makes organizations so similar” (DiMaggio & Powell, 1983: 147), implies the potential relationship between organizational dynamic capabilities and network engagement. From the perspective of neo-institutional theory, an organization that is considerably different from the majority of existing organizations in the niche will lead to distrust from funders, recipients, and other stakeholders. It is hard to gain constitutive legitimacy to continue growth (Hannan & Carroll 1992). Ferrin and coauthors (2006) find that structural equivalence significantly impacts the success of trust-building in cooperation since the similarity in organizational structure motivates the participants to develop similar attitudes and beliefs. Homophily, especially cultural and organizational similarity, can impact the performance of partnership and collaboration because it is associated with better communication, coordination, and consensus on mutual aims and values (Austin & Seitanidi, 2012). Chen and Graddy (2010) also find that shared vision can enhance inter-organizational relationships. Collaborators with good relationships are more likely to

enhance the success of the partnership and also have a higher level of satisfaction towards the network (i.e., Dyer & Chu 2003; Mohr & Spekman 1994; Zaheer et al. 1998).

Moynihan (2009) also emphasizes that how well the Incident Command System functions relies on the prior working relationships among the key participants.

Thus, making connections and showing similarities with members in the network is an important approach for disaster relief nonprofits to be embedded in the network and get benefits. The coercive pressure, mimetic factors, and normative factors from the environment also imply the importance of organizational learning in developing a trustworthy relationship and achieving satisfactory outcomes within the network.

Coercive pressure is the “formal and informal pressures exerted on organizations by other organizations upon which they are dependent and by cultural expectations in the society within which organizations function” (DiMaggio & Powell, 1983: 150). The pressure from the legal system and the critical resource holders in the network can encourage organizations to make adaptations with the aim of being better embedded in the network and getting benefits. Mimetic factors also push organizational change and isomorphism. Organizations choose to mimic a few successful entities either because large organizations in the field adapt to the change or large numbers of organizations do the same thing. Normative factors, such as professionalization, are associated with organizational change and homogenization because the recruitment of similarly trained specialists and the growth of professional networks will increase the resemblance of organizational practice (Heugens & Lander, 2007).

To summarize, the neo-institutional theory implies that organizations capable of adapting and learning from other organizations are more likely to establish positive

relationships in the network and acquire valuable resources for organizational development. Dynamic capabilities, as the catalyst between environmental change and organizational internal ability (Pablo et al., 2007), can contribute to organizational network engagement and acquired benefits by bridging the gap with other network members, fostering trust, and securing valuable resources.

The fundamental component of networks is to share and exchange ideas, information, and knowledge (Monge & Contractor, 2003). The inter-organizational network serves as a learning opportunity for member organizations since it facilitates the diffusion of ideas (Kapucu et al., 2010; Maroulis, 2017). Sensing capability allows disaster relief nonprofits to recognize the potential new opportunities to be involved in a network and develop their relationships with other organizations. Also, Kong and Farrell (2010) indicate that there is a significant association between learning capabilities and external relationship development, such as the relationship with partners, government, and clients. After participating in the network, whether members can get benefits from the network or not highly relies on the learning capability of these individual organizations (Carley & Harrald, 1997). Thus, taking the VOAD/COAD network as an example, I posit (see Table 3 for a summary),

Hypothesis 4a: VOAD/COAD members are associated with a higher level of sensing capability.

Hypothesis 4b: VOAD/COAD members are associated with a higher level of learning capability.

Hypothesis 4c: Disaster relief nonprofit organizations with a higher level of learning capability can get more volunteer support from the VOAD/COAD network.

Hypothesis 4d: Disaster relief nonprofit organizations with a higher level of learning capability are able to use financial opportunities provided by the VOAD/COAD network.

Hypothesis 4e: Disaster relief nonprofit organizations with a higher level of learning capability can increase their reputation by participating in the VOAD/COAD network.

Hypothesis 4f: Learning capability can promote the total benefits member organizations acquired from the VOAD/COAD network.

Table 3 Hypothesis between Dynamic Capabilities and Network Level Performance

DCs	Nonprofit Performance: at the Network Level					References
	Network Engagement	Volunteer Support	Financial Opportunities	Reputation Improvement	Total benefits	
Sensing	+					Monge & Contractor, 2003; Maroulis, 2017
Learning	+	+	+	+	+	Kong & Farrell, 2010; Carley & Harrald, 1997

Whether disaster relief nonprofit organizations can acquire benefits from the VOAD/COAD network is not only impacted by dynamic capabilities. Network capability and the embedded level of the members are also influential. The structure and capability of the network influence network capability in providing benefits to its members. Valero and Jang (2020) use a local homeless service network as an example and suggest the frequency of interaction and the attendance rate of formal meetings reflect network capability and the communication level among network members, which finally influence

network performance. Besides network capability, the embeddedness of individual organizations also affects the gained benefits. Research shows that network embeddedness promotes organizational knowledge acquisition (Zheng et al., 2011). Additionally, whether engaging in the state-VOAD or local COAD is recorded and included in the analysis. Although VOAD and COAD show strong similarities and overlaps in their membership list, this variable still partly reflects the size of the network and the community engagement level.

Other factors, such as the size of nonprofit organizations and their age are also included. These variables are associated with different levels of resource availability, especially from the financial perspective, which shapes their network engagement and performance at the network level (Hager, Galaskiewicz, & Larson, 2004; Guo & Acar, 2005). Larger organizations have more resources to cover the cost of inter-organizational networking and collaboration. They are also more likely to occupy the central position and take benefits (Foster & Meinhard, 2002; Graddy & Chen, 2006).

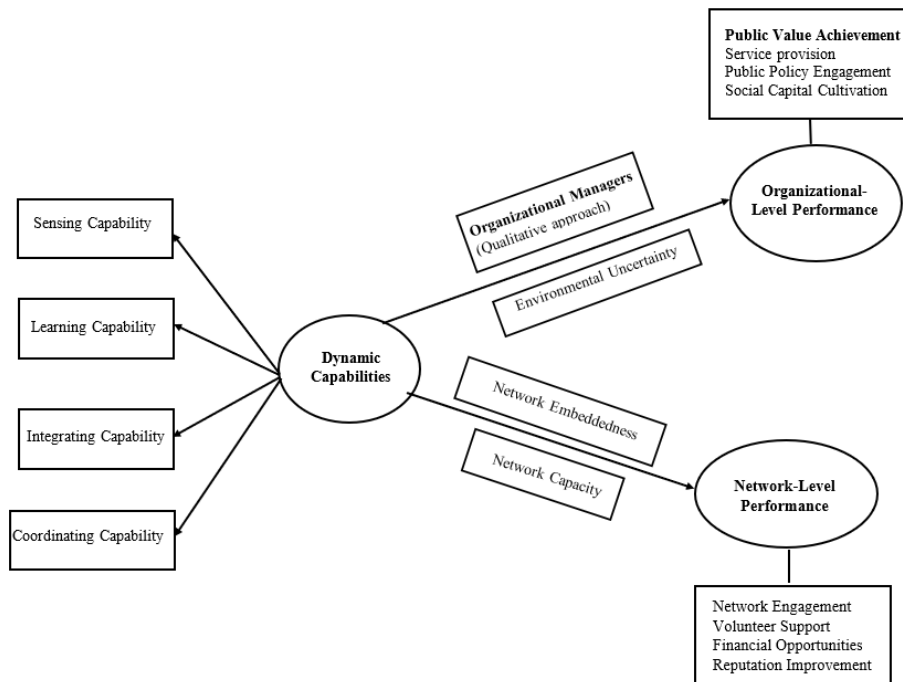
Conclusion

Existing literature points out the importance of disaster relief nonprofit organizations and explores the adaptations of nonprofit organizations and the motivations for adaptations. However, limited discussions have targeted disaster relief nonprofit organizations, aiming to understand the process of adaptations of these organizations, the capabilities that support these organizations for successful adaptations, and the association between the capabilities and these nonprofits' performance. Applying the theory of dynamic capabilities, this research proposes various hypotheses regarding the performance of disaster relief nonprofits at both the organizational and network levels

while emphasizing the nuanced impact of sensing, learning, integrating, and coordinating capabilities on the performance of disaster relief nonprofit organizations.

Based on the discussion about the adaptation of disaster relief nonprofit organizations, the theory of dynamic capabilities, and the association between dynamic capabilities and performance, the theoretical framework of this research is as follows (see Figure 2).

Figure 2. Conceptual Framework Overview



CHAPTER 4

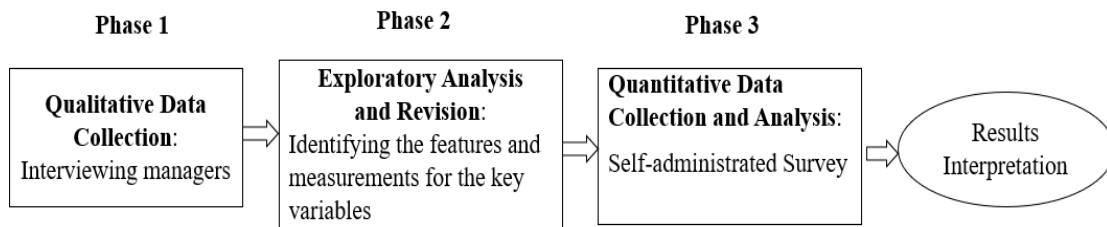
DATA AND ANALYTICAL METHODS

In order to explore the adaptation process of disaster relief nonprofit organizations and examine the influence of dynamic capabilities on performance at both organizational and network levels, mixed methods are employed in this research. Disaster relief nonprofit organizations in Arizona, Florida, and New Jersey were selected as research samples after considering geographic location, disaster frequency, and disaster cost in the past 40 years (NOAA, 2021). The differences regarding the role of disaster relief nonprofit organizations in state emergency management plans, listed in Chapter 2, also provide justifications for selecting these three states. In-depth interviews and an online survey were conducted for data collection.

As mentioned, mixed methods, which “involves combining or integration of qualitative and quantitative research and data in a research study” (Creswell & Creswell, 2018, p. 14) is applied in data collection and analysis because it shows advantage in providing a comprehensive understanding about the adaptations of disaster relief nonprofit organizations and developing better measurements by first collecting qualitative data before administrating the questionnaire. There are three approaches utilizing mixed methods for research design, including convergent design, explanatory sequential design, and exploratory sequential design (Creswell & Creswell, 2018). Considering the limited understanding of adaptations in disaster relief nonprofit organizations and dynamic capabilities, this research uses a three-stage exploratory sequential design, which starts with qualitative data collection, specifically through interviewing disaster relief nonprofit managers in this study, to explore the research topic

of adaptations. After having the general picture of the adaptations, capabilities, and network engagement of disaster relief nonprofit organizations, the second phase is to develop instruments and measurements. The third phase is to administer and test the associations between dynamic capabilities and the performance of disaster relief nonprofits at both the organizational and network levels (see Figure 3).

Figure 3. The Mixed Methods Design for the Research



Reference: Creswell & Creswell (2018)

Sampling Methods

Interview

To target active disaster relief nonprofit organizations in each state for in-depth interviews, I first contacted and interviewed the board members and chairs of VOADs in each state through email. As mentioned in Chapter 2, VOADs play an essential role in promoting communication, coordination, and collaboration of disaster relief nonprofit organizations. The overlapping between the VOAD members and local COAD members also enables the research to cover local-based nonprofit organizations. VOAD Board members typically consist of active membership organizations that voluntarily support the network operation. Twenty-three invitations were sent to the board members and the chair/executive director of VOADs with 2 reminders. There were 6 board members, and 3 VOADs' chairs/executive directors accepted the invitation. Using snowball sampling,

each interviewee was asked to recommend active nonprofit organizations in their community (both VOAD members and non-members) and their collaborators, if any, in the other two states. Data collection continued until the achievement of theoretical saturation, which implies that additional data did not significantly contribute to code development (Glaser & Strauss, 1967).

The two rounds yielded 31 organizations. A semi-structured interview protocol was developed (see APPENDIX A) to ask each interviewee about adaptation cases in their organization, the process of conducting the adaptation, and the strategies and approaches to address barriers in the process. The interviews were conducted via Zoom and audio-recorded with the interviewees' permission. Each of them lasted around 60 minutes.

Survey

The relationships between dynamic capabilities and the performance of disaster relief nonprofits were investigated mainly using survey data. The sampling process included multiple steps (see Figure 4). Collecting the members of the VOAD/COAD network is the first step since this network acts as a single connection point between government and nonprofit organizations in the aftermath of a disaster (The Center for Disaster Philanthropy, 2022). Additionally, this research aims to explore the relationship between organizational dynamic capabilities and the gained benefits of individual organizations from the VOAD/COAD network. Thus, it is necessary to include its member organizations in the three states. Considering the different levels of VOAD, the sample of VOAD/COAD members in this survey includes 1) the local chapter of NVOAD members in Arizona, Florida, and New Jersey, 2) the state VOAD members,

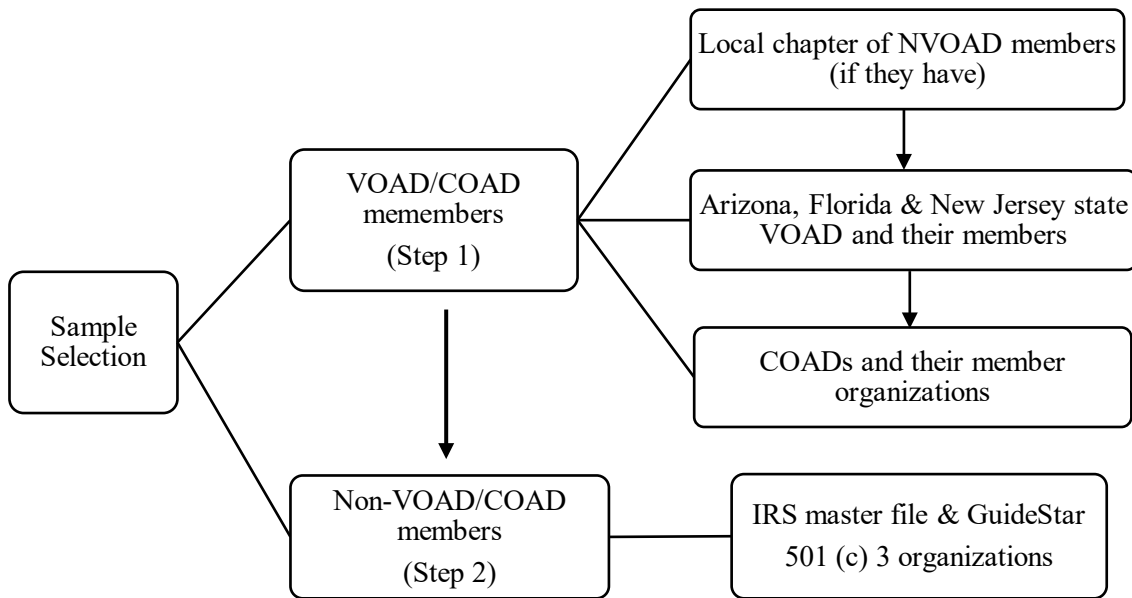
and 3) the COAD members. The membership lists of NVOADs, three state VOADs, and 6 COADs (2 in Arizona, 3 in Florida, and 1 in New Jersey) are available in this study. Addressing duplicates of the VOAD/COAD members is the next step since the available membership list of the VOAD/COAD network shows overlaps. After checking the duplication, 896 VOAD/COAD members were included in the study.

The second part of the survey is non-VOAD/COAD disaster relief nonprofit organizations. The approach to select samples for non-VOAD/COAD members was first using GuideStar to obtain the list of nonprofit organizations categorized as “Disasters and Emergency Management” by GuideStar. As a database that is commonly used in the nonprofit sector to select samples (i.e., Burks, 2015; Lee, 2022), GuideStar shows its advantage in narrowing down the search by multiple criteria. Using the two search criteria of state and type, a list of 1,422 nonprofit organizations that were located in Arizona, Florida, and New Jersey and focused on disaster and emergency management was generated.

The original IRS Exempt Organizations Business Master File is the third resource to select the sample of disaster relief nonprofit organizations. Although Guidestar is based on the IRS master file, the original data provided by the IRS is more updated, which can provide more accurate information about the active/inactive status of nonprofit organizations. Additionally, disaster relief nonprofits show their uniqueness since many nonprofit organizations provide support after a disaster or regard disaster relief as part of their mission, but they also provide general mass care service in non-disaster settings. For these organizations, they may not report themselves or be categorized as “disaster and emergency management” organizations in GuideStar. Thus, using the original IRS Master

File and National Taxonomy of Exempt Entities (NTEE) codes to recognize potential disaster relief nonprofit organizations that are not included in the GuideStar is necessary. Twenty-four disaster relief-related NTEE codes are selected (See APPENDIX B), such as environmental education, animal protection & welfare, mental health treatment, emergency medical services & transport, and food banks & pantries, to include the potential disaster relief nonprofit organizations. After deleting the duplication between GuideStar and the selected IRS data, the total number of these organizations is 12,021. I used stratified random sampling, based on the location and the NTEE code of the nonprofits, to select 10% of these organizations, which yielded 1202 nonprofit organizations.

Figure 4. The Sampling Procedure



To distribute the questionnaire through emails, the email addresses of the sample organizations were collected through VOAD/COAD membership lists and organizational websites. About two-thirds of these organizations, specifically 668 VOAD/COAD

members, 930 organizations from the GuideStar list, and 714 organizations from the IRS dataset, have available email addresses. The number was reduced again when sending out the response invitation using Qualtrics. There are 598 VOAD/COAD members, 810 disaster relief nonprofit organizations based on the GuideStar list, and 616 non-VOAD/COAD members from the IRS list that have successfully received the email.

All respondents were recruited through email except 1 of them (see APPENDIX C), who was recruited through the in-person Arizona VOAD annual general meeting held on January 10, 2023. A self-administered questionnaire was developed through multi-step approaches following the guidance from Creswell (2018). Firstly, the review of previous research related to dynamic capabilities and nonprofit performance provided the theoretical framework for the survey. Furthermore, modifications were implemented using the interview materials and feedback from a peer review involving scholars and practitioners. A pilot survey was conducted to enhance the reliability and validity of the survey, involving 5 respondents with experience in both nonprofit organizations and disaster management backgrounds. The survey took around 15 minutes to finish. In order to encourage the participants to respond to the survey, successful respondents can voluntarily enter into a gift card drawing for a \$20 gift card with 30 cards in total.

The web-based survey was administered at three time points through Qualtrics (see APPENDIX D). The first invitation was sent out on September 23, 2022, followed by two reminders to all respondents on October 11, 2022, and November 17, 2022. In the meantime, the targeted emails have been sent out to improve the response rate. The data collection ended on February 13, 2023 (considering the influence of Hurricane Ian, the close date is postponed for the aim of increasing the response rate). There are 110

organizations responding to the survey, including 31 organizations either indicating that they do not provide disaster relief service or ending the survey by answering less than 50% of the listed questions. Finally, 79 organizations successfully finished the survey. The response rate is 5.43%.

Data and Sample Size

Interviews

As mentioned, there are 31 organizations that accept the interview invitation, among which 12 organizations locate and provide service mainly in Arizona, 7 of them are New Jersey-based, and the other 12 nonprofits are from Florida. Most interviewees (61.29%) are nonprofit chairs/executive directors, 9 of them are program directors, and the remaining 3 are the program coordinators making connections between their organization and the VOAD/COAD network (see Table 4).

All the audio records were transcribed and analyzed using MAXQDA. Thematic analysis, which involves analyzing, identifying, and presenting patterns of data (Boyatzis, 1998), was applied to explore the transcribed data. Both deductive and inductive approaches were used to develop the codebook, which allows researchers to use a theory-led approach to explore the original themes while remaining open to emerging ideas (Braun & Clarke, 2006). Specifically, four key themes, the service provision of disaster relief nonprofits, the adaptations, the procedures of disaster relief nonprofit organizations, and the benefits of engaging in the VOAD/COAD network, have been coded based on the research topic and interview protocols.

Finally, with 687 references in total, nine codes are developed to capture the role of disaster relief nonprofits in emergency management. The adaptations of disaster relief

nonprofit organizations are associated with 4 codes, including internal management change, innovation in service provision, service extensions, and the adaptation in collaborations. The adaptation procedure of disaster relief nonprofit organizations yields 5 codes associated with 14 subcodes. And there are another 3 codes that cover the perspectives about the function of the VOAD/COAD network. The specific codebook for different themes will be shown in the following sessions corresponding to the analysis.

Table 4. Gender, Position, and Working Years of the Interviewees

Interviewee	Gender	Position	Working Years
Interviewee 1	Female	Vice President	7 years
Interviewee 2	Female	Vice President	7 years
Interviewee 3	Female	Chair	3 years
Interviewee 4	Female	Director of Disaster Relief	14 years
Interviewee 5	Female	Administrator	6 years
Interviewee 6	Male	Chief Executive Officer	20 years
Interviewee 7	Female	Chair	18 years
Interviewee 8	Female	Vice president	21 years
Interviewee 9	Male	Director of Operations	12 years
Interviewee 10	Female	Chair	6 years
Interviewee 11	Male	Lead	3 years
Interviewee 12	Female	Executive Director	8 years
Interviewee 13	Female	Founder & Executive Director	6 years
Interviewee 14	Male	Executive Director	8 years
Interviewee 15	Male	Director of Disaster Relief	6 years
Interviewee 16	Female	Chief Executive Officer	10 years
Interviewee 17	Female	Program Leader	2 years
Interviewee 18	Male	Director of Emergency Disaster Services	6 years
Interviewee 19	Male	Chief Program Officer	5 years
Interviewee 20	Female	Executive Director	15 years
Interviewee 21	Male	Chair	3 years
Interviewee 22	Female	Executive Director	4 years
Interviewee 23	Male	Director of Disaster Relief	13 years
Interviewee 24	Male	Disaster Preparedness and Relief Manager	3 years
Interviewee 25	Male	Director of Disaster Services	2 years

Interviewee	Gender	Position	Working Years
Interviewee 26	Female	Disaster Response Coordinator	4 years
Interviewee 27	Female	Executive Director	5 years
Interviewee 28	Female	Board Member	2 years
Interviewee 29	Male	President/Co-Founder	31 years
Interviewee 30	Male	Emergency Management Specialist	10 years
Interviewee 31	Female	Executive Director	3 years

Survey

A descriptive analysis regarding the roles and adaptations of disaster relief nonprofit organizations has been conducted using 79 samples before analyzing the association between dynamic capabilities and the performance of disaster relief nonprofits at both the organizational (Questions 2) and network (Questions 3) levels. Regarding Question 2, after deleting cases with more than 30% missing key variables, 71 organizations are included in the analysis. Multiple imputations are applied to address missing values via Mplus (Version 8).

The analysis for Question 3 about network engagement and the corresponding benefits among the VOAD/COAD members involves both the interview and survey data. The brief exploration regarding the variation of dynamic capabilities between VOAD/COAD members and non-members includes all 79 respondents. The comparison is conducted with missing values through SPSS. Then, targeting the VOAD/COAD members, the 31 interviews from the VOAD/COAD managers are first used to clarify the types of benefits that the VOAD/COAD network provides to member organizations. Among the 79 samples, there are 17 VOAD members and 11 COAD members, while another 22 are both VOAD and COAD members. Twenty-three respondents are non-VOAD/COAD members, and 6 organizations do not respond to the question. For the 22

organizations who answered the questions about the acquired benefits from the VOAD and the COAD networks, respectively, each organization accounts for 2 records to represent either a VOAD member or a COAD member. The VOAD/COAD variable is also created to capture whether they respond as a VOAD member or a COAD member. The multiple imputation is applied to address missing values using Mplus (Version 8) after deleting the records with more than 30% losses in key variables. The sample size for the third research question is 66.

Overview: Roles and Adaptations of Disaster Relief Nonprofits

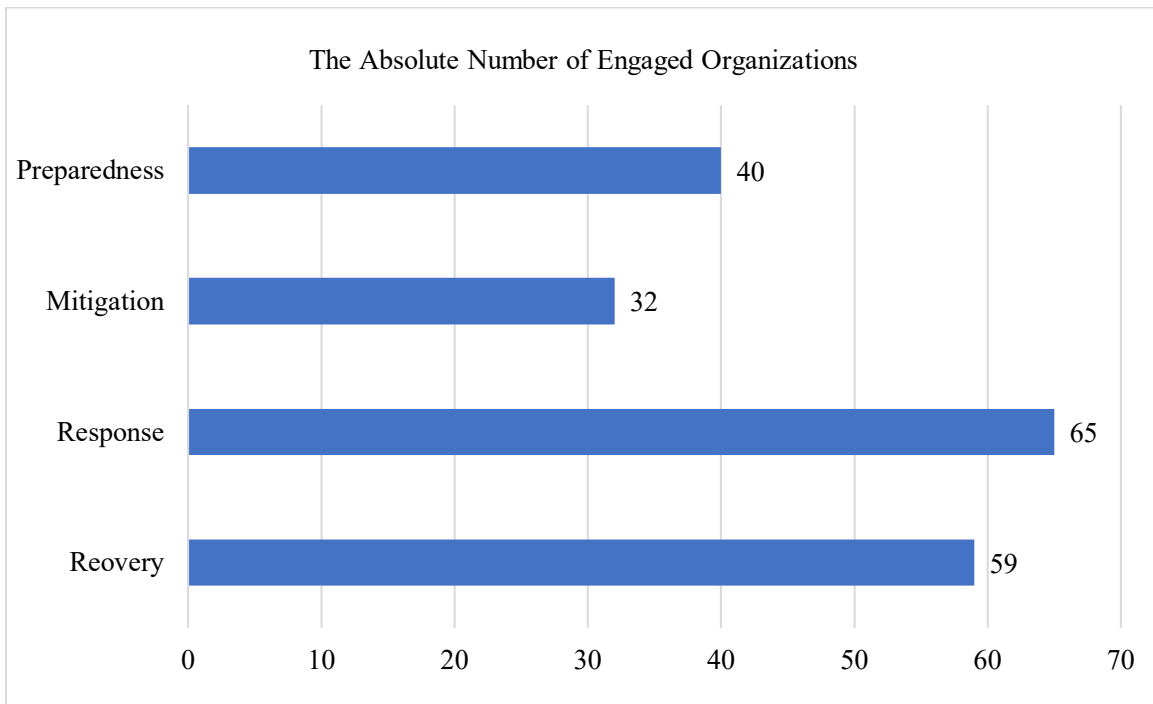
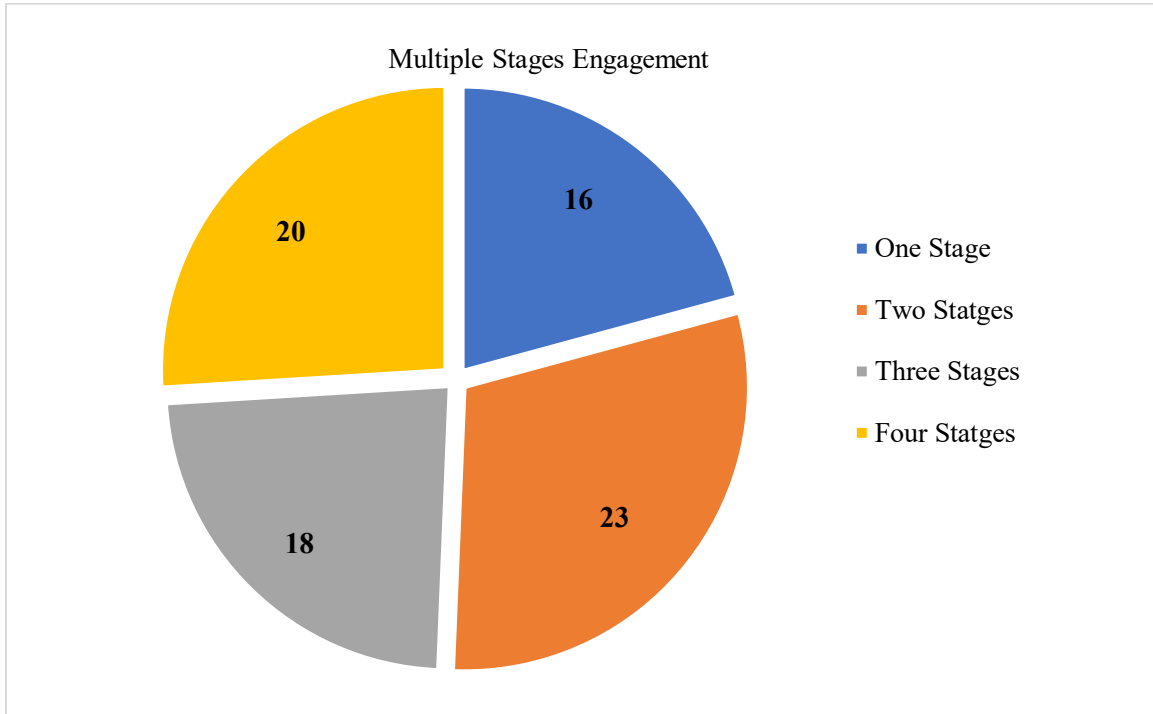
Before exploring the three key research questions about the procedures of adaptations and the influence of dynamic capabilities on organizational performance, a general descriptive analysis of the interview and survey data is conducted to provide an overview of the role of disaster relief nonprofit organizations in emergency management and the adaptations that these nonprofits have taken in the past years.

Nonprofit Engagement in Emergency Management Phases

Following the four stages of emergency management, including disaster preparedness, mitigation, response, and recovery, the survey respondents were asked to categorize their services and identify which stages they have been engaged in. Among the 79 respondents (except 2 organizations with missing value), 16 of them indicate that their organizations are involved in only one stage of emergency management, while around 80% of responded organizations provide services in multiple stages, and about one-fourth (23) of organizations engage in all four stages (see Figure 5). Additionally, sixty-five and 59 organizations indicate that they participate in disaster response and recovery,

respectively. Thirty-two organizations report an engagement in disaster mitigation, and 40 respondents are active in preparedness.

Figure 5. The Engaged Stages of Disaster Relief Nonprofit Organizations



Service Provision of Disaster Relief Nonprofits

The interviewees were asked to report disaster relief services their organizations can provide. These services include community organizing, volunteer and donation management, animal and livestock care, community preparedness, coordination, childcare, transportation, case management, distribution of essential resources, mass feeding and food service, first-responder care, logistic management, information and referral services, family reunion and survivor services, sheltering, first aid and health service, mental health care, financial support, and housing repair and debris clean-up. Since only limited organizations report first-responder care, and case management is associated with specific types of service provision, such as information and referral services and housing repair, these two types of services were not listed when designing the survey questions.

More information about the service provision of disaster relief nonprofit organizations is provided based on the question “*What are the disaster relief services your organization typically provides?*” in the survey. Seventeen common disaster relief services, such as the distribution of essential resources, mass feeding services, donation management, housing repair, and transportation support, based on the interview, are listed. Forty nonprofits out of 79 are involved in the distribution of essential resources (packed food, water, clothing, etc.), and 27 respondents report their engagement in volunteer management. Besides the 17 types of disaster relief services, collaboration, search and rescue, advocacy, communication, legal service, and training are listed by the respondents with the specific option “others.”

Using the Emergency Support Function provided by FEMA (2019), the 23 disaster relief services in the survey matches 7 ESFs, including ESF #1 Transportation, ESF #2 Communication, ESF #5 Information and Planning, ESF #6 Mass Care, emergency assistance, temporary housing, and human services, ESF #7 Logistics, ESF #8 Public Health and Medical Services, and ESF #9 Search and Rescue. Pre-disaster education and training and right protection are another 2 categories that are not included in ESFs but have been reported by respondents. The number of organizations providing each type of service in each state is listed in Table 5.

The same as the Emergency Operational Plans provided by the states of Arizona, Florida, and New Jersey, which have been mentioned in Chapter 2, more than 80% of disaster relief nonprofit organizations in each state are involved in mass care, emergency assistance, temporary housing, and human services. The specific mass care services they have provided include at least the following 13 types: Distribution of essential resources (packed food, water, clothing, etc.), mass feeding services (meal preparedness, food delivery, etc.), emergency sheltering, donation management & distribution, financial assistance (cash assistance, financial counseling, etc.), debris removal and housing clean-up (or providing supplies for clean-up), housing repair, rebuilding, and retrofitting, family reunion and other survivor services, emotional and spiritual care, mental health services, volunteer management and support services, disability assistance services, and animal care and support services. Information and planning, which includes all the stakeholders in the plans, is the second major function that disaster relief nonprofits have supported.

The functions that disaster relief nonprofit organizations are able to support also show variations among states (see Table 5). For instance, there is a higher percentage of disaster relief nonprofit organizations engaging in search and rescue (11.11%) in New Jersey compared with nonprofits in Arizona and Florida. In addition, five nonprofits out of 18 in New Jersey report their attention on pre-disaster education and training, and nonprofits are also actively involved in advocacy and legal consulting for disaster survivors. Disaster relief nonprofit organizations in Florida and Arizona show similarities in their engagement in logistics and communication. Nonprofit organizations with expertise in radio communication provide support with urgent communications during and after a disaster.

Table 5. The Service Provision of Disaster Relief Nonprofit Organizations

ESF	Services (Listed in the questionnaire)	Arizona (n=24) % (n)	Florida (n=33) % (n)	New Jersey (n=18) % (n)
#1 Transportation	Transportation support	8.33 (2)	12.12 (4)	16.67 (3)
#2 Communication	Communication	8.33 (2)	3.03 (1)	0 (0)
#5 Information and Planning	Information and referral services	33.33 (8)	30.30 (10)	50 (9)
#6 Mass Care, Emergency Assistance, Temporary Housing, and Human Services	Distribution of essential resources (packed food, water, clothing, etc.)	87.5 (21)	87.88 (29)	83.33 (15)
	Mass feeding services (meal preparedness, food delivery, etc.)			
	Emergency sheltering			
	Donation management & distribution			
	Financial assistance (cash assistance, financial counseling, etc.)			
	Debris removal and housing clean-up (or providing supplies for clean-up)			
	Housing repair, rebuilding, and retrofitting			
	Family reunion and other survivor services			
	Emotional and spiritual care			
	Mental health services			
Volunteer management and support services				
Disability assistance services				
Animal care and support services				
#7 Logistics	Coordination and collaboration	4.17 (1)	18.18 (6)	0 (0)
#8 Public Health and Medical Services	First aid or emergency medical/lifesaving assistance services	20.83 (5)	6.06 (2)	27.78 (5)
	Search and rescue	4.17 (1)	3.03 (1)	11.11 (2)
Pre-disaster education and training	Environmental education	8.33 (2)	6.06 (2)	27.78 (5)
	Training and preparedness			
Right protection	Advocacy & Legal service	0 (0)	0 (0)	11.11 (2)

Note: Among the 79 respondents, there are 4 organizations with missing on state variable, while there are 2 respondents (1 in Arizona, 1 in New Jersey) that do not answer the question. Additionally, since many disaster relief nonprofit organizations provide multiple types of services, the total percentage of respondents within each state is higher than 100%.

Organizational Adaptations of Disaster Relief Nonprofits

The interviewees mentioned multiple adaptations that disaster relief nonprofit organizations have made. Four codes, including internal management change, innovation in service provision, service extension, and the adaptation in collaborations, are emerging with 139 references in total.

Internal management change describes the efforts in human resource management and logistics management to adjust to the environment. Multiple interviewees mentioned their adaptations related to volunteer management. One of them said,

Before COVID, we would have volunteer teams come from another state, they drive in vans or cars and come, and they would stay at a church with 10 beds in a room. And, you know, we can't do that with COVID. We had to close our volunteer facilities. So, we came up with a program called Commuter Volunteers. And what that was we get people to sign up individuals, from local in [Anonymized State], and we would deploy them to help in a disaster..., but you would drive there, you would bring everything you need..., but then you drive home, at the end of the day, you're not staying anywhere (Interview 20, Pos. 126).

The logistic adaptations are primarily about warehouse management. For example, one of the interviewees mentioned,

What [Anonymized Affiliation] started six years ago, in Atlanta, we're basically a spin-off of [Anonymized Organization], where we would deploy out and respond to disasters. Like I said before, a subset of what [Anonymized Organization] is, as far as in gray sky type. And then, as we've grown, [Anonymized County] was kind of one of the first actual [Anonymized Affiliation] warehouses that we stood

up kind of as a test pilot if you will. So, we stood it up. And we were able to do it effectively and efficiently. So, we most recently replicated that in [Anonymized City] ... and we're looking at replicating in [Anonymized City] and potentially moving out west into the [Anonymized state] area. (Interview 25, Pos. 40)

Innovation in service provision includes both the service model change and the application of new technology. One of the interviewees mentioned that a new service provision mode is utilized to adjust to the policy change during the COVID-19 pandemic. She said,

We have a good example of that during the pandemic. We had to adapt how we provided client casework after a house fire. For example, again, we do two or three those a day, sadly, ... (but during COVID), we can't do it that way right now, we have to do it remotely. We can go to the fire and be there. But we're not going to go within six feet of this client. We're going to tell them we're gonna have the fire department and tell them how to get a hold of the [Anonymized Organization], they're going to contact the [Anonymized Organization]. And we're going to provide an EFT transaction, a financial transaction that winds up in their account. (Interview 16, Pos. 81)

Because of social distance policy, digitalizing service provision is a common practice among the interviewees,

Now we change a lot of our policies and procedures...let's say you were affected by a disaster, well, instead of you and I meeting face to face, now I will go through the interview process. I interview you, and you show me your identification and stuff like that, and then through one of the APPs, I say, OK, I'm

going to give you \$25 in gift cards or some other financial or award. And that gets transferred to your smartphone. So, then you can take that and go to a Walmart or whatever and purchase the necessary items (Interview 19, Pos. 27).”

The development of technology and its convenience also motivate managers to apply it in service provision. One of the managers mentioned,

The technology that we have today, we didn't have before. Let's say 20 years ago, if there was a wildfire in New Mexico, a big one, we would wait until the fires over, which might be three weeks, four weeks later, we'd finally be able to get into the area. And we would drive [Anonymized Organization] cars into the area and pick out which homes had been destroyed or damaged... Today... we're using satellite imagery, so that I literally I'm on calls in the morning, every morning, where we are looking down on the areas that have been burned, we can see the house destroyed in so we can provide, you know, all this kind of assistance almost immediately (Interview 6, Pos. 54).

Involved in different phases of disaster management and geographically extending service provision to other communities are other adaptations that disaster relief nonprofit organizations have made in the past years. An interviewee mentioned that,

In the past, the focus, for better or worse, tends to be drawn toward response. However, the real, the most important work, from my perspective, happens during mitigation and preparedness. I see a lot of our programming, you know, food pantries and childcare programs, and men's and women's groups and youth programs, and all of those things to really address mitigation and preparedness.

From a social standpoint, and I think it has it will continue to make a big difference for us (Interview 18, Pos. 28).

Additionally, another manager provides an example of extending their services to different communities,

In other states, we're launching, this fall we'll be offering [Anonymized State] crisis services. We're offering a separate location in [Anonymized City] to handle the [Anonymized State] crisis line. So, we're growing, and we're changing (Interview 5, Pos. 78).

Disaster relief nonprofit organizations also adjust their collaborative relationships to the changing environment. One of the interviewees mentioned that they started to build collaboration with insurance companies to achieve their mission in disaster mitigation,

We're currently trying to work with the insurance companies to get some funding that way by essentially going out as risk assessors and going to the clients of these insurance companies and assessing their properties and saying, hey, you know, these trees are going to be an issue, you know, or your roof has XYZ issues that right now are fine, but should a hurricane hit, you're going to have these problems. And then also, if we can get mitigation funding...then we'd be able to go in and actually do these repairs and mitigation projects for them. And ultimately, in the long run, it'll save the insurance company's money because their claims drop after a hurricane (Interview 27, Pos. 100).

Although many nonprofits show their interest in building and maintaining partnerships and collaborations, some interviewees mentioned that COVID-19 impedes their efforts in collaboration and they lose partners because of the pandemic,

I think a lot of it had to do with people were afraid to come out and help. And some of the areas we have in our county can't be remote. You know, the east side of our county is a very rural area. So they're not always able to connect on a computer and do like a Zoom call. So that was a big issue (Interview 10, Pos. 66).

A survey question was also included to capture the adaptations of disaster relief nonprofits in the questionnaire. Respondents were asked to report the adaptations that they have made in the past 5 years. Sixteen choices, such as downsized disaster relief programs, digitalized service provision, and collaborative agreement development, have been listed to capture the adaptations of disaster relief nonprofit organizations based on both the interview data and the literature. Around 10% of responded organizations (8 out of 79) mentioned that they do not make any adaptations (see Table 6). Other disaster relief nonprofits report their adaptations in current service programs, service extensions in new fields or stages, innovative service provision, internal management adaptations, and collaboration adaptations. The most common adaptive practice for disaster relief nonprofits is collaborative relationship development. Fifty disaster relief nonprofits have built new collaboration agreements and have a broader collaborative network, and 39 respondents report their start and expansion of disaster relief programs. Thirty respondents also indicate that they have modified their volunteer and staff management, such as providing online training during the COVID-19 pandemic.

Interestingly, not all disaster relief nonprofit organizations have expanded their programs. Nine organizations have downsized their disaster relief program, and 5 responding organizations have temporally suspended their disaster relief services. Likewise, not all the organizations develop new partnerships and collaborative programs,

4 organizations in Florida and New Jersey mentioned that they have reduced their efforts in collaboration or partnerships. Additionally, 23 respondents pay attention to long-term recovery, and 19 organizations extend their services in man-made disasters.

The comparison of disaster relief nonprofits' adaptations among three states based on the descriptive statistics also indicates that a higher percentage (44.44%) of respondents in New Jersey have put efforts into applying new models and technologies in disaster relief services compared to nonprofits in Arizona and Florida. Arizona disaster relief nonprofits report more adaptations regarding volunteer and staff management (45.83%) and the relatively high chance of new technology applications in service provision. In Florida, six organizations have reported the adaptation of downsizing disaster relief programs, and 3 respondents also reduced their efforts in collaboration.

Table 6. Adaptations of Disaster Relief Nonprofits

Adaptations	Adaptive Strategies	Arizona(n=24)	Florida(n=33)	New Jersey (n=18)	Total (n=75)
Existing Service Adaptations	Started/expanded disaster relief program	12	17	8	39
	Downsized disaster relief program	2	6	1	9
	Temporarily suspended disaster relief services	2	3	0	5
Service Extension and Adaptations	Started to provide non-disaster services	3	6	3	14
	Switched from short-term response to long-term recovery	6	8	8	23
	Extended service from natural disaster to man-made disaster	6	6	6	19
Innovation in Service Provision	Applied new models for providing disaster relief services (e.g., one-stop shop)	2	6	8	18
	Applied new technologies in service provision (e.g., GIS, dashboard)	8	7	8	25
	Digitalized service provision	6	5	4	16
Internal Management Adaptations	Renamed/rebranded the organization	3	3	0	6
	Modified volunteer or staff management (e.g., online training)	11	10	7	30
	Modified logistics (e.g., new warehouse, new supply chain)	3	7	3	14
Collaboration Adaptations	Built new collaborative agreements with other agencies or organizations	14	20	13	50
	Engaged in or started a new collaborative network (e.g., coalition)	9	12	8	32
	Reduced efforts in collaborations or partnerships	0	3	1	4
No Adaptations	No adaptation	1	4	2	8

Measures of Dependent and Independent Variables

Targeting the impact of dynamic capabilities on the performance of disaster relief nonprofits at both organizational and network levels, this research has 3 key dependent and independent variables. The first dependent variable (see Table 7) is the performance of disaster relief nonprofit organizations, which encompasses three dimensions: disaster relief service provision, engagement in public policy, and cultivation of community social capital. Respondents are asked to indicate their agreement from 0 (strongly disagree) to 10 (strongly agree) about 10 statements in total regarding each aspect of the performance. Specifically, there are 4 statements about disaster relief service provision. Another three questions, including the participation of state/local government committees/commissions, the connection with public officials, and the influence on disaster policy-making, are answered by disaster relief nonprofit organizations to reflect their performance of public policy engagement. Social capital cultivation is measured by whether disaster relief nonprofits promote neighborhood support, local collaboration, and prosocial behavior in the community. The means of corresponding statements are calculated, respectively, to reflect organizational performance in disaster relief service provision, public policy engagement, and social capital cultivation.

Another set of dependent variables is related to disaster relief nonprofits' network involvement. Network engagement is measured by the incidence of being a member of the VOAD/COAD network or not. Regarding the benefits, based on the interview data and existing literature, there are three main benefits—volunteer support, financial benefits, and reputation improvement—that VOAD/COAD members are expected to acquire from the network. Respondents who indicate that they are VOAD members

or/and COAD members are guided to answer their gained benefits from the corresponding network. Benefits of volunteer management include getting volunteer resources from other member organizations in the network and promoting volunteer engagement in non-disaster seasons. Financial benefits are provided through multiple ways, such as sharing available funding information, starting joint programs, getting financial support, and receiving valuable goods from other network members. Reputation improvement is measured directly by asking whether VOAD/COAD members acquire a better reputation and a higher level of legitimacy by engaging in the network. The respondents evaluate their agreement level for multiple statements from 0 (definitely no) to 10 (definitely yes) to indicate the perceived benefits of the network. The mean values of the corresponding questions are calculated to reflect the organizational benefits of volunteer support and financial opportunities from the VOAD/COAD network. The initial response for reputation improvement is used since only one statement is applied to measure this dimension.

Table 7. Measurements of Dependent Variables

Performance	Variables	Measurement	Survey Questions
	Service Provision	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)	<p>How much do you agree with the following statements about your organization’ s disaster relief performance in general?</p> <ul style="list-style-type: none"> • My organization meets communities’ unmet disaster relief needs. • My organization pays attention to the underrepresented groups who could be or were affected by disasters. • My organization provides prompt, accessible, and courteous services either before, during, or after disasters. • My organization provides cost-efficient disaster relief services.
Organizational Level	Public Policy Engagement	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)	<p>How much do you agree with the following statements about your organization’ s disaster relief performance in general?</p> <ul style="list-style-type: none"> • My organization participates in state/ local government committees/commissions. • My organization meets with state/local public officials and staff (e.g., emergency management director and staff, elected officials, etc.); • My organization influences state/ local disaster-related policy making,
	Social Capital Cultivation	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10“strongly agree”)	<p>How much do you agree with the following statements about your organization’ s disaster relief performance in general?</p> <ul style="list-style-type: none"> • My organization educates local community members to help neighbors during disasters. • My organization strengthens local community collaboration for disasters. • My organization improves the engagement of community members (e.g., volunteering, donating) for disaster relief.

Table 7. Measurements of Dependent Variables (continuous)

Performance	Variables	Measurement	Survey Questions
Network I Level	Network Engagement	0 represents neither VOAD nor COAD member. 1 represents VOAD/COAD members	<p>What option best describes your organization? <i>Note:</i> VOAD refers to Voluntary Organizations Active in Disaster, COAD refers to Community Organizations Active in Disaster</p> <ul style="list-style-type: none"> • VOAD or VOAD member • COAD or COAD member • Both VOAD members (including COAD and other members) and COAD member • Neither VOAD nor COAD member
	Volunteer Support	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)	<p>Does your organization get the following benefits by participating in the VOAD/COAD?</p> <ul style="list-style-type: none"> • Getting volunteer support from other member organizations • Keeping volunteers engaged and active in non-disaster settings;
	Financial Benefits	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)	<p>Does your organization get the following benefits by participating in the VOAD/COAD?</p> <ul style="list-style-type: none"> • Getting information about potential funding or starting a joint grant application • Getting financial support • Getting goods & supplies (e.g., PPE, trucks) from other member organizations • Starting joint programs with other organizations
	Reputation	Value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree.”)	<p>Does your organization get the following benefits by participating in the VOAD/COAD?</p> <ul style="list-style-type: none"> • Acquiring a good reputation and legitimacy.

The independent variable of this research is dynamic capabilities (see Table 8). Sensing, learning, integrating, and coordinating are four types of dynamic capabilities for organizations to adjust to external environments (Pavlou & El Sawy, 2011). The sensing capability is measured by the means of the agreement levels for four statements regarding new information accessibility, frequent environmental scanning, periodic discussion about environment change, and noticing of better practice strategies.

The learning capability measurements capture both the capability of learning new knowledge, assimilating it, and transferring the new knowledge into helpful practices. The mean value of the three statements is calculated to reflect the learning capability.

Another four statements measure the integrating capability, especially for volunteer-based disaster relief nonprofits. Whether staff/volunteers and organizational managers are on the same page about organizational decision-making and implementation and whether the work conducted by staff/volunteers is well-integrated are measured to reflect the integrating capability of disaster relief nonprofit organizations. The agreement level from 0 (strongly disagree) to 10 (strongly agree) is checked by the respondents to indicate their perceived level of organizational integrating capability.

Coordinating capability is measured by the mean value of the following four statements: 1) My organization has appropriately allocated resources for adjusting to the environment; 2) My organization has properly assigned tasks to the right personnel(s) with adequate knowledge for implementing the adaptation/change; 3) My organization has been well coordinated to adapt to the environments; and 4) My organization has demonstrated strengths in adapting to the environments.

Table 8. Measurements of Independent Variables

Variables	Measurement	Survey Questions
Sensing Capability	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)	<p>Thinking about the practice and adaptation(s) your organization has made over the past 5 years, how much do you agree with the following statements about your organization’s sensing and learning capabilities?</p> <ul style="list-style-type: none"> • My organization has known how to access new information (e.g., knowing popular-used websites, workshops/conferences in the disaster relief field) • My organization has frequently scanned the environment (e.g., government policies, opening funding opportunities, local needs) to improve disaster relief services; • My organization has periodically discussed and evaluated the likely effect of changes in the field (e.g., legal changes, COVID-19 infection rates, the local leadership of the emergency management department); • My organization has noticed the best practices (e.g., good strategies and models) in the disaster relief field.
Learning Capability	The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)	<p>Thinking about the practice and adaptation(s) your organization has made over the past 5 years, how much do you agree with the following statements about your organization’s sensing and learning capabilities?</p> <ul style="list-style-type: none"> • My organization has devoted enough time to gaining new disaster relief knowledge (e.g., through ground learning, workshops, training, and feedback); • My organization frequently has had group discussions/meetings to assimilate lessons learned on the ground, in workshops, and from feedback; • My organization has utilized new knowledge to develop new practices (e.g., using knowledge to address different types of disasters or providing services in different regions).

Table 8. Measurements of Independent Variables (continuous)

<p>Integrating Capability</p>	<p>The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)</p>	<p>Thinking about the practice and adaptation(s) your organization has made over the past 5 years, how much do you agree with the following statements about your organization’s integrating and coordinating capabilities?</p> <ul style="list-style-type: none"> • My organization has involved staff/volunteers when making decisions about changes. • My organizational staff/volunteers have recognized each other’s responsibility for implementing the adaptation. • My organization has communicated well, and all staff and/or volunteers have been on the same page about the organizational change. • My organization has effectively integrated efforts from each staff member/volunteer to make the change successful.
<p>Coordinating Capability</p>	<p>The mean value of the survey items measured on an eleven-point Likert scale (from 0 “strongly disagree” to 10 “strongly agree”)</p>	<p>Thinking about the practice and adaptation(s) your organization has made over the past 5 years, how much do you agree with the following statements about your organization’s integrating and coordinating capabilities?</p> <ul style="list-style-type: none"> • My organization has appropriately allocated resources for adjusting to the environment. • My organization has properly assigned tasks to the right personnel(s) with adequate knowledge for implementing the adaptation/change. • My organization has been well coordinated to adapt to the environments. • My organization has demonstrated strengths in adapting to the environment.

Nonprofit characteristics, environmental uncertainty, network capability, and network embeddedness are measured by organizational size, age, leadership, perceived environmental uncertainty, the engagement level of VOAD/COAD members, and the active operation of VOAD/COAD. APPENDIX E and F present the definition, measurements, and survey questions of the control variables for nonprofit performance at both organizational and network levels.

Analysis of Research Questions

Research Question 1

As mentioned previously, the 31 interviews have been transcribed and the researcher use both deductive and inductive approaches to develop the coding. Specifically, to explore the process of adaptation in disaster relief nonprofit organizations, the coding process is guided by the theory of dynamic capabilities to capture the four stages — sensing, learning, integrating, and coordinating — of organizational adaptation (Pavlou & El Sawy, 2011). Within each stage, I use an inductive coding approach to explore the emerging themes and recognize “something important about the data in relation to the research question and represents some level of patterned response” (Braun & Clarke, 2006). Finally, there are 11 codes emerging under the 4 themes—sensing, learning, integrating, and coordinating, and 3 codes emerged to illustrate the relationship among the stages (see Table 9 for the codebook). The detailed results are presented in Chapter 5.

Table 9. Codebook about the Procedures of Adaptations

Name	Subcode	Definition	Examples
Sensing	National Guidance and Request	Updates of service provision standard from national association and headquarters	Recommendations of follow the best practices on the animal search and rescue white paper provided by National Animal and Agricultural Emergency Services Group.
	Personal Connection and Network	Information is collected through interpersonal communication.	Executive director decides to create fee-based service because of friends' experience.
	Community Needs Evaluation	The process of assessing community needs through survey, communication, and observation	Organization engages in community meeting to understand multiple needs within the community.
	Previous Limitations	Failures and negative results in previous service provision practice	The leader pays attention to the failure of closing shelter on time.
	On-site/Ground learning	Efforts of observing and digesting the skills through on-site practice	Observing the practice of wildfire response in order to better respond to wildfire disaster.
Learning	Peer learning	Knowledge updates and the new skills are learned from the colleagues and collaborators.	The collaborators hold meeting together to learn the diversity of need and cultural background in order to create new agreements
	Targeted training	Courses and lectures provided by organization to improve organizational learning	The national office creates the training to fit the change at the state office and local chapter.

Table 9. Codebook about the Procedures of Adaptations (continuous)

Name	Subcode	Definition	Examples
Integrating	Bottom-up Approach	Organizational consensus is from staff and volunteers to leaders.	Staff and volunteers learned that there is a need for digitalization to improve volunteer management, they report to leaders and result in an organizational policy change.
	Top-down Approach	Organizational consensus is from leaders to staff and volunteers.	Leaders notice the change of community needs for COVID and update the protocol for staff and volunteers.
Coordination	Organizational Resource Redistribution	Redistributing human resources, funding, and equipment for adaptation	Organization has new staff to be the elected official liaison.
	Channels from Partners	Seeking existing resources from collaborators and partners to achieve the adaptation.	Extending the service and changing the logistic management using the warehouse of the local partners.
	Strategic Connectivity	The applied strategies in the previous stage shed light on the strategies in the following stages.	When nonprofit leaders recognize new opportunities through interpersonal connection or their network, they also tend to collaborate with peers within the network to coordinate the adaptation.
Rhizome Feature	Temporal Simultaneity	The four stages is often vague and can happen simultaneously	Each experience teaches us something for next.
	Directional Flexibility	The direction does not follow the sensing, learning, integrating, and coordinating process, but show flexibility in directions.	Past learning process enables the leader to target and implement the new adaptation to seize the opportunity and fill the service provision gap.

Research Question 2

Linear regression with maximum likelihood estimator and robust standard errors (MLR) is used to examine the influence of dynamic capabilities on the performance of disaster relief nonprofit organizations in service provision, public policy engagement, and community social capital cultivation. The descriptive statistics (see Table 10) show that respondents tend to rank higher for their performance in service provision, with a mean value of 8.45 out of 10 points. While the average level of public policy engagement is 6.37, relatively lower than social capital cultivation (7.11) and service provision (8.45). The average score of perceived dynamic capabilities, including sensing (6.86), learning (6.52), integrating (6.99), and coordinating (7.28), of the disaster relief nonprofit organizations are around 7 out of 10. Additionally, the average importance of the disaster relief mission among the respondents is 5.86, reflecting that not all the responded organizations regard disaster relief as their primary mission. Organizational age is measured as an ordinal variable with 5 options, including less than 1 year, 1-3 years, 4-6 years, 7-9 years, and more than 9 years. Because of the biased responses, the five options were recoded as less than 9 years and more than 9 years. More than 70% of the organizations have been operating for more than 9 years, and only around one-third of the respondents are not engaged in the VOAD/COAD network. Surprisingly, around 25% of respondents indicate that their organization faces a medial- to high- level of uncertainty, which reflects that the operational environment of the responded nonprofit is relatively stable.

Table 10. Descriptive Statistics for Organizational Performance

Variable	Sample Size	Percentage (%)	Mean	Standard Deviation	Minimum	Maximum
Nonprofit Performance						
Service provision	71		8.45	1.61	1.50	10.00
Public policy engagement	67		6.37	2.62	1.00	10.00
Social capital cultivation	71		7.11	2.47	1.00	10.00
Dynamic Capabilities						
Sensing	70		6.86	2.32	0.50	10.00
Learning	69		6.52	2.45	0.00	10.00
Integrating	70		6.99	2.32	0.50	10.00
Coordinating	71		7.28	2.17	0.00	10.00
Organizational Feature						
Disaster relief focus	71		5.86	1.44	1.00	7.00
Leadership	71		6.19	1.00	2.50	7.00
Organizational size (ln)	60		5.90	2.97	0.00	13.82
Organizational age	71	71.83			0	1
Environmental Influence						
Uncertainty level	70	25.71			0	1
VOAD/COAD engagement	71	69.01			0	1

Research Question 3

The Mann-Whitney U Test is applied to first compare the difference in dynamic capabilities, organizational characteristics, and environmental uncertainty between the VOAD/COAD members and non-members. Since the variation of each factor is examined independently using the Mann-Whitney U Test, with fewer restrictions on the same size and the power of the model, this research separately analyzes multiple perspectives of organizational characteristics and environmental uncertainty. Specifically, instead of using the total perceived uncertainty, as applied in the multiple linear regression models, the influence of disaster frequency, financial pressure, leadership change, competition, policy change, the COVID-19 pandemic, and climate change are separately examined. The same as the organizational characteristics, including organizational mission, age, size, and if they are more volunteer-based and local-oriented or not (see APPENDIX G).

The descriptive statistics of each group (see Table 11) show that the VOAD/COAD members view disaster relief as a more important organizational mission with a mean value of 6.18, compared with the mean value of 5.00 in the non-VOAD/COAD member group. The operational budget of the VOAD/COAD members, which reflects the organizational size, also has a higher average number (M=6.35) than the mean value (M=4.87) of the non-member group. Among the dynamic capabilities, only the mean level of learning capability between VOAD/COAD members and non-members shows a substantial distinction (M=46.90 for VOAD/COAD members and M=5.56 for non-VOAD/COAD members). Interestingly, VOAD/COAD members report a higher level of perceived sensing, learning, and coordinating capabilities, but the

average number of their integrating capabilities is lower than those organizations with no VOAD/COAD engagement. Furthermore, compared with the non-VOAD/COAD members, VOAD members are more aware of climate change.

Following the exploration of the differences between VOAD/COAD members and non-members, this research focuses on the dynamic capabilities of the VOAD/COAD member organizations and uses multiple linear regression with MLR estimator to examine the impact of dynamic capabilities on network benefits regarding volunteer support, financial opportunities, and reputation improvement (see Table 12). The average level of gained benefit in reputation improvement (6.33) is higher than the benefits regarding volunteer support (4.59) and financial opportunities (4.45). The mean values of dynamic capabilities, including sensing, learning, integrating, and coordinating, are above 6.5, and the scores for sensing and coordinating are even more than 7, which reflects that VOAD/COAD members hold a relatively positive perception towards their organizational dynamic capabilities. Regarding the features of the VOAD/COAD network, the average value of network capability, specifically measured by the active level of the network, is 5.33, with a relatively small standard deviation ($SD=1.48$). More than half of the responded nonprofits are VOAD members. They engage in the state-level VOAD, while around 45% of the respondents are from the community-level organization active in disaster. The organizational characteristics also show some variations. The mean value of engagement level for disaster relief nonprofit organizations is 5.51, which indicates that these organizations, on average, hold a neutral attitude toward engaging in the network. The average amount of operational budget for these nonprofits is around 757 thousand ($\ln 6.63$), conveying that they are relatively mid-sized nonprofit organizations.

Table 11. Mann-Whitney U Test for Non-VOAD/COAD and VOAD/COAD groups

Logistic parameter	Non-VOAD/COAD MEMBER			VOAD/COAD MEMBER			Z (70)
	SIZE	M	SD	SIZE	M	SD	
Dynamic Capability: Sensing	15	6.32	2.54	45	7.11	2.17	-0.90
Dynamic Capability: Learning	18	5.56	2.75	46	6.90	2.19	-1.74*
Dynamic Capability: Integrating	21	7.42	2.34	46	6.93	2.31	0.93
Dynamic Capability: Coordinating	18	7.15	2.44	45	7.57	1.84	-0.32
Organizational Mission	23	5.00	1.91	50	6.18	1.19	-2.85**
Organizational Size	21	4.87	3.35	40	6.35	2.71	-1.91*
Internal: Leadership Change	22	2.55	3.90	48	5.15	3.61	-2.72**
External: Climate Change	22	2.36	3.39	48	4.10	3.63	-2.16*

Note. Only dynamic capabilities and variables with significant differences between VOAD/COAD members and non-members are reported.

Table 12. Descriptive Statistics for Network Benefits

Variable	Sample Size	Percentage (%)	Mean	Standard Deviation	Minimum	Maximum
Network Benefits						
Volunteer support	60		4.59	3.05	0.00	10.00
Financial benefits	62		4.45	2.79	0.00	10.00
Reputation and legitimacy	61		6.33	3.44	0.00	10.00
Dynamic Capabilities						
Sensing	66		7.03	2.21	3.00	10.00
Learning	66		6.67	2.35	2.67	10.00
Integrating	66		6.71	2.32	0.50	10.00
Coordinating	66		7.49	1.94	3.25	10.00
Network (VOAD/COAD) Feature						
Network Capability	64		5.33	1.48	2.00	7.00
VOAD member		54.55			0	1
Nonprofit Feature						
Embeddedness level	65		5.51	1.67	1.00	7.00
Organizational size (ln)	51		6.63	2.65	1.79	13.82

Conclusion

This chapter illustrates the procedure of data collection and analysis. The data collection procedures cover the states of Arizona, Florida, and New Jersey, considering the geographic location, disaster losses in the past years, and the proposed role of disaster relief nonprofit organizations in state-level plans. The deductive and inductive methods are applied to analyze the interview data, while the Mann-Whitney U Test and linear regression with MLR estimator

are utilized for the analysis based on the survey data. The descriptive statistics about the roles and adaptations of disaster relief nonprofits show that responded organizations primarily engage in disaster response and recovery, although some are also involved in pre-disaster preparedness and mitigation. Using ESFs and the interview data, the service provision of disaster relief nonprofit organizations has been categorized into 9 types. Mass care is the major area for disaster relief nonprofits to engage in emergency management. At the same time, there is also a variation among states. New Jersey shows its uniqueness in paying attention to pre-disaster education and rights protection through advocacy and legal support. Florida and Arizona nonprofits are actively engaged in communication and logistics. Only 10% of responded organizations report no adaptation. The rest of the respondents pay attention to adapting their current program, extending their service provision, applying innovation strategies, modifying internal management, and conducting collaborative adaptations. The descriptive statistics regarding three research questions are also reported in this chapter.

CHAPTER 5

STRATEGIES AND PROCEDURES OF DISASTER RELIEF NONPROFIT

ADAPTATION

Using both the inductive and deductive approaches, the study explores the adaptation process of disaster relief nonprofit organizations. This chapter first depicts the adaptive strategies applied by the organizations to conduct sensing, learning, integrating, and coordinating, followed by surprising findings about the rhizomic features of adaptations in disaster relief nonprofits.

Sensing Stage

National guidance is one of the critical approaches for local disaster relief nonprofit organizations to explore new opportunities and needs for adaptation. This approach is common for organizations with a strong vertical connection, either partnering with national-level organizations or as a local chapter. When mentioned the adaptation regarding volunteer management and training, one of the vice executive directors describes the influence of national associations, “It was like, hey, we recommend that you follow the best practices on the animal search and rescue white paper basically, by [Acronymized Organization], which is a national animal and agricultural emergency services group (Interviewee 1, Pos. 62).” The guidance from the national association indicates the trend for disaster relief nonprofits to change their volunteer management standards, especially for the training modules. Additionally, the mission change at the national level induces changes at the local level. Interviewees mentioned that adding disaster relief as part of the organizational mission is because the national headquarters

started to be a member of National VOAD and separate funding to support the efforts of disaster relief:

The [Anonymized Organization] had got a huge grant from a corporate, from a foundation, to put together these community college business continuity plans for each in the [Anonymized Organization]... And the [Anonymized Organization] joined the National VOAD and was a member of the National VOAD. So it was in the DNA. Since 2010, we do that in a more organized, identified fashion... set up a disaster fund immediately for contributions and to manage that fund in terms of distribution of funds (Interviewee 7, Pos. 123).

Using personal connections and networks to recognize new opportunities and make adaptations is also common in practice. The connections can bring nonprofits new strategies and resources so that they can survive through adaptation. Changing a nonprofit into a social enterprise to get additional resources and achieve financial resilience is the strategy adopted by one of the disaster relief nonprofit organizations. The executive director mentioned that the suggestion is from a friend,

I see it is absolutely imperative that I figure out, as a leader, how to create a social enterprise as part of my organization ... I have a dear friend that been with me through these disasters the past nine and a half years... the example that she is doing is she works with food insecurity ... she wants a pantry. And she is creating a restaurant... She's going to use the staff of highly functioning disabled adults to be trained, that will be a training service program. Then the profit from the restaurant will go back into the nonprofit side (Interviewee 13, Pos. 108).

Although the model does not perfectly fit into the needs of the disaster relief nonprofit, it still provides implications as she said, “It's not like I can say we're going to do disaster snow cones, like that won't work. But I think that there are maybe some unique pathways to do good work to generate a fair fee for service (Interviewee 13, Pos. 108) .” Having similar experiences of using interpersonal connections to explore new opportunities, the leader of a local nonprofit in Florida recalled his experience of revising organizational mission because of his personal connection with the director of the department of emergency management. He mentioned,

A few years ago, I, along with [Anonymized Person] blessing and help, rewrote the mission statement (Interviewee 29, Pos. 27)”, “I tell [Anonymized Person] and our board this, you know, basically, if it weren't for [Anonymized Person], [Anonymized Organization] would not be where it is today. We would not be, we would still be a hell of struggling to get there. And we really wouldn't bear any cloud or have any ongoing information (Interviewee29, Pos. 39).

The third common approach for disaster relief nonprofits to perceive the adaptation needs, especially regarding service provision, is by conducting community needs evaluations. For instance, the preparation of initiating a new program for service provision is associated with a process of evaluating unmet needs. As the interviewee mentioned,

There's often a technical research component, examining social vulnerability indexes, and sort of doing an audit of resources that already exist within that community. And there's sort of a qualitative aspect to it, as well, you know, can

often involve interviewing or surveying clients, and residents, or other partners that are working in the community. And just sort of combine those two factors...to identify what the highest need or the gap in service might be. And that's a process that is required for, you know, new programming initiatives (Interviewee 18, Pos. 66).

When being asked why the organization notices the necessity of adaptation, another leader mentioned that getting feedback and organizing community meetings provides them with information regarding needs for adaptation,

We have forms where the community could come in, and they can sit down and talk to someone and we would just say, hey, what do you need, we did a special program for the school-based population where we had teachers and school administrators come in, and kind of just talk with us about their impacts from Hurricane Michael. And just in that discussion, you kind of pick out different needs (Interviewee 22, Pos. 52).

Besides the strategies of sensing adaptation needs through national guidance, interpersonal connections, and the community needs evaluation, previous challenges or limitations in service provision also motivate disaster relief nonprofits to start the adaptation process. For instance, a nonprofit creates a new position to address previous problems:

What we found is that elected officials get very involved when there's a disaster in their area. They often will run to the press and complain about, you know, whether it's the [Anonymized Organization] or some other nonprofit not doing

their job, and then we start to get bad press. All right. And then that's not good for every you know, all the reasons you can imagine. So about two years ago, we implemented a brand-new position. It's called an elected official liaison (Interviewee 6, Pos. 154).

Additionally, previous challenges in providing sheltering service for small but frequent disasters make the nonprofit seek new strategies and build strong collaboration with churches, “We get our churches to possibly shelter people. The reason for doing it is because we've seen that there have been challenges in the past in finding small sheltering and organizations that have had to pay money for hotels (Interviewee 26, Pos. 136).”

Learning Stage

Updating and learning new knowledge to match the needs of new opportunities is the next step of adaptation (Pavlou & El Sawy, 2011). There are three recognized approaches, on-site/ground learning, peer learning, and well-organized training, to acquire and update knowledge for the potential opportunity. In order to identify how to provide disaster relief service in a different setting, one of the interviewees mentioned that,

We're learning about fires. And that's why I was on the road in Colorado and in Oregon most recently. So, we don't have a lot of experience in fires yet. And that's what we're trying to figure out. We were out there getting an education...we have something called [Anonymized Project]..., we are trying to absorb as much information talking to fire survivors (Interviewee 25, Pos. 120).

The ground observation provides new knowledge for the nonprofit organization to adapt their service provision for wildfires. On the other hand, some nonprofits start pilot programs as a ground-learning opportunity. As one of the executive directors states,

we were discovering that a lot of Hispanics... they see the [Anonymized Organization] is affiliated with government..., so they won't come to our shelter...okay, how do we do this better? So we came up with a Latino engagement initiative, where we started talking to churches and places that had a lot of Latino clients...and just educating, educating, educating and being accessible... So that's the kind of thing (we do not know) is it going to work? Is this going to catch on? (So, we) pilot it in a region that has a lot of Hispanic people (Interviewee 16, Pos. 69).

The pilot program not only tests the effectiveness of the initiative but also updates new knowledge of promoting service provision for the Latino community and formally implementing the new program.

Peer learning, which refers to the knowledge updates and obtaining from collaborators, other nonprofit organizational leaders, or friends to seize perceived opportunities, is another approach. An example is that the disaster relief nonprofit organization decided to develop a new collaborative agreement to improve the efficiency of providing food service after a disaster. The approach for them is that they learn from each other.

We've decided ...to take these relationships we already have and really formalize...it's good for learning from one another...we spent a couple of months just trying to learn, like what is everybody understanding, how you respond to a

tornado in Oklahoma versus a Hurricane Attack, versus a wildfire in Arizona, is dramatically different (Interviewee 3, Pos. 124) .

They can recognize the needs of each organization within the agreement and learn from each other to update their knowledge before implementing the adaptation. Besides getting new knowledge from partners and collaborators for adaptation, nonprofits also use board members, who are also leaders of other organizations, as critical resources to update knowledge. As a leader mentioned,

I take it (the new opportunity) to my board chair. And I'll say, well, look, you're from Corporate America, how would you handle this? Sometimes an outside perspective helps with adapting. We also talk to each other if the CEO in [Anonymized Organization] is rocking in and rolling with a new initiative, and I don't really know how it works (Interviewee 16, Pos. 89).

Communication with the board members, collaborators, and peers enables the nonprofit leaders to learn new knowledge and figure out the implementation side of organizational adaptation.

Using well-organized training modules to update knowledge, especially when there are new potential adaptations regarding technologies and service provision, is another common approach. The training sessions are generally provided by national headquarters if the nonprofit is a state or a local chapter of a national or international nonprofit. One of the interviewees mentioned that “our national office kind of creates the training, you know, to fit what we do (Interviewee 20, Pos. 78).” Using training materials provided by governments to fit into and guide the potential adaptation is also an effective approach. As a leader mentioned that in order to understand the emergency management

system and better define the approaches of new agreements that they tend to adapt to, the learning process is that “we’re actually doing ICS training together as a group today and starting to really look at how do we formalize some of those processes and partnerships (Interviewee 2, Pos. 22).”

Integrating Stage

The sensing stage aims to scan the environment and find out new opportunities for adaptation, while the learning process helps the organization to update the knowledge to successfully plan and implement the adaptations. The learning process first happens at the individual level (Kim, 1993) and then transfers into an organizational decision, which is defined as the integrating or decision-making stage based on the existing theory of dynamic capabilities (Pavlou & El Sawy, 2011; Li & Liu, 2014).

There are two strategies, the top-down approach and the bottom-up approach, to describe how to transfer individual-level new knowledge into an organizational-level agreement regarding adaptation. The nature of the integrating process is the knowledge transformation within the organization. The top-down approach describes the process that leaders at the nonprofit update their knowledge and develop a future vision about adaptations. They then share it with employees and volunteers. The practice is much more common in big nonprofit organizations that have a clear bureaucratic structure. As the interviewee mentioned regarding the case management adaptation, “[Anonymized Organization] is this upper management hierarchy... So you're looking at the organizational chart. You have the CEO. I'm the chief program officer. You have the CCO and CFO. This is considered doing it from the top (Interviewee 19, Pos. 44).” The

power flow and structure results in different methods of integrating and reaching agreements within an organization.

The bottom-up approach reflects the knowledge updating process moving from the frontline employees to the decision makers within the organization. An interviewee said “I will reach out to my boss afterward and say, hey, you know, here are these things I’ve observed. And there might be policy changes, or something because of that bubbling up (Interviewee 6, Pos.150) .” The most common practice for the integrating part is associated with several rounds of communications and combined with both the top-down and bottom-up approaches. The interviewee who mentioned that he shared the new knowledge with the decision-maker also mentioned that he finally needs to obey the rules or the guidance from the top decision-makers, “Because we are this system, I can't go out and just decide, oh, I'm going to go do this new technology, it doesn't work with anything else, it would be a catastrophe (Interviewee 6, Pos. 90) .”

Coordinating Stage

The coordinating stage implements organizational agreement about adaptation and rearranges resources to achieve the adaptation successfully. Nonprofits either redistribute current resources, especially financial and human resources, or extend new resources through collaborating with partners. Redistributing current resources is the practice of rearranging employees or volunteers to take responsibility for adaptation. For instance, one of the leaders mentioned that in order to implement the digital transformation and apply new technology, the organization deploys volunteers as a separate group to conduct training,

We stood up technology, it's [Anonymized Technology]. So, we realized that people needed to be trained to use our technology...So, we have [Anonymized Team], it was made up of volunteers who understand the technology and are good trainers...they have to be really good at getting people excited about using the tools (Interviewee 16, Pos. 51).

Besides the redistribution of volunteer resources, nonprofits also seek better financial arrangements to support the new adaptation in the following years,

We look at our different sponsors and see, is an area that they're willing to support?...there's a lot of back planning and getting the financing and getting the funding for at least two years to make sure that hey, we're liquid for this so we can afford it (Interviewee 25, Pos. 140) .

In addition to relying on the redistribution of organizational resources, extending the resource network and using the channels of other partners to implement the project is another approach. The collaboration with new partners helps nonprofits extend their types of service in disaster relief and overcome the barriers of resource limitation when implementing the adaptations. An example of using collaborative networks to develop a new program is that the disaster relief nonprofit started to provide portable air conditioners to address extreme heat, they “in partnership with [Anonymized Organization], we reached out to [Anonymized Organization]and said, this isn't something that we carry, but would you donate? So they donated units to us (Interviewee 12, Pos. 82) .” Another interviewee mentioned their experience of switching organizational mission from disaster response and recovery to disaster preparedness and mitigation,

We're actually currently working with the insurance companies to get some funding that way by essentially going out as risk assessors and going to the clients of these insurance companies and assessing their properties and saying, hey, you know, these trees are going to be an issue, or your roof has XYZ issues that right now are fine, but should a hurricane hit, you're going to have these problems (Interviewee 27, Pos. 100).

Collaborating with private companies allows them to conduct risk assessments before disasters and make sure that communities are well-prepared.

Surprising Finding: A Rhizomic Approach of Adaptation

In the process of developing strategies for nonprofits to conduct the sensing, learning, integrating, and coordinating procedures, the strong connection among the four stages indicates that the adaptation of disaster relief nonprofits does not follow the linear approach but shows a strong non-linear relationship. Rhizome model, introduced by Deleuze and Guattari (1993) to describe the decentered and unruly social system, refers to a process that is “nonlinear, nonhierarchical, decentered, horizontal, and possessed with other qualities antithetical to the dominant paradigm. It may move in many directions, like rhizomes themselves” (Smagorinsky, Augustine & Gallas, 2006, p.101). Different from the linear and hierarchical paradigms, the rhizome model describes the horizontal expansion pattern, the process associated with multiple nodes that interweave within the procedures and can create new possibilities for growth through any node (Deleuze & Guattari, 1987). Regarding sensing, learning, integrating, and coordinating as different nodes in the system, the nonlinear interconnection of different stages represents a rhizomic feature.

There are three characteristics of the adaptation process— strategic connectivity, temporal simultaneity, and directional flexibility— that reflect the interconnection and non-linear approach of the rhizome model. Strategic connectivity represents that the four adaptive stages are not independent of each other. The applied strategies in the previous stage shed light on the strategies in the following stages. For example, when nonprofit leaders recognize new opportunities through interpersonal connection or their network, they also tend to collaborate with peers within the network to coordinate the adaptation. For instance, a leader mentioned that he senses the opportunity to engage in disaster preparedness and mitigation because of a conversation with one of his friends, and then they collaborated to address building code violation,

So, I went down to [Anonymized City] to the code enforcement office and talk to a friend of mine...he mentioned there are people that have code violations that are in a situation, they can't get it fixed. They don't have the means to help with the finances, nothing. And I said...we could work it through our collaborations as part of prevention and go fix those code violations. They won't cost the people that live there anything, becomes totally a charitable and benevolent act. But three things happen. Number one, the person who has the code violation now gets freedom..., if we do this, we're going to relieve the city or the county, we relieve them of that burden... He said we'll give it to me. So I set it up...we went and took care of the problem. Everything was lifted (Interviewee 29, Pos. 82).

Another case that shows the same connection between the stage of sensing and coordinating is that an interviewee, who is the leader of a nonprofit providing tools for debris removal, clean-up, and home rebuild, mentioned that her organization started to

address extreme heat because of the conversation with partners, and they directly collaborate to start new programs which achieve the service provision adaptation of the organization itself,

In fact, there were two separate organizations that came to us and asked us if we would participate in this. The [Anonymized Organization] is one of them, and [Anonymized Organization]... And they were already using us on the tool side, and they said, hey, what if we looked at this heat more holistically? How we can address it year-round? And so, it's really about creating the partnerships (Interviewee 12, Pos. 99).

Besides the strategic connectivity in different stages, the distinction among the four stages is often vague in some nonprofit organizations, and they can happen simultaneously. One of the interviewees described the procedures of starting the disaster relief nonprofit organization, and she mentioned,

When I was brought on board, as the first and only employee, and it basically said, go figure ... There were no guidelines of what a recovery organization was supposed to be. There was no, it was, you got it, go forth and do great things. And so, and honestly, I think this is where having a military background kind of came in, you know, we get in, and we just figure stuff out. And if it made sense to me, I ran with it (Interviewee 22, Pos. 123).

Considering the small organizational size, the procedures of implementing the adaptation are combined instead of following the step-by-step approach proposed by the linear model. Additionally, from the practitioners' perspective, organizational adaptation is a continuous process. The implementation of the previous adaptation is regarded as the

beginning of the sensing and learning approach for the next potential adaptation. Many of them mentioned,

It's a collaborative learning experience all of the time, each experience teaches us something for next" (Interviewee 11, Pos. 108). You have to find out what stopped the project... It's hard to mess up every day, doing the same thing, because you won't do it a third time. You might only because you didn't recognize it as a stop the second time (Interviewee 31, Pos. 95).

Learning is continuously happening and associated with the implementation of new adaptive actions. There is no clear start and end stage but a snowball rolling process showing in an interweaving way.

Directional flexibility is another characteristic of the rhizome model for nonprofits' adaptation. The linear model proposes that there is a procedure that follows the steps from sensing, learning, integrating, to coordinating. However, the direction is also flexible. For instance, when discussing why the organization pays attention to livestock protection in disaster settings and starts a new program of providing training services for the first responders, such as firefighters and police, the leader mentioned that,

I was a volunteer for the [Anonymized County] sheriff's office... I spent a lot of time volunteering for the sheriff. 12 years of service with them. 10 years I volunteered for the fire department and insert fire corps and things like that. So...I did all of those things so that I could understand how those organizations operated with each other and how we could best plug in to help them (Interviewee 8, Pos. 30).

The past learning process enables the leader to target and implement the new adaptation to seize the opportunity and fill the service provision gap. Instead of following the sensing approach as the linear model proposed, the learning stage happens before the sensing stage and guides the implementation stage. What's more, the integrating and coordinating process is not in a single direction that is from integrating to coordinating but shows an interactive process. An interviewee provides an example of adaptation regarding case management during the COVID-19 pandemic,

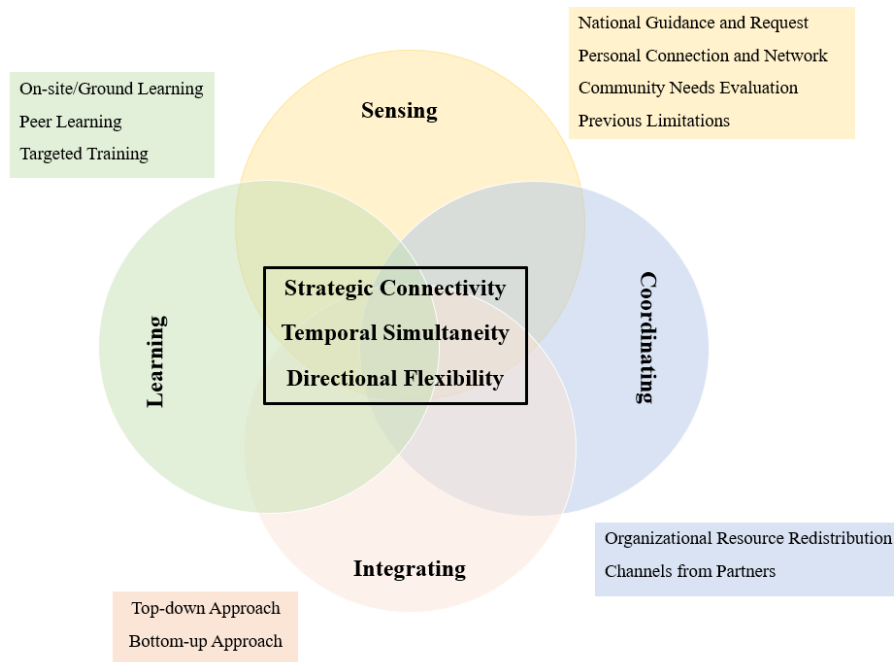
We had to adapt how we provided client casework after a house fire, for example... our volunteers joined the [Anonymized Organization], and those that specifically want to respond in the middle of the night and throw a blanket around a person and hug them, and hand a child a teddy bear, they were absolutely devastated that we said, we can't do it that way right now, we have to do it remotely. We can, you know, go to the fire and be there. But we're not going to go within six feet of this client. Now, they were grateful for the support. But it wasn't the same emotional connection (Interviewee 16, Pos. 81).

The decision has been made by the national organization, and the state division has to follow the decision and start to coordinate the adaptation. However, there is a feedback process from the coordinating stage to return to the integrating stage,

Our volunteers were very upset. And they left. We push back a bit with our national organization saying, look, we're the [Anonymized Organization], and we go into war zones to help people. Let us go, as long as we have PPE, let us go help our clients (Interviewee 16, Pos. 81).

Thus, different from the linear approach proposed by the existing literature, the rhizome model, representing strategic connectivity, temporal simultaneity, and directional flexibility, describes the decentralized and nonlinear approach for disaster relief nonprofits to make adaptations for the aim of adjusting to the environment. To summarize, the findings of this research are shown in Figure 6.

Figure 6. The Adaptation Procedures of Disaster Relief Nonprofits



Discussion

Overview of the Findings

Using interview data, this research explores strategies of disaster relief nonprofit organizations to sense the potential need for adaptations in the environment, update the knowledge, make agreements at the organizational level, and redistribute resources to implement adaptations. Interestingly, the findings indicate that instead of following a linear approach from sensing to coordinating, as existing literature proposed based on the

for-profit sector, the adaptation of disaster relief nonprofit organizations indicates a non-linear rhizomic approach, which is featured as strategic connectivity, temporal simultaneity, and directional flexibility among the stages. Specifically, strategic connectivity represents strategy interdependence in multiple stages. Using interpersonal connections to seek valuable information is associated with a coordinating process through employing channels from collaborators and partners. As another feature of the rhizome model, temporal simultaneity describes the no-end adaptation procedures. The implementation of the current adaptation serves as an opportunity for sensing and learning for the next potential adaptation. There is no clear start and end because a learning process is always operating to seek new opportunities. The feature of directional flexibility presents the interaction among different stages. Learning new knowledge sometimes promotes the ability to sense new opportunities in the environment. With a better understanding of the system and community needs, nonprofits can observe where and how they can contribute by adapting their organizational service provision or internal structure. Furthermore, there is an interconnection between the phase of integrating and coordinating through communication and feedback.

Merits of the Research

The first contribution of this research is to advance knowledge regarding the strategic adaptations of disaster relief nonprofit organizations. With the increasing frequency of disasters and the emerging of new types of disasters, such as the COVID-19 pandemic and mass shootings, nonprofits play an important role in disaster management, especially in supporting vulnerable groups, complementing service shortages from government, and cultivating social capital for community resilience (i.e., Garcia et al.,

2022; Chikoto-Schultz et al., 2019). However, little research explores the practice of disaster relief nonprofit organizations, especially how they adjust to the changing environment and continue to engage in service provision. This research provides not only detailed information about the adaptation of disaster relief nonprofit organizations but also their strategies for conducting adaptations. National guidance and signals, interpersonal connection and network, systematic community evaluation, and the previous limitations are approaches for disaster relief nonprofit organizations to sense the needs for organizational adaptation, while the associated learning strategies are on-site observation, peer learning, and well-organized training. The approach of making an agreement regarding adaptation is either through a top-down approach from leaders to the employees and volunteers or through a bottom-up approach from the frontline employees to the leaders of the organizations. The implementation is a process of redistributing current resources and employing the channels of other collaborators.

Another contribution of this research is to add to the existing discussion about nonprofit organizational adaptations. Nonprofit adaptation significantly impacts organizational survival and development because it is a common strategy to address financial crises and develop new resources for organizational expansion (Cooper & Maktoufi, 2019; Chen, 2021). Instead of paying attention to the question of what adaptation happens in the nonprofit sector and why organizations make adaptations as previous research has examined (i.e., DiMaggio & Powell, 1983; Hager, Galaskiewicz, & Larson, 2004; Cooper & Maktoufi, 2019), this research adds to the conversation about how disaster relief nonprofit organizations make adaptations. Through applying the theory of dynamic capabilities, the study depicts the process, from sensing, learning,

integrating, to coordinating, through which disaster relief nonprofit organizations make adaptations, and demonstrates that instead of following the process step by step, disaster relief nonprofit organizations take a rhizomic approach in order to adjust to the environment.

Additionally, the research serves as an opportunity to advance the conversation regarding the commonality and differences between for-profit and nonprofit organizations. The findings show that instead of following the linear adaptation procedures as the for-profit organizations do, the nonprofit organizations show a rhizomic approach in conducting organizational adaptation. The potential explanation of why there is a significant difference lies in organizational size, culture, and mission. Compared with for-profit organizations, non-profit organizations generally are smaller in size, especially for local nonprofit organizations. Some interviewees mentioned that they are the only person as the full-time employee. The majority of the interviewed organizations are volunteer-based. The tiny size of the organization saves energy for internal negotiation about adaptation. Previous literature also indicates that organizational size matters for the procedure of organizational change and management (Kimberly & Evanisco, 1981). Another possibility is organizational culture, which is defined as “a set of shared values that help organizational members understand organizational functioning and thus guide their thinking and behavior” (Jaskyte, 2004, p.159). Flexibility, adaptability, and innovation associated with nonprofit organizations can foster organizational effectiveness (Langer & LeRoux, 2017), and may lower the importance of rules in guiding organizational adaptations. The final potential reason is that the adaptation of disaster relief nonprofit organizations sometimes happens with the aim of addressing existing

crises or disasters. For instance, during the COVID-19 pandemic, disaster relief nonprofits need to fix the service provision mode in a limited time. The urgent needs also require organizations to be flexible and efficient in making adaptations.

Besides the contribution to the current literature, this paper also sheds light on the managerial practices of disaster relief nonprofit organizations. Some disaster relief nonprofit organizations have difficulty in making adaptation and innovation (Shin & McClomb, 1998), which may ultimately result in organizational failure. Bringing the topic of adaptation into the nonprofit field provides an opportunity for practitioners to pay attention to organizational adaptation and innovation. The strategies illustrated in the paper also imply useful approaches for disaster relief nonprofits to start and implement their adaptations. For instance, nonprofits with limited resources can collaborate with organizations to achieve their adaptation goal and promote their service provision. Government agencies that hold financial resources for disaster relief can also pay attention to and support nonprofit organizations in their adaptation, such as digital transformation and service mode change, because the adaptations improve the effectiveness of disaster relief nonprofits and can relieve the burden of government in responding to disaster relief needs.

Limitations and Future Research

The convenient sample from Arizona, Florida, and New Jersey in this research may be associated with certain bias because resource availability for disaster relief nonprofit organizations, which is critical for their adaptation, shows variations among states. Additionally, the snowball sampling process may also result in some bias since interviewees tend to introduce organizations that either collaborate with them closely or

provide similar types of services. Thus, there is a similarity in the type of disaster relief services, the size, or geographic locations of the responded organizations, while some disaster relief nonprofit organizations that provide more professional services, such as communications, transportation, or mental health, may not be included in the research. Also, this paper only focuses on disaster relief nonprofit organizations that provide direct service after disasters. Nonprofits focusing on advocacy or fundraising have not been fully explored in this paper. The limitation of current discussions also implies the potential future research topics. Exploring innovation and adaptation of disaster relief nonprofit organizations in other states and comparing the differences among these organizations would be an interesting topic. Additionally, the role of other types of disaster relief nonprofit organizations in disaster management also needs further exploration.

Conclusion

Disaster relief nonprofit organizations apply a rhizomic approach to conduct adaptations and adjust to the external environment rather than following the linear approach proposed by the theory of dynamic capabilities. The rhizomic features are categorized as strategic connectivity, temporal simultaneity, and directional flexibility. Strategic connectivity implies the strategy connections among the sensing, learning, integrating, and coordinating stages. The methods applied in each stage influence the availability of the strategies in the next stage. Temporal simultaneity represents the fact that the adaptations do not occur step by step. Organizations can conduct sensing, learning, integrating, and coordinating simultaneously. Directional flexibility emphasizes

that every stage can be a starting point for disaster relief nonprofits to make the adaptation successfully.

CHAPTER 6

DYNAMIC CAPABILITIES AND THE PERFORMANCE OF DISASTER RELIEF NONPROFITS: AT THE ORGANIZATIONAL LEVEL

This chapter examines the impact of dynamic capabilities on the performance of disaster relief nonprofit organizations, including service provision, public policy engagement, and social capital cultivation. The results of the three multiple linear regression models (see Table 13) indicate that there are variations in the association between dynamic capabilities and organizational performance according to both the type of dynamic capabilities and the dimensions of performance.

Dynamic Capabilities and Disaster Relief Service Provision

The first model examines factors that influence service provision of disaster relief nonprofit organizations. The finding shows that integrating and coordinating capabilities are significantly associated with the performance of service provision. Specifically, on the one hand, a one-unit increase in the integrating capability, on average, results in a 0.26 increase in the performance of disaster relief service provision ($\beta = 0.26, p < 0.05$). On the other hand, coordinating capability can negatively impact the performance of disaster relief nonprofits ($\beta = -0.29, p < 0.05$), supporting Hypothesis 1b while failing Hypothesis 1c because of negative influence. The other two types of dynamic capabilities, including sensing and learning, do not significantly change organizational performance in service provision, which fails Hypothesis 1a. Additionally, nonprofits with more operating budgets ($\beta = 0.32, p < 0.01$) and younger disaster relief nonprofit organizations ($\beta = -0.57, p < 0.05$) tend to have a better performance in providing disaster relief services.

Dynamic Capabilities and Public Policy Engagement

The results of Model 2 about public policy engagement show that sensing and integrating capabilities significantly shape the performance of disaster relief nonprofits. There is a positive relationship between sensing capability and public policy engagement. A one-unit increase in the capability of sensing leads to, on average, a 0.62 unit increase in the level of participating in disaster-related policy activities ($\beta = 0.62, p < 0.001$). While integrating capability negatively influences public policy engagement ($\beta = -0.33, p < 0.01$). Nonprofits with a higher level of integration capability show less enthusiasm for public policy engagement. The results support hypotheses 2a and 2c and fail hypotheses 2b and 2d. Moreover, organizational features can influence their performance. Disaster relief nonprofits operating for more than 9 years ($\beta = 0.42, p < 0.05$) and with a higher amount of operating budget ($\beta = 0.34, p < 0.01$) show a more active engagement in public policy discussion. While organizations that perceived a higher level of environmental uncertainty also tend to engage more in public policy compared with those organizations in a relatively stable environment ($\beta = 0.36, p < 0.05$).

Dynamic Capabilities and Social Capital Cultivation

Model 3 tests the relationship between dynamic capabilities and their performance in community social capital cultivation. The results indicate that learning capability can influence organizational efforts in social capital cultivation. Disaster relief nonprofits reporting a unit increase in learning capability is associated with a 0.52 unit increase in the performance of social capital cultivation ($\beta = 0.52, p < 0.01$). Hypothesis 3 is supported. Additionally, recognizing disaster relief as an important organizational mission encourages nonprofits to perform better in cultivating social capital within the

community ($\beta = 0.27, p < 0.01$). The size of disaster relief nonprofit organizations and the years that they have been working in the field also matter. Compared with younger and smaller organizations, those disaster relief nonprofits with a large amount of operational budget ($\beta = 0.24, p < 0.05$) and in the early or middle stage of their operation ($\beta = -0.74, p < 0.01$) tend to evaluate their social capital cultivation with a higher level.

Most interestingly, there are significant differences regarding the effect of dynamic capabilities, organizational features, and external environment on the performance of service provision, public policy engagement, and social capital cultivation in disaster relief nonprofit organizations. The impacts of organizational dynamic capabilities are not consistent. Sensing capability influences public policy engagement of disaster relief nonprofit organizations. Integrating capability matters for service provision and public policy engagement, although the influence effects are contrary. Learning capability affects social capital cultivation positively while coordinating capability negatively impacts service provision. Organizational size shows a constant and positive impact on all three dimensions— service provision, public policy engagement, and social capital cultivation of disaster relief nonprofits. Additionally, younger organizations tend to rank higher for their service provision and social capital cultivation performance while showing less engagement in public policy compared with their counterparts.

Table 13. Dynamic Capabilities and Nonprofit Performance ($N=71$)

Effect	Service Provision		Public Policy Engagement		Social Capital Cultivation	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	3.63***	0.89	-0.19	0.53	1.37*	0.67
Dynamic Capabilities						
Sensing	0.02	0.14	0.62***	0.13	0.07	0.17
Learning	0.22	0.25	0.03	0.16	0.52**	0.21
Integrating	0.26*	0.14	-0.33**	0.11	-0.22	0.15
Coordinating	-0.29*	0.16	-0.16	0.13	-0.09	0.11
Organizational Feature						
Disaster relief focus	0.14	0.16	0.10	0.09	0.27**	0.17
Leadership	0.03	0.12	0.05	0.10	-0.07	0.11
Organizational size (ln)	0.32**	0.13	0.34**	0.10	0.24*	0.13
Organizational age	-0.57*	0.29	0.42*	0.24	-0.74**	0.26
Environmental Influence						
Uncertainty level	0.25	0.20	0.36*	0.20	0.04	0.23
VOAD/COAD engagement	0.16	0.28	0.20	0.22	0.19	0.23
Model Fit						
AIC	273.23		302.14		314.37	
BIC	300.38		291.49		341.53	
R ²	0.25		0.63		0.43	

* $p < .05$, ** $p < .01$, *** $p < .001$; One-tailed tests.

Discussion

With climate change and economic development, there is an increase in the frequency of disasters and the amount of economic losses caused by disasters (NOAA,2023; Dinan, 2017). The strong connection with local communities and the capability to provide disaster relief services effectively (Demiroz & Hu, 2014) indicates the critical role of disaster relief nonprofit organizations in complementing the limitations of government and the for-profit sector. Disaster relief nonprofit organizations not only help other stakeholders, especially government agencies, to take out the burden of service provision (Tobin & Montz 2009) but also promote community resilience through public policy engagement and social capital cultivation (Aldrich & Meyer, 2015). The current discussions about disaster relief nonprofit organizations are centered on understanding the function of these nonprofits in disaster management networks and exploring their collaboration with other stakeholders (i.e., Kapucu, Arslan & Demiroz, 2010; Brower et al., 2009; Fan et al., 2019). However, with such a challenging and uncertain environment of disaster relief nonprofits because of the COVID-19 pandemic, surging service requests, and competition, little research targets the question of what capabilities help these organizations adjust to the environment and furthermore, what are the influence of these capabilities in ultimately impact the performance of disaster relief nonprofit organizations, especially their public value achievements (Moore, 2000). To answer the above questions, this research examines the impact of dynamic capabilities, which shapes organizational adaptation decision, on organizational performance in service provision, public policy engagement, and social capital cultivation.

Overview of the Findings

The results of the three models show that there are relationships between dynamic capabilities and nonprofit performance, but different types of dynamic capabilities shape the performance variously. First, integrating capability positively influences service provision, which is consistent with the finding that it can promote the performance of government agencies in providing e-business services (Daniel & Wilson, 2003). Specifically for disaster relief nonprofits, since many of them are volunteer-based, engaging both volunteers and staff in the conversation to integrate the new knowledge can help reduce the service provision barriers when they are deployed to do the case management. While a higher level of coordinating capability results in a lower level of performance in service provision. The potential explanation is that successfully allocating resources to implement changes and adaptation may cause a problem in maintaining current operations and organizational routine, especially when there are limited resources and when there is not an urgent need to implement the changes. Previous literature also shows that conducting organizational change often results in financial losses for the organization (Mellert et al., 2015), which can negatively impact the service provision performance in the short term.

Additionally, sensing capability significantly promotes public policy engagement since disaster relief nonprofit organizations with higher levels of sensing capability are more likely to notice the potential opportunities for them to communicate with government and become public service providers, which enables them to have more opportunities to influence public policy (Fyall, 2016). The integrating capability captures the sharing and integration of new information and knowledge among volunteers, staff,

and employees, which may not significantly and directly improve the relationship with government agencies. Moreover, the energy in maintaining internal management and making agreements within the disaster relief nonprofits may impede the available time and resources to make connections with external stakeholders, such as government.

Finally, social capital cultivation can be significantly improved if disaster relief nonprofits have a higher level of learning capability. Coproduction, which depicts the involvement of service users in public service provision (Brandsen & Honingh, 2016), also can be used to describe the relationship between the professionals of nonprofits and the local residents (McMullin, 2023). Disaster relief nonprofit organizations need to continuously conduct on-site learning from the community to improve their service provision, build connections with local residents, and encourage them to engage in prosocial behaviors. That is the reason why there is a relatively high correlation between learning capabilities and the performance of disaster relief nonprofit organizations in both service provision and social capital cultivation, although its impact on service provision is not statistically significant, maybe because of the small sample size.

Organizational features and the external environment both show their impact on the performance of disaster relief nonprofit organizations. Organizational age impacts nonprofits' performance in public value achievement. Younger organizations report higher levels of service provision and social capital cultivation, while older organizations perform well in public policy engagement. The result is inconsistent with existing literature, which indicates that older nonprofits show a higher level of performance on service provision and social capital cultivation but a lower level of political advocacy (Moulton & Eckerd, 2012). The potential explanation of the inconsistency is, on the one

hand, because disaster management is coordinated and dominated by local government, it is critical for disaster relief nonprofit organizations to make connections and work with government (Kapucu et al., 2010; Maroulis, 2017). Older organizations may have a higher chance to work closely with government because of their reputation, while the newest organizations face the problem of legitimacy since it is hard to establish working relationships with strangers (Hager, Galaskiewicz, and Larson, 2004). The close relationship between older nonprofits and local government can give these organizations more opportunities to engage in public policy processes. The practice also shows that older organizations, such as the American Red Cross, the Salvation Army, and the Catholic Charities, are important organizations in multiple states for ESF #6. On the other hand, with a good reputation, disaster relief nonprofit organizations may also have a higher expectation of their service provision and community engagement, which can lead to a relatively lower level of self-assessment about organizational performance. Another potential explanation is that in order to improve their legitimacy in the field to survive, newer disaster relief nonprofit organizations tend to be more effective in engaging in the community and providing service.

Additionally, the size of disaster relief nonprofit organizations significantly influences their performance in service provision and public policy engagement. Organizations with a higher level of operational budget can have more resources to promote their service provision, public policy engagement, and social capital cultivation. Previous literature also shows that nonprofits with a larger budget size have broader linkages with government and other nonprofit organizations (Guo & Acar, 2005), which can be beneficial for their performance.

Regarding the influence of the external environment, disaster nonprofit organizations who notice a relatively higher level of uncertainty tend to be more active in public policy engagement. The potential reason is that engaging in public policy processes and making connections with government can compensate for informational uncertainties (Meier & O'Toole, 2003). Thus, when perceiving a higher level of uncertainty, especially if the uncertainty is related to government policy, making connections with public officials to at least get related information or engaging in the public policy process to potentially reduce the uncertainty motivates organizations to be more active in public policy engagement. Interestingly, there is no significant difference in organizational performance between VOAD/COAD members and non-members. Considering the higher percentage of VOAD/COAD members in the responded organizations, the small sample size for non-VOAD/COAD members may be a potential reason for the insignificant results.

Merits of the Research

The research contributes to the discussion about nonprofit engagement in disaster management through indicating the contributions of disaster relief nonprofit organizations and examining the association between dynamic capabilities and public value achievement. The majority of research on disaster management follows the traditional approach to target the dominant role of government, while putting disaster relief nonprofit organizations in a marginal way in the network (Aldrich, 2008). Little research focuses on the operation and service provision of these organizations (e.g., Eller, Gerber & Branch, 2015; Gajewski et al., 2011), especially their adaptation efforts. This research first indicates that disaster relief nonprofit organizations not only provide

services but also promote community resilience through participating in public policy-making and cultivating community social capital. Additionally, the results suggest that organizational capabilities to adjust to the external environment, which refers to dynamic capabilities, variously shape the performance of disaster relief nonprofits in service provision, public policy engagement, and community social capital cultivation.

Adding a discussion on nonprofit performance by emphasizing nonprofit public value achievement and bringing dynamic capabilities into the conversation is another contribution of this research. The financial performance of nonprofit organizations has gained attention in the past years, and scholars have developed multiple associated indices, such as fundraising efficiency, fiscal performance, and administrative ratio (Ritchie & Kolodinsky, 2003; Coupet & Broussard, 2021), to evaluate the financial status of nonprofit organizations. However, the achievement of social mission is more critical for nonprofit organizations (Moore, 2003; Moulton & Eckerd, 2012), especially for disaster relief nonprofits who play an important role in supporting disaster survivors and vulnerable groups (Garcia et al., 2022; Chikoto-Schultz et al., 2019). Thus, this research focuses on public value achievement and examines capabilities that can significantly influence disaster relief service provision, public policy engagement, and social capital cultivation. Furthermore, instead of testing the operational capability of disaster relief nonprofit organizations, the study takes the environmental change of disaster relief nonprofits into consideration and explores the association between dynamic capabilities and nonprofit public value achievement. The results indicate that dynamic capability should not be neglected when discussing how to improve nonprofit performance.

Moreover, this research also serves as an opportunity to extend the conversation on dynamic capabilities through providing empirical evidence based on disaster relief nonprofits. First, there is limited research regarding the dynamic capabilities of nonprofit organizations (i.e., Costa et al.,2020; Kaltenbrunner & Reichel, 2018), even though climate change, COVID-19, and emerging new types of disasters require nonprofit, especially disaster relief nonprofit organizations, to adjust to the environment. The research examines the relationship between dynamic capabilities and public value achievement, specifically for disaster relief nonprofit organizations, which provides valuable empirical evidence to better understand the importance of dynamic capabilities in the nonprofit sector. Moreover, rather than regarding dynamic capabilities as a single capability with latent variables, as the majority of research has done (i.e., Costa et al.,2020; Peteraf et al., 2013), the analysis in this paper tests the influence of sensing, learning, integrating, and coordinating capabilities on organizational public value achievement, respectively. The result implies the potential relationship among these four types of dynamic capabilities. Some capabilities, such as sensing and learning, are positively related to the performance in public policy engagement and social capital cultivation while coordinating capability either negatively relates to or does not significantly impact the performance of disaster relief nonprofits.

Limitations and Future Research

Although the research shows its contributions from multiple perspectives, there are still limitations because of data accessibility. Even using a random sampling approach, the relatively small sample size impedes the representativeness of this research. For instance, the descriptive statistics show that more than 70% of responded disaster

relief nonprofits have been serving in the field for more than 9 years, which implies that some of the newest nonprofit organizations may not actively respond to this survey. Only capturing the dynamic capabilities and performance of mature nonprofits could cause biased results. However, as one of the limited research targeting the dynamic capabilities in the nonprofit sector, especially for disaster relief nonprofit organizations, it still provides valuable empirical evidence to both the topic of nonprofit engagement in disaster management and dynamic capabilities in the nonprofit sector. Additionally, one of the survey respondents is hired from the in-person conference rather than email, which may also cause a bias regarding the administration procedures. Furthermore, with a limited sample size, there are variables that are not included in the analysis. For instance, the survey data is collected in three different states, but the factor of geographical location is not included in the model. Because the level of uncertainty in external environments, as a relative comprehensive variable to reflect the external influence, has partly included the effect of state factors, such as state policy, economic influence, and social culture environment. Finally, this survey is only based on three states, which may show its limitation on generalization.

The above limitations of this research imply interesting topics for future research. Paying attention to small-size and newer nonprofit organizations and understanding the potential variation between small-size nonprofit organizations and large size in dynamic capabilities and its influence on organizational mission achievement would be an interesting topic. Furthermore, it is interesting to compare disaster relief nonprofit organizations in different states. Exploring how these organizations deliver their service and what influence government and policy change can have on these organizations would

be another valuable topic. Besides, this research only focuses on disaster relief nonprofits. It would be worthwhile to explore if dynamic capabilities also influence the performance of other types of nonprofit organizations, such as nonprofits on advocacy or arts.

Conclusion

This chapter explores the association between dynamic capabilities and the performance of disaster relief nonprofit organizations in service provision, public policy engagement, and community social capital cultivation. The results of the linear modules show that sensing, learning, integrating, and coordinating capabilities impact organizational performance variously. Sensing capability and learning capability matter for public policy engagement and social capital cultivation, respectively. While integrating capability impacts both the service provision and the public policy engagement practice. Coordinating capability also shows a negative association with the performance of service provision in disaster relief nonprofits. The findings contribute to current discussions about disaster relief nonprofit adaptations and performance, which also implies that the managers of disaster relief nonprofit organizations should pay attention to different capability cultivation based on their mission and priorities.

CHAPTER 7

DYNAMIC CAPABILITIES AND THE PERFORMANCE OF DISASTER RELIEF NONPROFITS: AT THE NETWORK LEVEL

This chapter first explores the differences in organizational dynamic capabilities, characteristics, and external environment between VOAD/COAD members and non-members and answers the question of whether these factors can also shape organizational performance at the network level.

Variation Between VOAD/COAD Members and Non-members

The results of the Mann-Whitney U Test (see Table 11 in Chapter 4) show that dynamic capabilities, organizational characteristics, and external environment vary between VOAD/COAD members and non-members. First, the result indicates that the learning capability of VOAD members is significantly higher than non-VOAD members ($z=-1.74, p<0.05$). Hypothesis 4b is supported. While the rest of the dynamic capabilities, including sensing, integrating, and coordinating capabilities, do not show significant differences between the two groups. Interestingly, the mean values show that VOAD/COAD members, on average, have a higher level of sensing, learning, and coordinating capabilities but have a lower integrating capability, compared with the non-VOAD/COAD members. Regarding organizational characteristics, the VOAD/COAD members tend to recognize disaster relief as an important and prioritized mission ($z=-2.85, p<0.01$), while non-VOAD/COAD members do not weigh disaster relief service provision as important as VOAD members even though they do support disaster management through service provision. There is also a significant difference in organizational size between VOAD/COAD members and non-members ($z = -1.91,$

$p < 0.05$). The average amount of operational expenses of VOAD/COAD members is about \$572k (ln 6.35), while the mean value for non-VOAD/COAD member is around \$130k (ln 4.87), which represent that VOAD/COAD network includes many medium- to large-size disaster relief nonprofit organizations but may miss small disaster relief nonprofit organizations. The tests about the uncertainty of internal and external environment also suggest significant differences. On the one hand, internally, the VOAD/COAD members experienced more leadership changes in the past 5 years ($z = -2.72, p < 0.01$). On the other hand, there is a significant variation in the perceived influence of climate change between VOAD and non-VOAD members ($z = -2.16, p < 0.05$). VOAD members, on average, notice that climate change can influence disaster relief nonprofits, while non-VOAD members tend to assess the influence lower.

VOAD/COAD Network Benefits

The analysis of 31 interviews from the managers of disaster relief nonprofit organizations yields three codes, volunteer support, finance benefits, and reputation improvement, to illustrate the benefits gained from the VOAD/COAD network.

Volunteer Support

Volunteer recruitment and retention are critical for the service provision of disaster relief nonprofit organizations since many of them are volunteer-based (Rotolo & Berg, 2011). Different from other services provided by nonprofits in general situations, providing disaster relief services, especially mass care, is strongly impacted by the frequency of disasters. In the season with limited disasters, the challenge of hiring and maintaining volunteers would be demanding, especially for those nonprofits that only provide disaster relief services. As one of the interviewees mentioned,

I will say it can be difficult sometimes with our landscape here in [Anonymized State], we're not as disaster-prone, per se, we're kind of landlocked, ...it always appears important to me to keep people engaged however you can, and to really keep that communication (Interviewee 9, Pos. 41).

Another interviewee specifically said, "*It is difficult to keep volunteers engaged if you don't have something (to engage) (Interviewee 4, Pos. 188).*" The advantage of participating in the VOAD/COAD network is that it provides opportunities for the organizations and their volunteers to engage in disaster drills, exercises, or seminars organized either by the VOAD/COAD or by the local government. An organization that is a member of both VOAD and COAD indicates that

I have grown to appreciate greatly the connections, the networking that's involved in VOAD and COAD and the opportunities that afford us to be able to respond to disasters... with COAD and VOAD exercises, that's a way to keep our people involved and practice their skills and things (Interviewee 4, Pos. 188).

Likewise, one of the board members of VOAD/COAD mentioned that they organize multiple workshops and seminars to maintain the engagement of organizations and volunteers,

what we do to keep everyone engaged is we meet quarterly and provide different types of trainings. So, we have like active shooter, we have one coming up that information about the legal side after disaster...we're prepared but also to keep everyone engaged and keep everyone together (Interviewee 28, Pos. 32) .

Recruiting volunteers with the help of other member organizations is another important benefit of being a member of the VOAD/COAD network. For instance, the interviewee mentioned,

With the floods that happened three years ago in [Anonymized County], some of the VOAD organizations were providing volunteers, but they still needed more. And so, they came to us while we were able to run reports in our system with zip codes of volunteers who live in that area, or at least (volunteers in our system) who have said I would like to support in disaster response (Interviewee 9, Pos. 70).

Also, in order to recruit enough volunteers for distributing PPE during the COVID, a VOAD/COAD member requested help from other member organizations,

For PPE distribution, especially during the time when things were kind of locked down ... We used [Anonymized Organization] (for volunteer recruitment). And at that time, we were like the only in-person volunteer event that they were posting (Interviewee 12, Pos. 62).

Financial Opportunities

The common approach for VOAD/COAD members to get financial benefits from the network is through sharing information about potential funding or grant opportunities. Based on the information collected in the VOAD/COAD meetings, the member organizations can build partnerships and start joint programs, which would be helpful for their financial sustainability and mission achievement. For example, one of the VOAD members mentioned that

[Anonymized State]VOAD has been a great resource for us...that's how we've always been able to find a large portion of our partners. I would say about 70% of our partners are from the [Anonymized State] VOAD (Interviewee 26, Pos. 205). They get grants from other VOAD members as they engage in the recovery.

So some of the things that we're seeing with our partners is, for example, with Irma, we were able to get grants from other organizations... we were able to work with [Anonymized Organization]...they were able to give us some grants to replace someone's mobile home, trapping grants and things like that (Interviewee 26, Pos. 58).

In addition to getting grants and collaboratively working on joint programs, some VOAD/COAD members also save their service provision costs through participating in the network and getting support from other VOAD/COAD members. For example, during COVID-19, one VOAD/COAD member distributes their PPE source through shipping. Being a member of VOAD/COAD network enables them to get benefits using UPS, “We're active in our VOAD and COAD. UPS is a huge sponsor of National VOAD, they always give some of their bigger partners tickets, like (in) the National Conference (Interviewee 12, Pos. 86) .” Additionally, sharing valuable resources, such as trucks and transportation support, also reduces the financial pressure of disaster relief nonprofit organizations in providing service. An interviewee mentioned her efforts in supporting other members,

I've used my transportation to move things from [Anonymized City] up to [Anonymized City] for other organizations before because they had supplies and during COVID, especially, you know, PPE and those types of things, we can use

our trucks that are going places anyway to move some of that. So, our transportation resources can sometimes be really helpful (Interviewee 3, Pos. 48).

Reputation Improvement

Using the platform to improve visibility and reputation is also a common benefit for VOAD/COAD members. Being recognized within the field will allow nonprofits to get more service requests from government and other nonprofit organizations. For instance, one of the managers mentioned,

I'm on the state VOAD board, and I chaired our county COAD. I do a lot of training myself, and I love meeting people and trying to make connections in that realm. Like, the more our name has gotten out there, the more we're requested (Interviewee 1, Pos. 22).

Additionally, the network would be helpful for disaster relief nonprofits to extend their service provision in non-disaster seasons. For instance, an interviewee focusing on tool provision states that,

Because there are other organizations that are like us, and that they don't only do disaster. For some of them, they borrow now for other things, maybe for like their fundraising or something like that. That isn't necessarily related to disaster. But they maybe wouldn't have known about us if we didn't participate in the VOAD and COAD (Interviewee 12, Pos. 46).

Although multiple interviewees mentioned that they get benefits from the VOAD/COAD network, some members also indicated that they do not think their engagement in the network brings benefits to organizations. One of the interviewees

mentioned that the VOAD/COAD network is not helpful for the COVID response of member organizations since

During COVID response, there was like a lag of activity of the State VOAD. The new leadership was not quite sure what to do with this pandemic. And how they could pull the organizations together to share resources (Interviewee 30, Pos. 79). Another interviewee also mentioned that “I wouldn’t say that it (VOAD) helps [Anonymized Member Organization]with anything. It’s kind of the opposite, we’re here to help them. I mean, realistically, like, we’re here to help provide those services for the community (Interviewee 5, Pos. 122).” The variation of the perceived benefits associated with participating in the VOAD/COAD network implies the necessity to understand why there is such a different perception regarding the function of the VOAD/COAD network.

Dynamic Capabilities and Acquired Benefits from VOAD/COAD

Four models are built on understanding the relationship between dynamic capabilities and multiple types of network benefits (see Table 14). The result of Model 1 shows that the capability of the VOAD members matters. A higher level of organizational learning capability enables organizations to get more volunteer support from the VOAD/COAD network ($\beta = 0.44$, $p < 0.01$), while the sensing, integrating, and coordinating capabilities do not significantly impact the acquired volunteer benefits. Additionally, network capability, which refers to the active level of the network itself, impacts the benefits of volunteer support. There is a positive relationship between network capability and the benefits of volunteer support provided by the VOAD/COAD ($\beta = 0.49$, $p < 0.001$). Disaster relief nonprofits who are engaged in a more active VOAD/COAD network can acquire more support for volunteer recruitment and retention.

A unit increase in network capability is associated with a 0.49 increase in the benefits gained from volunteer support.

The model about financial benefits indicates that learning capability and network capability can both influence the financial opportunities of disaster relief nonprofits. Nonprofits with a higher level of learning capability ($\beta = 0.40, p < 0.01$) and engage in a more active VOAD/COAD ($\beta = 0.25, p < 0.05$) can get more benefits related to financial opportunities. A unit of increase in learning capability enables the nonprofits to gain around 0.4 units of increase in financial support through the shared information and partnerships built based on the network. Additionally, network embeddedness, which is represented by the engagement level of individual organizations, can affect the acquired financial opportunities. The disaster relief nonprofits who are more engaged in the VOAD/COAD gain more benefits regarding financial resources ($\beta = 0.37, p < 0.01$).

Enhancing reputation is also an important benefit for disaster relief nonprofit organizations because the majority of them rely on charitable giving and volunteers to survive and achieve their mission. Model 3 shows that both network capability and the embeddedness level of the VOAD/COAD members determine their perceived benefits from the network regarding reputation enhancement. An active VOAD/COAD network can better help the members build their reputation ($\beta = 0.35, p < 0.05$), and those members who are deeply involved in the network can considerably improve their reputation ($\beta = 0.34, p < 0.05$). However, the influence of dynamic capabilities, including sensing, learning, integrating, and coordinating, on the benefit of reputation improvement is not statistically significant. Hypothesis 4c fails.

The total benefits, including volunteer support, financial opportunities, and reputation improvement, of the VOAD/COAD network are also examined. The analysis indicates that learning capability is positively related to the total benefits of individual organizations. Those members with a higher level of learning capability can acquire more benefits from the VOAD/COAD network ($\beta = 0.38, p < 0.01$). Also, deeply engaging ($\beta = 0.30, p < 0.01$) in an active VOAD/COAD ($\beta = 0.38, p < 0.01$) can help nonprofit organizations get more support. A unit increase in embeddedness level is associated with an additional 0.3 unit increase in benefits for reputation improvement.

Table 14. Dynamic Capabilities and Network Benefits (N=66)

Effect	Volunteer Support		Financial Opportunity		Legitimacy		Total Benefits	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	-1.94***	0.39	-1.37**	0.52	-0.56	0.57	-1.57**	0.43
Dynamic Capabilities								
Sensing	-0.09	0.16	0.07	0.17	0.24	0.20	0.06	0.15
Learning	0.44**	0.14	0.40**	0.15	0.01	0.19	0.38**	0.13
Integrating	0.05	0.12	-0.15	0.12	-0.14	0.12	-0.10	0.11
Coordinating	0.11	0.13	0.01	0.16	0.02	0.15	0.05	0.14
Network (VOAD/COAD)								
Feature								
Network Capability	0.49***	0.12	0.25*	0.13	0.35*	0.17	0.38**	0.12
VOAD member	0.13	0.18	0.08	0.17	0.03	0.20	0.10	0.16
Nonprofit Feature								
Engagement Level	0.06	0.10	0.37**	0.12	0.34*	0.16	0.30**	0.11
Size	-0.10	0.11	-0.11	0.13	-0.19	0.14	-0.13	0.11
ModelFit								
AIC	303.13		289.99		332.86		271.22	
BIC	325.02		311.89		354.75		293.12	
R ²	0.57		0.55		0.46		0.63	

* $p < .05$, ** $p < .01$, *** $p < .001$; One-tailed tests.

Interestingly, the four models consistently show that network capability significantly influences the provided benefits to member organizations. The network embeddedness of disaster relief nonprofits also can explain the variation of acquired benefits among the VOAD/COAD members in financial opportunities and reputation improvement. At the same time, different types of dynamic capabilities shape the benefits diversely. Learning capability positively impacts volunteer support, financial resources, and total benefits but does not show significance in reputation improvement. Sensing, integrating, and coordinating capabilities do not strongly impact the experience of individual organizations in the VOAD/COAD network. Additionally, there is no significant difference in the benefits between participating in the VOAD and COAD networks.

Discussion

Intra- and inter- sectors collaborations are frequently utilized in the field of disaster management (Kapucu & Hu, 2020; McGuire & Silvia, 2010). The request for disaster relief services is often systematic and comprehensive, which implies that it is hard for a single nonprofit organization to cover the needs of disaster survivors. Although motivations, challenges, and approaches for disaster relief nonprofit organizations to engage in networks and collaborate with government, companies, and other nonprofit organizations have been widely discussed (i.e., Simo & Bies, 2007; Demiroz & Kapucu, 2015), little research explores the variations between network members and non-members, especially understanding the question of why some nonprofit organizations can get benefits from a network while others cannot.

The direct aim for nonprofit organizations to participate in a network is for valuable resources, which can help them maintain their organization and enhance service provision (Guo & Acar, 2005). The neo-institutional theory implies that organizational capabilities for adaptation can partly explain the variation. As a platform for information sharing and knowledge diffusion (Monge & Contractor, 2003; Kapucu et al., 2010), networks can be more beneficial for organizations with a higher level of adaptive capabilities since these abilities enable them to learn from other members, better embedded in the network, and ultimately get benefits. Applying the theory of dynamic capabilities and using the VOAD/COAD network as an example, this research first explores the difference between VOAD/COAD members and non-members and answers the question of whether organizational capabilities in adjusting to the environment matter for their acquired benefits at the network level. The impact of network capability, network embeddedness, and organizational characteristics are also included in the models.

Overview of the Findings

The results show that dynamic capabilities, specifically the learning capability, positively influence volunteer support, financial opportunities, and the total benefits that member organizations can acquire from the VOAD/COAD network while sensing, integrating, and coordinating capabilities do not show their significance. On the one hand, the finding is consistent with the previous discussion about organizational learning capability. As the second-order dynamic capability, learning capability is positively related to the participation in networks and the performance of individual organizations at the network level (Carley & Harrald, 1997; Kong and Farrell, 2010). With a higher level

of learning capabilities, disaster relief nonprofit organizations can absorb the knowledge and information, such as volunteer hiring and financial opportunities, shared from other member organizations and apply the information to organizational operations. The potential reason why learning capability does not impact the benefits of reputation is that reputation improvement is based on the recognition and trust of other nonprofits. It cannot be determined directly by organizational capability but by the recognition of other organizations. Another potential explanation is that since many VOAD/COAD members have been in the field for more than 9 years based on the survey, they are already well-known and highly recognized in the field. It is hard to significantly improve their reputation through the VOAD/COAD network. On the other hand, sensing, integrating, and coordinating capabilities do not show their significance in impacting the acquired benefits of VOAD/COAD members from the network. The potential explanation is that these organizations already participated in the network. Their variations in sensing capability would be relatively small, which can cause an insignificant relationship. While the coefficient shows that there could be a negative association between integrating capability and organizational benefits. The potential reason is that network engagement is a practice of building external relationships with government and other nonprofits (Johansen & LeRoux, 2012), while integrating emphasizes the involvement of staff, volunteers, and employees in decision making, and coordinating capability focusing on the redistribution of organizational resources. They emphasize internal management, which may not directly influence the acquisition of valuable information about volunteer and financial opportunities from the external network.

Network capability, which is measured by the active level of the VOAD/COAD network, and network embeddedness, reflected by the perceived active engagement of individual organizations, can impact the benefits of the network. The capability of the VOAD/COAD network is positively associated with member benefits in volunteer support, financial information, reputation improvement, and total benefits of disaster relief nonprofit organizations. Previous research also gets consistent results. For instance, Romzek and coauthors (2014) find that with frequent interactions, network participants are more likely to share resources and improve network accountability. Actively participating in formal meetings can promote network performance in receiving grant funding (Valero & Jang, 2020). At the same time, the engagement level of individual organizations, which refers to network embeddedness, can also promote the potential benefits acquired from the network, as previous literature indicated (Zheng, Zhang & Du, 2011). Although organizational size does not significantly influence organizational benefits, the negative coefficients imply that organizations with relatively less operational budgets may get more benefits from the network.

Merits of the Research

This research facilitates the discussion about disaster relief nonprofit organizations by exploring the differences between VOAD/COAD members and the benefits of engaging in the VOAD/COAD network. Although VOAD/COAD plays an important role in promoting communication, coordination, collaboration, and cooperation, many disaster relief nonprofit organizations are not engaged in the network as formal members. Understanding the difference between VOAD/COAD members can help to depict the profile of the VOAD/COAD network. The analysis in this paper shows

that VOAD members regard disaster relief as a priority in their organization, and their organizations are medium to large size. These members are also associated with a higher level of learning capability and report their attention to climate change. On the one hand, the results imply that the VOAD/COAD network shows limitations in inclusion and diversity. Specifically, small-size nonprofit organizations, such as community-based organizations with limited operational budgets and nonprofits who do not prioritize disaster relief services but still engage, are not well-included in the network. As a single point of contact between government and disaster relief nonprofit organizations, the deficiency may impede the function of the VOAD/COAD network and the effectiveness of disaster management. On the other hand, since VOAD members tend to recognize the influence of climate change, the network may play an important role in educating individual nonprofit organizations about preparedness and mitigation for the climate crisis.

The research also adds conversation about why disaster relief nonprofit organizations make substantially different assessments about their experiences and benefits of being a member of the VOAD/COAD network. Exploring the motivation and benefits for disaster relief nonprofit organizations to engage in a network has gained attention from previous literature (Svare & Gausdal, 2017). What has been neglected is why some VOAD/COAD members get benefits from participating in the network while others do not. This research examines the antecedents, specifically dynamic capabilities, network embeddedness, and network capability, of benefit acquisition from the VOAD/COAD network. A higher level of learning capability can help member organizations gain valuable information regarding volunteer support and financial

opportunities. The engagement level of individual organizations can also explain the benefit variation among VOAD/COAD members. Disaster relief nonprofit organizations that are more actively engaged, for instance, being a board member or attending general meetings more frequently, are available for more information to improve their organizational performance and sustainability. In addition to organizational capability and features, the network capability is critical in impacting the available resources within the network and ultimately influences the benefits for VOAD/COAD members. Engaging in a more active network would be helpful for individual organizations.

This research also contributes to the theory of dynamic capabilities by exploring its impact at the network level. Empirical evidence has shown that dynamic capabilities can influence competitive advantage and organizational performance in the private sector and public sector (Trivellateo, Martini & Cavenago, 2021; Piening, 2013). However, limited research is based on the case of nonprofit sectors (i.e., Costa et al., 2020), although the nonprofit sector shows its distinctive features compared with the other two sectors (Goulet & Frank, 2002; Helmig et al., 2014). Furthermore, the influence of dynamic capabilities on organizational network engagement and their acquired benefits from a network is still a puzzle. Some scholars use the case from the for-private sector to examine how firms' dynamic capabilities can promote the performance of network performance in building strategic alliances and diffuse ideas (Rothaermel & Hess, 2007). Instead of focusing on network performance, this research pays attention to the direct impact of engaging in a network on individual organizations and suggests that learning capability can help organizations acquire more volunteer support and financial opportunities. Also, through exploring the influence of sensing, learning, integrating, and

coordinating capabilities, respectively, this research also indicates that not all types of dynamic capabilities influence the experience of member organizations in the VOAD network. Sensing, integrating, and coordinating capability does not significantly help organizations attain valuable information.

Providing implications to the manager of VOAD/COAD and the disaster relief nonprofit organizations is another contribution of this research. As mentioned above, it is necessary for VOAD/COAD to be more inclusive. For instance, VOAD/COAD managers need to involve small-size nonprofit organizations and those organizations that do not only provide disaster relief services. The improvement of inclusion would make information sharing more convenient, especially when there is an ongoing disaster. Maintaining the capability and the interaction among participants through organizing drills, workshops, training, and seminars to keep the network active and sustainable is another implication for VOAD/COAD managers and board members. Additionally, the suggestion for disaster relief managers is that in order to get benefits from network engagement, it is necessary to improve the learning capability, especially for inter-organizational learning. Learning capability, which is regarded as the second level of dynamic capabilities (Wang & Ahmed, 2007), impacts organizational performance at the network level. Other types of capabilities are not as vital as learning capability.

Limitations and Future Research

While the research demonstrates its contributions across various aspects, limitations persist due to data accessibility. First, the 66 responded organizations for the online survey are relatively small, and these samples are from three states, which may weaken the representativeness and the capability of generalization for this paper. But by

using random sampling and selecting disaster relief nonprofit organizations from multiple approaches, the results of this paper can still provide valuable empirical evidence about both the difference between VOAD/COAD members and non-members and the impact of dynamic capabilities, network embeddedness, and network capability on benefits acquisition of individual organizations. Moreover, although VOAD/COAD networks in different states show some commonalities, there are lots of differences at the network level. For instance, VOAD in New Jersey has full-time employees and operates as a formal nonprofit organization, while VOAD in Arizona and Florida relies on active member organizations to take leadership responsibility. The variance between the full-time operational system and the voluntary system may significantly impact the effectiveness of the network and the potential resources it can bring to the member organizations. Also, considering the limited sample size, only the network capability, which is measured by the perceived active level of the network, is applied to indicate the difference in network features. A more comprehensive evaluation of network capability and structure would be helpful. Also, there are multiple disaster relief nonprofit organizations that are both VOAD and COAD members. They answer both questions about the network benefits of the VOAD and the affiliated COAD. In the analysis, these organizations are regarded as two separate records, and the variable of VOAD/COAD status reflects whether the answer is for VOAD or for COAD. This approach may cause a problem of independence assumption for the multiple linear regression. But, since the sampling process is independent, and the related questions are also independent for the two records, it is still a reasonable choice.

The limitations inherent in this research suggest potential topics for future study. It is essential to evaluate the VOAD/COAD network capability and performance in a more comprehensive way. For instance, exploring the variations of VOAD/COAD network structures and the role of this network in the state or county-level emergency management system would be an interesting topic. Furthermore, testing the measurements of dynamic capabilities in the nonprofit sector using confirmatory factor analysis and exploring the impact of dynamic capabilities, overall, on organizational benefits from a network can be another valuable analysis. Additionally, it is interesting to conduct in-depth interviews and explore why some disaster relief nonprofit organizations decide not to participate in the VOAD/COAD network, what the drawbacks are and how they perceive the role of VOAD/COAD in disaster management. There are also different types of networks that provide opportunities for disaster relief nonprofit organizations to build partnerships with private companies or multiple levels of government. Thus, it is an interesting topic to compare different networks in the field of disaster management and understand whether dynamic capabilities also impact organizational behavior in network engagement and collaboration. Finally, this research only explores whether or not VOAD/COAD provides valuable resources, such as information about grants and opportunities for joint programs, to the member organizations. It does not follow the procedures of how these organizations use the information to organize their operation and service provision. It would be meaningful to follow the process of partnership building and collaboration starting from a network.

Conclusion

This chapter examines the influence of dynamic capabilities on the network engagement of disaster relief nonprofit organizations. The result shows that compared with the non-VOAD/COAD members, VOAD/COAD members tend to have a higher amount of operational budget and perceive climate change as an important factor in organizational adaptation. The members of the VOAD/COAD network hold different attitudes towards the VOAD/COAD network. While some of the members report limited benefits from the VOAD/COAD network, most of the member organizations mentioned their positive experiences in the VOAD/COAD network and recognized their benefits as volunteer support, financial opportunities, and reputation improvement. Learning capability partly explains the variations of gain benefits among the VOAD/COAD members. At the same time, the active level of the network itself and the engagement of individual organizations matter for the outcome of VOAD/COAD participation. This chapter contributes to current literature about network engagement of disaster relief nonprofit organizations and applies the theory of dynamic capabilities at the network level. The result also provides implications for disaster relief nonprofit managers. In order to get resources from the VOAD/COAD network, it is necessary to actively engage in the network and promote the network's capability.

CHAPTER 8

DISCUSSION AND CONCLUSION

Rationale and Dissertation Structure

Past years have witnessed a notable rise in the occurrence of disasters and the subsequent losses. Government limitations because of bureaucratic myopia, inertia, and waste led to ineffective pre-deployment of emergency supplies and post-disaster response (Shughart, 2006). The whole-community approach is initiated to engage disaster relief nonprofit organizations in the process of disaster management. Although there is a consensus that disaster relief nonprofits play an important role as service providers and significantly improve the effectiveness of disaster management (Palomo-Gonzalez & Rahm, 2008; Shaw & Izumi, 2014), the changing environment, such as COVID-19, the increasing demands from service recipients, and the competition with other organizations, also exerts significant pressure on disaster relief nonprofit organizations to adjust to the environment and maintain their performance of public service achievement (i.e., Maher, Hindery & Hoang, 2020; Botetzagias & Koutiva, 2014; Choi, 2016).

Exploring the adaptation of disaster relief nonprofit organizations in changing environments, thus, is a critical topic. Current literature focuses on answering the question of what adaptations nonprofit organizations have taken and why they make adaptations based on multiple theories, such as the organizational ecology theory, the neo-institutional theory, and resource dependence theory (Hager, Galaskiewicz & Larson, 2004; Mosley, Maronick & Katz, 2012; Chen, 2014). Little research pays attention to the procedures of conducting adaptations in disaster relief nonprofits and the capabilities that support these organizations to successfully adjust to the environment. Most importantly,

disaster relief nonprofit organizations, which are unique in their mission, working environment, and collaboration level, are always out of the center for current discussion both in the field of emergency management and nonprofit management.

To better understand how disaster relief nonprofit organizations make adaptations and what capabilities support the adaptation, this research first depicts the engagement of disaster relief nonprofit organizations based on the official national frameworks and state-level emergency operational plans. After clarifying the role and adaptive behaviors of disaster relief nonprofits, this research uses the theory of dynamic capabilities, which illustrates the abilities that can help organizations to adjust to the environment (Teece, 2007), and utilizes both interview and survey data collected in New Jersey, Florida, and Arizona, to answer three key questions: 1) How does disaster relief nonprofit organizations apply their dynamic capabilities to make adaptations? 2) Do the dynamic capabilities, including sensing, learning, integrating, and coordinating, ultimately influence the performance of disaster relief nonprofit organizations in service provision, public policy engagement, and community social capital cultivation? 3) Using the VOAD/COAD network as an example, are there disparities in dynamic capabilities between VOAD/COAD members and non-members, and can these differences partially explain the variations in benefits acquisition among VOAD/COAD members?

These three research questions target different perspectives about the adaptation of disaster relief nonprofit organizations and the importance of adaptive capabilities, which is defined as dynamic capabilities, in maintaining the performance of disaster relief nonprofits at both the organizational and network level. Furthermore, this research, as a whole, pays attention to the interaction between the external environment and the

internal capability of disaster relief nonprofit organizations. The changing of the external environment asks nonprofits to proactively build and use dynamic capabilities to find potential opportunities, learn from the environment, and take action to adjust to the environment. Additionally, considering the common practice of collaboration in the field of disaster management, this research pays attention to the relationship between organizational adaptation and network engagement by comparing organizational capabilities and experience of VOAD/COAD members and non-members.

Overview of Findings

Using in-depth interviews with the managers of disaster relief nonprofit organizations in three states and applying the theory of dynamic capabilities, this research first indicates the formal involvement of disaster relief nonprofit organizations in emergency management based on both national frameworks and state emergency management plans. The exploration regarding disaster relief nonprofits' engagement shows that these organizations pay attention to multiple stages of emergency management, especially in disaster response and recovery. The primary services that disaster relief nonprofits provide fill into the ESF #6 Mass care, Emergency Assistance, Temporary Housing, and Human Services, but their services are broader than that. Some disaster relief nonprofit organizations play vital roles in transportation, communication, information and planning, logistics, public health and medical services, search and rescue, pre-disaster education, and rights protection. With different needs and public policies, the role of disaster relief nonprofits in emergency management shows substantial differences among states. Taking VOAD as an example, Arizona VOAD is recognized as a supportive organization for multiple ESFs, including ESF#6 Mass Care,

ESF#7 Logistics, ESF#8 Public Health and Medical Services, and ESF#14 Recovery. New Jersey VOAD primarily takes the supportive function for ESF#6 Mass Care. Florida VOAD is not a supporting organization for any of the ESFs.

This research also illustrates the adaptations in disaster relief nonprofit organizations before understanding the procedures of conducting adaptations and the influence on organizational performance. The result shows that most disaster relief nonprofit organizations have adapted their internal management, service provision, service scales, and collaborations to better adjust to the changing environment. The most common adaptive action is to build new collaborative agreements, although some organizations tend to reduce their efforts in developing collaborations and partnerships in a changing environment. Many disaster relief nonprofit organizations also expand their disaster relief programs and modify volunteer or staff management. Interestingly, some disaster relief nonprofit organizations make no adaptation in a changing environment, although they only account for a small portion of the respondents.

After providing the general picture of nonprofit engagement in emergency management and the adaptations these organizations have made, this research further depicts the adaptive strategies of disaster relief nonprofit organizations in their sensing, learning, integrating, and coordinating steps. National guidance and signals, interpersonal connections and networking, systematic community assessments, and past service provision challenges offer avenues for disaster relief nonprofit organizations to sense the need for adaptation. Organizations can employ on-site observations, peer learning, and structured training programs in terms of learning strategies. The approach to reaching a consensus on adaptation within the disaster relief nonprofits, which is the integrating

stage, can either be a top-down directive from leaders to employees and volunteers or a bottom-up initiative starting with frontline employees and progressing to organizational leadership. The coordination stage often entails reallocating current resources and leveraging collaboration channels with other partners. Most interestingly, different from the linear approach of conducting adaptations in the for-profit sector, the procedure of adaptations in disaster relief nonprofit organizations shows rhizomatic characteristics. The four stages, sensing, learning, integrating, and coordinating, implied by the theory of dynamic capabilities, demonstrate their interactions through strategic connectivity, temporal simultaneity, and directional flexibility.

Following the in-depth analysis of the adaptation process within disaster relief nonprofits, this study further investigates whether or not dynamic capabilities can directly shape the performance of these nonprofit organizations dedicated to disaster relief efforts.

At the organizational level, the results of the multiple linear regression suggest that dynamic capabilities, including sensing, learning, integrating, and coordinating, impact the performance of disaster relief nonprofits, although their influence on service provision, public policy engagement, and social capital cultivation vary. Specifically, integrating and coordinating capabilities can significantly impact the efficiency and effectiveness of service provision, which is consistent with existing literature (Daniel & Wilson, 2003; Zahoor & Gerged, 2021; Machado et al., 2020) while implies the potential conflict between general operation and organizational implementation for change, as previous literature pointed out (Mellert et al., 2015). Sensing and integrating capability shape nonprofits' engagement level in disaster-related public policy making, and learning capability is associated with the performance of social capital cultivation, supporting the

current discussion about dynamic capabilities and organizational performance (McMullin, 2023; Fyall, 2016).

Regarding the network level, a brief comparison of dynamic capabilities, organizational characteristics, and external environments has been conducted between VOAD/COAD members and non-members. The results suggest that VOAD/COAD members, on average, tend to prioritize disaster relief service, experience frequent leadership change, and recognize the influence of climate change. Compared with the non-VOAD/COAD members, they also have a higher level of learning capabilities and the amount of operational budget. Using the interview data from the VOAD/COAD member organizations, this research categorizes the benefits provided by the network as volunteer support, financial opportunities, and reputation improvement. Multiple linear regression is then applied to understand the association between dynamic capabilities and the benefits gained from the VOAD/COAD network among members. Learning capability presents its significant influence. Member organizations who report a higher level of learning capability also get more support regarding volunteer and finance, while it is not statistically significant in affecting organizational reputation, which is partly consistent with current discussion (Kong and Farrell, 2010; Carley & Harrald, 1997). Additionally, network capability and the embeddedness of individual organizations positively help organizations to get support from the network in multiple perspectives, such as volunteer management, financial opportunities, and reputation improvement. These findings are also supported by evidence from other sectors (Valero & Jang, 2020; Zheng, Zhang & Du, 2011).

Theoretical Contributions

This research advances knowledge about disaster relief nonprofit organizations by revealing their adaptative behaviors and underlying capabilities. Unlike current research that often sidelines disaster relief nonprofit organizations (Aldrich, 2008), this study places a spotlight on the actions of these nonprofits, particularly their efforts in making adaptations and the corresponding influence on their performance. There is an agreement that disaster relief nonprofit organizations play an important role in multiple phases of disaster management because of their advantages in engaging in local communities (Demiroz & Hu, 2014). Consequently, the performance of these organizations, including their service delivery, involvement in public policy, and community engagement, can significantly influence the effectiveness of disaster management, either positively or negatively. Therefore, it becomes essential to understand the factors that can shape the performance of disaster relief nonprofit organizations. Although there are tons of discussions regarding the performance of nonprofit organizations (i.e., Ritchie & Kolodinsky, 2003; Coupet & Broussard, 2021; Berrett & Holliday, 2018), limited research is aware of nonprofits that address disaster relief service provision, not mentioning exploring their practice in conducting adaptation and adjusting to the environment. This research focuses on disaster relief nonprofit organizations, paying attention to their special status under the background of climate change, COVID-19, and the normality of disasters, and indicates that dynamic capabilities can significantly shape organizational performance. The result indicates that disaster relief nonprofits actively engage in pre-disaster preparedness and post-disaster response and recovery. In order to promote their performance, nonprofits have conducted multiple adaptive actions in internal management, service provision, and collaborative relationships to maintain their

service provision. The dynamic capabilities that support their organizational adaptations also influence the performance of these organizations.

The research also contributes to the literature about nonprofit management through providing valuable empirical evidence about organizational adaptations. Current discussions about adaptation are mainly based on the for-profit sector and provide evidence about the types of adaptations as well as the motivations (i.e., Hager, Galaskiewicz, and Larson, 2004; Chen, 2021). This research, exceptionally, investigates how nonprofit organizations make adaptations and what are the influences of the related capabilities. Additionally, dynamic capabilities, which has widely applied in the for-profit sector to understand organizational comparative advantage and performance (Peteraf et al., 2013; Trivellateo, Martini & Cavenago, 2021; Wang & Ahmed, 2007), provide a comprehensive framework to understand the valuable capabilities supporting organizational adaptations. Applying the concept to the field of the nonprofit sector and using disaster relief nonprofit organizations as a case to provide empirical evidence advances the theoretical discussion about the antecedents and the outcomes of nonprofit adaptations.

Also, this research assesses the public value achievement of disaster relief nonprofits, including service provision, public policy engagement, and social capital cultivation. These three perspectives are especially vital for disaster relief nonprofit organizations. Providing disaster relief service is the direct and primary role, as previous literature has noticed (i.e., Eller, Gerber & Branch, 2015). However, when working in a disaster scenario, which is predominantly managed and coordinated by government (Curtis, 2015), it is necessary for disaster relief nonprofits to make connections with

public officials and advocate for communities and vulnerable groups. Also, disaster management, both the pre-disaster risk reduction and the post-disaster response, is community-based. Thus, measuring the performance of disaster relief nonprofit organizations in promoting neighborhood mutual support and civil engagement and educating them for collaboration is critical. Additionally, considering the uniqueness of disaster settings and the active network engagement of disaster relief nonprofits, this research not only measures the performance at the organizational level but also at the network level. The direct motivation for nonprofits to engage in a network is to get valuable resources for their service provision and organizational development (Guo & Acar, 2005). Thus, this research defines network performance from the perspective of individual organizations and explores their assessment of to what extent this network can help their operation.

Adding discussion about the whole-community approach to disaster management is another contribution of this study. The whole-community approach emphasizes the importance of nonprofit engagement in disaster management. However, limited research targets the behavior of disaster relief nonprofit organizations. This research first indicates that disaster relief nonprofit organizations can contribute to disaster management through multiple ways, such as service provision, public policy engagement, and community social capital cultivation, which are the keys to improving the effectiveness of disaster management. The results also shed light on how to improve the operation of disaster management through maintaining the capability of disaster relief nonprofits. Increasing the sensing and learning capabilities while paying attention to balance integrating and coordinating capabilities can promote the engagement and performance of disaster relief

nonprofits, which ultimately can be beneficial for community resilience and disaster management. Additionally, the brief exploration of differences between VOAD/COAD members and non-members, on the one hand, shows that VOAD/COAD, as a network to connect government and disaster relief nonprofits, has played an important role in supporting individual organizations and facilitating communication, coordination, collaboration, and cooperation. On the other hand, the result indicates that encouraging the VOAD/COAD network to improve its inclusion for disaster relief nonprofit organizations, especially for those small, community-based organizations, would be beneficial.

This research also extends the discussion about dynamic capabilities by providing empirical evidence based on disaster relief nonprofit organizations and understanding the role of sub-capabilities, respectively. Previous literature examines the antecedents and outcomes of dynamic capabilities using cases from the for-profit sector, especially the influence of dynamic capabilities on organizational competitive advantage, product innovation, and long-term survival (Rindova & Kotha, 2001; Helfat & Peteraf, 2015; Winter, 2003; Salvato & Rerup, 2011). There is limited discussion about the dynamic capabilities in the field of the non-profit sector (i.e., Costa et al., 2020; Kaltenbrunner & Reichel, 2018), not even mentioning disaster relief nonprofit organizations. This research contributes to the theory of dynamic capabilities through demonstrating that instead of following the implied linear approach for adaptation, disaster relief nonprofit organizations take a rhizomic approach to conduct adaptation, and different types of dynamic capabilities diversely shape the performance of disaster relief nonprofit organizations in service provision, public policy engagement, and social capital

cultivation. The critical role of learning capabilities in influencing the acquired benefits from the VOAD/COAD network also provides additional perspectives to understand the influence of dynamic capabilities since only limited research has examined the impact of dynamic capabilities on network level performance (Kong & Farrell, 2010; Carley & Harrald, 1997). Additionally, instead of only regarding dynamic capabilities as a variable that is measured by latent variables, such as sensing, learning, integrating, and coordinating, this research observes the sub-capabilities separately. The result also suggests that in the nonprofit sector, these four capabilities lead to different outcomes.

Implications for Practice and Policy

Targeting the behavior of disaster relief nonprofit organizations in adjusting to the environment and exploring the relationship between dynamic capabilities and organizational performance, this research not only adds current discussion in both the field of nonprofit management and emergency management but also provides implications to the managers of disaster relief nonprofit organizations.

First, the research provides evidence-based suggestions for the manager of disaster relief nonprofit organizations about developing and maintaining dynamic capabilities. Sensing, learning, integrating, and coordinating capabilities matter for disaster relief nonprofit organizations. Being capable of adjusting to the environment enables disaster relief nonprofits to improve community resilience through meeting diverse community needs, promoting public policy engagement, and cumulating social capital. Learning capabilities can also improve organizational engagement in the VOAD/COAD network and collect more valuable information through the network. Thus, building these capabilities, especially learning capabilities through conducting

ground learning, peer learning, and attending trainings and workshops, can help disaster relief nonprofit organizations perform better. Also, the managers of disaster relief nonprofits need to enhance their engagement in the VOAD/COAD network. Those organizations that are actively engaged in the network can get volunteer support, financial opportunities, and reputation improvements. The engagement is extremely important for the younger organizations or organizations that have recently entered the field of disaster relief. The interaction based on the network will help them to extend their reputation and bring them new service requests and partners.

Furthermore, for emergency managers in local government and the board members of the VOAD/COAD network, this research also provides insights into their practice. VOAD/COAD sometimes plays as a single knot to connect disaster relief nonprofit organizations and government agencies (The Center for Disaster Philanthropy, 2022). The research indicates that the VOAD/COAD network does provide benefits to its member organizations to facilitate their service provision and efforts in boosting community resilience. Thus, as coordinators in emergency management, government officials can take advantage of the VOAD/COAD network for information sharing and supporting the development of the network, such as providing them financial support or having volunteer organizational liaisons to make sure that these valuable networks can operate well and share rich information to facilitate disaster management. Moreover, the variations between VOAD/COAD members and non-members in organizational size and type provide implications to the board members of the VOAD/COAD organization. Motivating small-size, community-based organizations, and organizations with broader missions to engage in the network would be helpful to reduce the biased views and

elevate the effectiveness of the network. Also, it is important for VOAD/COAD board members to keep this network active and maintain the relationship to enhance network capability. The potential approaches are through organizing workshops, drills, and events, as well as meeting periodically to share resources. Additionally, interactions and communication among different state VOADs to learn from each other may also be helpful for the operation of the network.

Limitations of the Research

Although this research displays its value through both adding discussion to current literature and providing implications to practitioners, there are still multiple limitations inherited in data availability and quality. First, the selection of interviewees is based on convenient samples, which may cause potential bias. For instance, all the interviewees are VOAD/COAD members, some of whom are board members or take responsibility for managing the network. However, lots of disaster relief nonprofits that contribute to disaster management are not VOAD/COAD members. This research may not provide enough insights about the non-VOAD members. To partly improve the representativeness of the research, random sampling is used for the survey, and both the VOAD/COAD members and non-members are included. Unfortunately, it is still relatively hard to target disaster relief nonprofit organizations because many of them provide not only disaster relief services but also other general human services. These organizations may not recognize themselves as disaster relief nonprofits, which makes it challenging to get access to them even randomly selecting the sample based on the NTEE code. For example, food service is needed in disaster settings, so organizations that recognize themselves as food banks & pantries (K31) are selected. However, they do not

all provide services in the aftermath of a disaster, which causes a relative response rate of 5.43%. However, using random sampling still helps to improve the representation of this research and the inclusion of non-VOAD members. About one-third of the respondents are non-VOAD members.

Additionally, the relatively small sample size limits the exploration this research can make. For example, although the data collection is based on three states, Arizona, Florida, and New Jersey, the variations of disaster relief nonprofit organizations and the VOAD/COAD network among these three states are not well-explored in this research. At the organizational level, this research uses the perceived uncertainty by organizational managers as a proxy of state-level differences because the influence of government, state policy, or state disaster status can finally reflect on the perceived environmental uncertainty. At the network level, VOAD/COAD at different states, even different counties, shows some variations. These variations, such as government support, network structure, and funding status, can impact the perceived benefits of disaster relief nonprofits from the network. Because of data limitations, these differences are measured only by one variable—network capability, specifically the perceived active level of the network members. Additionally, although the analytical result shows that attending VOAD/COAD does not significantly influence the benefits, which partly supports the idea that regarding VOAD/COAD as one network instead of separating them, a more comprehensive and systemic measurement of network differences among states and between state and local levels would be beneficial for both literature and practice.

The sample size also influences analytical methods. With a limited sample size, this research cannot examine the measurements of dynamic capabilities by conducting

the confirmatory factor analysis and applying structural equation modeling. Instead, the influence of sensing, learning, integrating, and coordinating are examined respectively. To improve the reliability and validity, this research measures the variables established in previous literature and did a peer review, followed by a pilot study, before the survey is formally available to the respondents. Examining the influence of each sub-capability also contributes to the discussion about dynamic capabilities and implies the necessity of investigating the relationship among various types of dynamic capabilities.

There are also limitations in variable measurements. This research uses the self-reported survey to evaluate the performance of disaster relief nonprofit organizations, which could cause certain biases associated with the characteristics of the respondents. Some respondents may hold a more positive attitude toward the organization, which may lead to a relatively higher score for their performance. Some respondents may have a high standard for organizational behavior, so their evaluation of organizational performance would be relatively lower. Including objective factors, such as the frequency of responding to disasters or the number of served clients, would be helpful.

Opportunities for Future Research

The results and limitations of this research imply multiple future topics regarding dynamic capabilities in the nonprofit sector, the performance of the VOAD/COAD network, and the state-level comparison of disaster relief nonprofit organizations.

The antecedents and outcomes of dynamic capabilities in the nonprofit sector are still under-explored. This research provides empirical evidence to demonstrate the importance of dynamic capabilities in the nonprofit sector by using an example of disaster relief nonprofit organizations. Considering the environmental uniqueness of

disaster settings and the features of disaster relief nonprofit organizations, it is necessary to provide more evidence from other types of nonprofit organizations, such as art and museums, nonprofit hospitals, and even foundations. Additionally, although revenue and financial performance are not the ultimate concerns of disaster relief nonprofit organizations, they play an important role in organizational survival and development. It would be interesting to test the influence of dynamic capabilities on the financial performance of disaster relief nonprofit organizations.

Understanding the process for disaster relief nonprofit organizations to provide service in a disaster setting and exploring how they keep a balance between general operation and disaster demands, especially for those organizations that have broader programs, are invaluable topics. This research endeavors to investigate how dynamic capabilities influence service provision, public policy engagement, and social capital cultivation. It pays attention to the adaptation and the underlying capabilities, but with limited discovery about the process for organizations to provide disaster relief service and the approaches for them to do public policy engagement. Thus, using in-depth interviews and observation data to uncover the black box of disaster relief services would be another vital topic.

This research also implies the necessity of comparative research about the VOAD/COAD network nationwide. The result of this study shows the variations of the VOAD/COAD network. Although there are similarities, the relatively wide range of the perceived active level of the VOAD/COAD network indicates that different state VOADs and local COADs may show significant differences in network capability, structure, and performance. The interview data from the VOAD chairs in three states also suggests that

VOADs get different levels of support from the state government. Some of them are with full-time employees, while others run as a volunteer-based network. Additionally, their role in each state varies. One state VOAD chair mentioned that their role in connecting disaster relief nonprofits and the government is gradually being replaced by another network. Further discussion about how to build a more effective VOAD/COAD network would be invaluable.

Additionally, it is not uncommon for disaster relief nonprofit organizations to engage in multiple networks and build collaboration with different types of organizations. The discussion about networks in this research focuses on the VOAD/COAD network, while there are other networks that disaster relief nonprofit organizations are actively engaged in. Thus, exploring reasons and motivations regarding why organizations engage in a specific network instead of others would be interesting. The relationship between different networks is also imperative. Whether different networks will promote each other and ultimately improve the effectiveness of disaster management or they will compete with each other for limited resources, such as members and funding, would be meaningful questions to explore. Moreover, this research focuses on the state-level VOAD and county-level COAD. It is interesting to examine the performance of VOAD/COAD networks hierarchically to compare the operation and responsibility of national VOAD, state VOADs, and local COADs.

Finally, at the organizational level, factors that can influence the decision to engage in the VOAD/COAD network are not fully explored. In the practice of disaster response in many states, VOAD/COAD is the single connection for emergency managers to make full use of resources from the nonprofit sector. Thus, it would be beneficial for

disaster relief nonprofit organizations to participate in the VOAD/COAD network since they can get access to valuable information and interact with local government. The results of this research also support the idea. However, about one-third of survey respondents are not VOAD/COAD network members. It is better to understand why they are not interested in formally joining the VOAD/COAD network.

Conclusion

This research aims to answer the question of how disaster relief nonprofit organizations adjust to the changing environment and continuously engage in emergency management. Starting with exploring the identified role of disaster relief nonprofits based on the formal government documents and policy, this research collects interview and survey data from Arizona, Florida, and New Jersey to better understand the adaptations of disaster relief nonprofit organizations, the procedures for these organizations to make adaptation, the supportive capabilities for adaptations, and the impact of these capabilities on nonprofit performance at both organizational and network levels. This research contributes to the discussion about disaster relief nonprofit organizations and the whole-community approach by exploring the behavior of nonprofit organizations and their efforts in promoting performance in disaster settings. At the same time, introducing the theory of dynamic capabilities in the nonprofit sector and providing empirical evidence about the relationship between dynamic capabilities and nonprofit performance expands the application of the theory from the private sector to the nonprofit sector. The findings of this research shed light on the managerial practice of disaster relief nonprofits. Targeting different dimensions of organizational performance, it is necessary for disaster relief nonprofit managers to pay attention to specific capabilities. Not all set of dynamic

capabilities shows the same influence on organizational performance. At the same time, engaging in the VOAD/COAD network actively provides organizations with more resources.

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APPENDIX A
INTERVIEW PROTOCOL (CHAPTER 3)

For the Basic information:

1. Could you please give me some basic information about your position in the Florida PDA Network, and your experience related to disaster relief services?
2. What kinds of services our Salvation Army provides and what are the procedures for service provision?

For the practice of innovation and adjustment:

3. Could you please share several examples about the innovation, adjustment or improvement in the Salvation Army within the past years?

Reasons for adjustments and innovation:

4. Why do you think the organization adapted to the changes? What factors motivated the adjustments?
5. Could you please share the general procedures/ steps for taking the innovation/ adjustments, and make the change successfully? (This question could base on the examples provided for Q3)

Results of the adjustments and innovation:

6. Have you experienced any challenges in conducting organizational innovation and adjustments? How were these challenges addressed?
7. What do you think are the benefits, both at the organizational level and the community level, of these innovations and adjustments?
8. Is there anything that you think is very important, but I never mentioned?

APPENDIX B

LIST OF THE SELECTED NTEE CODE (CHAPTER 3)

NTEE	Description	Definition	AZ Num. (Select)	FL Num. (Select)	NJ Num. (Select)
C60	Environmental Education	Organizations such as nature centers that provide informal classes which acquaint participants with particular aspects of their environment and increase their understanding of and appreciation for ecological balance.	41 (8)	110 (22)	42 (8)
D20	Animal Protection & Welfare	Organizations such as animal shelters that provide for the humane care, protection and control of animals and which investigate instances of cruelty to animals.	602 (120)	1556 (311)	539 (108)
D30	Wildlife Preservation & Protection	Organizations that are responsible for the conservation, protection, care and management of fish and wildlife resources and their habitats. Use this code for organizations that provide wildlife preservation services not specified below or which deal with multiple populations of wildlife.	30 (6)	111 (22)	13 (3)
E62	Emergency Medical Services & Transport	Organizations that provide pre-hospital emergency medical care and rapid transportation to health care facilities.	15 (3)	28 (6)	209 (42)
F30	Mental Health Treatment	Organizations that provide preventive, diagnostic and treatment services in a variety of community and hospital-based settings to help people to achieve and maintain a state of emotional well-being, personal empowerment and the skills to cope with everyday demands without excessive stress. Use this code for types of mental health organizations not specified below or for organizations that combine multiple types of care within the same facility.	32 (6)	117 (23)	51 (10)
F40	Hot Lines & Crisis Intervention	Organizations that provide in-person or telephone assistance for people who are in acute emotional distress; who are a danger to themselves or to others; who are having suicidal feelings; or who are hysterical, frightened or otherwise unable to cope with a problem that requires immediate action. Use this code for	4 (1)	25 (5)	9 (2)

NTEE	Description	Definition	AZ Num. (Select)	FL Num. (Select)	NJ Num. (Select)
		crisis intervention services or hotlines not specified below or for organizations that offer multiple types of crisis intervention, hotline services.			
K31	Food Banks & Pantries	Organizations that gather, store and distribute food to indigents at no charge or at low cost.	65 (13)	152 (30)	72 (14)
K34	Congregate Meals	Organizations (also known as nutrition sites or senior nutrition programs) that provide hot meals on a regular basis, usually for elderly individuals but also for disabled adults or other target populations.	3 (1)	24 (5)	9 (2)
K35	Soup Kitchens	Organizations that provide meals in a central location for indigent people.	1 (0)	13 (3)	8 (2)
K36	Meals on Wheels	Organizations that prepare and deliver regular hot meals to elderly individuals, people with disabilities or people with AIDS or other targeted conditions who are unable to shop and/or prepare food for themselves or to travel to a site where a meal is being served. Also known as home delivered meals.	11 (2)	30 (6)	16 (3)
L40	Temporary Housing	Organizations that provide a temporary place to stay for newcomers, travelers, people who are in crisis, or homeless individuals in the community.	30 (6)	100 (20)	17 (3)
L41	Homeless Shelters	Organizations that provide a temporary place to stay for people who have no permanent housing.	47 (9)	194 (39)	74 (15)
M20	Disaster Preparedness & Relief Services	Organizations that work to prevent, predict or control the effects of disasters (e.g. floods, earthquakes, fires, tornadoes), to educate or otherwise prepare individuals to cope with the effects of such disasters or to provide broad-based relief services to victims of such disasters. Use this code for organizations that provide a wide range of disaster services or for those that offer disaster services not specified below.	24 (24)	168 (168)	48 (48)

NTEE	Description	Definition	AZ Num. (Select)	FL Num. (Select)	NJ Num. (Select)
M23	Search & Rescue Squads	Volunteer and other organizations that provide emergency rescue operations and/or lifesaving activities for people who are stranded, lost, accident victims, or exposed to other life-threatening dangers. Included may be organizations that participate in air rescue, mountain rescue, sea rescue, ski rescue, traffic accident rescue and urban search and rescue operations.	23 (5)	46 (9)	34 (7)
M24	Fire Prevention	Organizations that are responsible for the control and extinction of fires; and the inspection of buildings, hillside property and industrial plants to ensure compliance with fire codes.	66 (13)	151 (30)	424 (85)
M40	Safety Education	Organizations that make the public aware of the measures that people can take to reduce the risk of accidents. Use this code for general safety programs or those that deal with a specific safety education issue not specified below.	26 (5)	76 (15)	16 (3)
M41	First Aid	Organizations that provide instruction in the basic lifesaving techniques that are used in the administration of emergency assistance to individuals who have been injured prior to the arrival of trained medical personnel. Includes CPR instruction and instruction in techniques for relieving an individual who is choking.	3 (1)	14 (3)	75 (15)
P20	Human Service Organizations	Organizations that provide a broad range of social services for individuals or families. Use this code for multiservice organizations such as Lutheran Social Services, Catholic Social Services and other community service organizations not specified below that provide a variety of services from throughout the P section or services from the P section in combination with services described in other sections (e.g., an organization that provides family	571 (114)	2884 (577)	829 (166)

NTEE	Description	Definition	AZ Num. (Select)	FL Num. (Select)	NJ Num. (Select)
		counseling, substance abuse services, employment assistance and services for at-risk youth).			
P21	American Red Cross	Separately incorporated, local chapters of the American Red Cross.	1 (0)	3 (1)	0 (0)
P24	Salvation Army	Separately incorporated, local Salvation Army sites.	0 (0)	4 (1)	3 (1)
P26	Volunteers of America	Separately incorporated, local Volunteers of America sites.	0 (0)	12 (2)	1 (0)
P60	Emergency Assistance	Organizations that provide food, clothing, household goods, cash and other forms of short-term emergency assistance for indigent individuals and families who have insufficient resources to meet their basic needs.	79 (16)	307 (61)	111 (22)
P85	Homeless Centers	Organizations that provide supportive services for individuals and families who are homeless or which work with people who are at risk for homelessness in an effort to prevent them from losing their permanent residence.	28 (6)	115 (23)	27 (5)
T40	Voluntarism Promotion	Organizations that encourage people to volunteer. (rev. 1/05)	10 (2)	45 (9)	23 (5)
Total			1712 (361)	6285 (1391)	2650 (569)

APPENDIX C

SURVEY INVITATIONS EMAIL (CHAPTER 3)

Dear (name):

A research team of Arizona State University are currently conducting a study and would like to invite you to participate.

The study tries to understand nonprofits' involvement in disaster relief work (including preparedness, prevention, response and recovery), the innovation and adaptation related to disaster service, as well as organizational capacities in supporting community resilience.

This (Attached the link in the future) is a short survey asking questions that help us to understand the issue. Please have the executive director or person who is most knowledge of your organization's disaster relief service to complete this questionnaire.

Your responses will be confidential. The personal recognized information will be replaced with research identification codes. The results of this study may be used in dissertation, reports, presentations, or publications in which your name will not be used. By filling out and returning the survey, you can provide valuable information for better understanding on how nonprofit organizations improve the capabilities and adjust to the environment for disaster services.

Your participation in this study is voluntary. To thank you for your time and support, you will have an option to enter into the gift card drawing to win a \$20 (30 in total) VISA gift card after successfully complete the survey when you successfully finish the survey. All who participate in this study will be eligible to receive a report with results and action items that you can implement to improve your organizational disaster relief work.

We hope that you can help us understand the importance of nonprofits in disaster settings, and your efforts in conducting organizational adjustments and innovation. We look forward to working with you.

Sincerely,

Lili Wang

Peiyao Li

APPENDIX D
QUESTIONNAIRE

Adaptation and Innovation of Disaster Relief Nonprofits

Consent Statement

Dear Sir/Madam,

I am Peiyao Li, a doctoral candidate under the direction of Dr. Lili Wang, Dr. Brian Gerber, and Dr. Melanie Gall, from Arizona State University. I am conducting a study to understand nonprofits' involvement in disaster relief (including preparedness, mitigation/prevention, response and recovery), which is expected to get responses from 350-400 nonprofit managers, staff, and volunteers. To fully understand the adaptations and strategic changes disaster relief nonprofits have made to adjust to their environments, it is vital that we can hear from nonprofit leaders like you.

Therefore, I would like to invite you to complete this **brief 15-minute** online survey through Qualtrics. **The survey includes questions about how your organization adapts to dynamic environment, and the organizational participation in state Voluntary Organizations Active in Disaster (VOADs) and/or Community Organizations Active in Disaster (COADs) if applicable.** You have the right not to answer questions and to stop participating at any time.

Your participation in this study is voluntary. **After successful completion of the survey, participants will be entered into a gift card drawing to potentially win a \$20 VISA gift card (30 in total available). You need to be older than 18 years of age and work in a nonprofit organization that engage in disaster relief (including preparedness, prevention, response and recovery) to participate in the study.** If you choose not to participate or to withdraw from the study at any time, there will be no penalty.

Your response to the survey will help to better explore the innovations and adaptations of disaster-related nonprofit organizations. This study may provide evidence-based solutions for other nonprofits on how to improve organizational performance under environmental uncertainty. There are no foreseeable risks to your participation. **All who participate in this study will be eligible to receive a report with results and action items that you can implement to improve your organizational disaster relief work.**

Your responses will be confidential. The personal recognized information will be replaced by research identification codes. The results of this study may be used in my dissertation, reports, presentations, or publications in which your name will not be used. The de-identified data collected as a part of the current study will potentially be shared with other investigators for future research purposes.

Thank you for your input. If you have any questions concerning the research, please email the research team Dr. Lili Wang (Lili.Wang@asu.edu) or Ms. Peiyao Li (peiyao.li@asu.edu) or call/text (602) 668-8468. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance,

at (480) 965-6788. Please let me know if you wish to be part of the study. By signing below, you are agreeing to be part of the study.

- I consent, begin the survey. (1)

Q1 What are your organization's name and zip code?

- Organization (1) _____
- Zip code (2) _____

Q2 Does your organization provide or support service(s) for disaster preparedness, mitigation, response, or recovery?

Note: If you are working/volunteering in a national organization, please answer all the following questions based on the **division/local chapter** you work in.

- Yes (1)
- No (2)

Skip To: End of Survey If Does your organization provide or support service(s) for disaster preparedness, mitigation, respo... = No

Q3 How do you categorize your organization?

Note: "gray sky" organizations only provide disaster relief services (preparedness, mitigation, response, and recovery). "Blue sky" organizations provide multiple services, disaster relief is included.

- Full "gray sky" organization (1)
- "Blue sky" organization, with a relatively LARGE disaster unit (4)
- "Blue sky" organization, with a relatively SMALL disaster unit (3)
- Other (5) _____

Q4 How long has your organization been involved in the disaster relief field?

- less than 1 year (1)
- 1-3 years (2)
- 4-6 years (3)
- 7-10 years (4)
- more than 10 years (5)



Q5 Which disaster phase does your organization participate in? (Please check all that apply)

- Disaster preparedness (1)
- Disaster mitigation/prevention (2)
- Disaster response (3)
- Disaster recovery (4)

Q6 What are the disaster relief services your organization typically provides? (Please check all that apply)

- Distribution of essential resources (packed food, water, clothing, etc.) (1)
 - Mass feeding services (meal preparedness, food delivery, etc.) (2)
 - Emergency sheltering (3)
 - Donation management & distribution (4)
 - Financial assistance (cash assistance, financial counseling, etc.) (5)
 - Debris removal and housing clean-up (or providing supplies for clean-up) (6)
 - Housing repair, rebuilding, and retrofitting (7)
 - Information and referral services (hotline, communication, technical support, etc.) (8)
 - First aid or emergency medical/ lifesaving assistance services (9)
 - Family reunion and other survivor services (10)
 - Emotional and spiritual care (11)
 - Mental health services (12)
 - Volunteer management and support services (13)
 - Disability assistance services (14)
 - Animal care and support services (15)
 - Environmental education (16)
 - Transportation support (17)
 - Others (please specify) (18)
-








Q7 How much do you agree with the following statements about your organization’s disaster relief performance in general?

	Strongly disagree	Strongly agree
	0 1 2 3 4 5	6 7 8 9 10
My organization meets communities’ unmet disaster relief needs. (1)		
My organization pays attention to the underrepresented groups who could be or were affected by disasters. (2)		
My organization provides prompt, accessible, and courteous services either before, during, or after disasters. (3)		
My organization provides cost-efficient disaster relief services. (4)		
My organization participates in state/local government committees/commissions. (5)		
My organization meets with state/local public officials and staff (e.g. emergency management director and staff, elected officials, etc.). (6)		
My organization influences state/ local disaster-related policy making. (7)		
My organization educates local community members to help neighbors during disasters. (8)		
My organization strengthens local community collaboration for disasters. (9)		
My organization improves the engagement of community members (e.g., volunteering, donating) for disaster relief. (10)		

Q8 Thinking about the situation over the past 5 years, how much do you agree with the following statements about your organization's disaster relief practice/program/ministry?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
Supporting/providing disaster relief service(s) has been critical in my organization. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The disaster relief program in my organization has mainly relied on volunteer support . (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The disaster relief program in my organization has mainly provided services for our local county . (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization has been very active in engaging in disaster relief work . (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q1 How much do you agree with the following statements about your organization's environment over the past 5 years?

	Strongly disagree	Strongly agree
	0 1 2 3 4 5	6 7 8 9 10
My organization has faced financial pressure in providing disaster relief services. (1)		
My organization has experienced a major leadership transition . (2)		
My organization has competed for resources (e.g., volunteers, donations) with other disaster relief organizations. (4)		
My organization has experienced a stable political and/or legal environment . (5)		
My organization has made significant changes because of COVID-19 . (6)		
My organization has made adaptations because of climate change . (7)		
My organization has faced a high level of uncertainty . (8)		









Q2 To the best of your knowledge, what adaptation(s) has your organization made over the past 5 years? (Please check all that apply)

- Renamed/rebranded the organization (1)
- Started/expanded disaster relief program (2)
- Downsized disaster relief program (3)
- Temporally suspended disaster relief services (4)
- Modified volunteer or staff management (e.g., online training) (5)
- Applied new models for providing disaster relief services (e.g., one-stop-shop) (6)
- Applied new technologies in service provision (e.g., GIS, dashboard) (7)
- Started to provide NON-DISASTER relief services (8)
- Switched from short-term response to long-term recovery (9)
- Extended service from natural disasters to man-made disasters (10)
- Modified logistics (e.g., new warehouse, new supply chain) (11)
- Built new collaborative agreements with other agencies or organizations (12)
- Engaged in or started a new collaborative network (e.g., coalition) (13)
- Reduced efforts in collaborations or partnerships (14)
- Others (please specify) (15) _____
- Digitalized service provision (16)
- Not applicable (17)

Q3 Thinking about the practice and adaptation(s) your organization has made over the past 5 years, how much do you agree with the following statements about your organization's sensing and learning capabilities?

	Strongly disagree	Strongly agree	Not Applicable
	0 1 2	3 4 5 6 7	8 9 10
My organization has known how to access new information (e.g., knowing popular-used website, workshop/conference in disaster relief field). (1)			
My organization has frequently scanned the environment (e.g., government policies, opening funding opportunities, local needs) to improve disaster relief services . (2)			
My organization has periodically discussed and evaluated the likely effect of changes in the field (e.g., legal changes, COVID-19 infection rates, local leadership of emergency management department). (3)			
My organization has noticed the best practices (e.g., good strategies and models) in the disaster relief field. (4)			
My organization has devoted enough time to gaining new disaster relief knowledge (e.g., through ground learning, workshops, training, and feedbacks). (5)			
My organization frequently has had group discussions/meetings to assimilate lessons learned on the ground, in workshop and from feedback. (6)			
My organization has utilized new knowledge to develop new practices (e.g., using knowledge to address different types of disasters or providing services in different regions). (7)			

Q4 Thinking about the practice and adaptation(s) your organization has made over the past 5 years, how much do you agree with the following statements about your organization's capabilities to adapt to the environment?

	Strongly disagree	Strong agree	Not Applicable
	0 1 2 3	4 5 6 7	8 9 10
My organization has involved staff/volunteers when making decisions about changes. (1)			
My organizational staff/volunteers has recognized each other's responsibility for implementing the adaptation. (2)			
My organization has communicated well, and all staff and/or volunteers have been on the same page about the organizational change. (3)			
My organization has effectively integrated efforts from each staff member/volunteer to make the change successful. (4)			
My organization has appropriately allocated resources for adjusting to the environment. (5)			
My organization has properly assigned tasks to the right personnel(s) with adequate knowledge for implementing the adaptation/change. (6)			
My organization has been well coordinated to adapt to the environments. (7)			
My organization has demonstrated strengths in adapting to the environments. (8)			

Q1 To the best of your knowledge, how many years has it been since your organization was founded?

- Less than 1 year (1)
- 1-3 years (2)
- 4-6 years (3)
- 7-9 years (4)
- More than 9 years (5)

Q2 Which of the categories below most closely aligns with your role in the organization?
(Please check all that apply)

- Leadership (1)
- Project manager (2)
- Other paid staff (3)
- Volunteer (4)
- Others (please specify) (5) _____

Q3 How long have you been working in the organization?

- Less than 1 year (1)
- 1-3 years (2)
- 4-6 years (3)
- 7-9 years (4)
- More than 9 years (5)

Q5 Based on your best guess, what was total annual operating budget of your organization in FY2021?

Note: just your chapter/division if the organization is a national one

Q4 Could you please indicate the contribution percentage of each different source to your organization's finances?

- Government grants (1) _____
- Foundation grants (2) _____
- Charitable giving (3) _____
- Membership fees (4) _____
- Service charges (5) _____
- Other (please specify) (6) _____

Q5 How much do you agree with the following statements about your organization's leadership over the past 5 years?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither disagree nor agree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
My organization's leadership has acted in a way that earns my respect. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization's leadership has articulated a compelling vision of the future. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization's leadership has sought different perspectives when solving problems. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My organization's leadership has cared about my needs, abilities, and aspirations. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q1 What option best describes your organization?

Note: VOAD refers to Voluntary Organizations Active in Disaster
 COAD refers to Community Organizations Active in Disaster
 VOAD or VOAD member (1)

COAD or COAD member (2)

Both VOAD members (including COAD and other members) and COAD members (3)

Neither VOAD nor COAD member (4)

Skip To: Q1 If What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = COAD or COAD member
 Skip To: End of Block If What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = Neither VOAD nor COAD member

Q2 How long has your organization been a member of the VOAD?

Less than 1 year (1)

1-3 years (2)

4-6 years (3)

7-9 years (4)

More than 10 years (5)

Q3 How much do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
My organization is an active participant in the state VOAD. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The State VOAD is active. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4 Does your organization get the following benefits by participating in the VOAD?

	Definitely no					Definitely yes					
	0	1	2	3	4	5	6	7	8	9	10
Getting information about potential funding or starting a joint grant application (1)											
Getting financial support (2)											
Keeping volunteers engaged and active in non-disaster settings (3)											
Getting volunteer support from other member organizations (4)											
Getting goods & supplies (e.g., PPE, trucks) from other member organizations (5)											
Starting joint programs with other organizations (6)											
Getting helpful guidelines (7)											
Acquiring a good reputation and legitimacy (8)											
Other (9)											

Q5 How much do you agree with the following statements about VOAD members?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
The VOAD members act honestly and honorably. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The VOAD members are capable and competent in their fields. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The VOAD members collaborate more than they compete with each other. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = Both VOAD member (including COAD and other members) and COAD member

Or What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = COAD or COAD member

Q1 How long has your organization been a member of the COAD?

- less than 1 year (1)
- 1-3 years (2)
- 4-6 years (3)
- 7-9 years (4)
- more than 10 years (5)

Display This Question:

If What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = Both VOAD member (including COAD and other members) and COAD member

Or What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = COAD or COAD member

Q2 How much do you agree with the following statements?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
My organization is an active participant in the COAD (s). (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The COAD (s) we engaged is active. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Display This Question:

If What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = COAD or COAD member

Or What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = Both VOAD member (including COAD and other members) and COAD member

Q3 Does your organization get the following benefits through participating in the COAD?

	0	1	2	3	4	5	6	7	8	9	10
Getting information about potential funding or starting a joint grant application (1)											
Getting financial support (2)											
Keeping volunteers engaged and active in non-disaster settings (3)											
Getting volunteer support from other member organizations (4)											
Getting goods & supplies (e.g., PPE, trucks) from other member organizations (5)											
Starting joint programs with other organizations (6)											

Getting helpful guidelines (7)	
Acquiring a good reputation and legitimacy (8)	
Other (9)	

Display This Question:

If What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = COAD or COAD member

Or What option best describes your organization? Note: VOAD refers to Voluntary Organizations Active... = Both VOAD member (including COAD and other members) and COAD member

Q4 How much do you agree with the following statements about COAD members?

	Strongly disagree (1)	Disagree (2)	Somewhat disagree (3)	Neither agree nor disagree (4)	Somewhat agree (5)	Agree (6)	Strongly agree (7)
The COAD members act honestly and honorably. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The COAD members are capable and competent in their fields. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The COAD members collaborate more than they compete with each other. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q1 If there is anything that you think is very important but we never mentioned in the survey, please list them below:

Q2 Would you like to enter a drawing for a \$20 VISA gift card (with 30 gift cards available in total)? Your response will still remain anonymous.

Yes (1)

No (2)

APPENDIX E

MEASUREMENTS FOR CONTROL VARIABLES (CHAPTER 4-Q2)

Variables	Measurement	Survey Questions
Disaster relief focus	Value of the survey item measured on a seven-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Somewhat disagree"; 4 = "Neither disagree nor agree"; 5 = "Somewhat agree"; 6 = "Agree"; 7 = "Strongly agree")	Thinking about the situation over the past 5 years, how much do you agree with the following statements about your organization's disaster relief practice/program/ministry? <ul style="list-style-type: none"> Supporting/providing disaster relief service(s) has been critical in my organization.
Leadership	Mean of the four survey items measured on a seven-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Somewhat disagree"; 4 = "Neither disagree nor agree"; 5 = "Somewhat agree"; 6 = "Agree"; 7 = "Strongly agree")	How much do you agree with the following statements about your organization's leadership over the past 5 years? <ul style="list-style-type: none"> My organization's leadership has acted in a way that earns my respect. My organization's leadership has articulated a compelling vision of the future. My organization's leadership has sought different perspectives when solving problems. My organization's leadership has cared about my needs, abilities, and aspirations.
Organizational size (log)	Value of the survey item measured in 1k dollar amount in log form	Based on your best guess, what was the total annual operating budget of your organization in FY2021?
Organizational age	0- Less than 9 years 1- More than 9 years	To the best of your knowledge, how many years has it been since your organization was founded?
Uncertainty level	0- Limited Uncertainty (from 0-5 from the original data) 1- Strong Uncertainty (from 6-10 from the original data)	How much do you agree with the following statements about your organization's environment over the past 5 years? <ul style="list-style-type: none"> My organization has faced a high level of uncertainty.
VOAD/COAD engagement	0- Non-VOAD/COAD member 1- VOAD/COAD member	What option best describes your organization? <ul style="list-style-type: none"> VOAD or VOAD member COAD or COAD member Both VOAD member and COAD member Neither VOAD nor COAD member

APPENDIX F

MEASUREMENTS FOR CONTROL VARIABLES (CHAPTER 4-Q3)

Variables	Measurement	Survey Questions
Network Capacity	Value of the survey item measured on a seven-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Somewhat disagree"; 4 = "Neither disagree nor agree"; 5 = "Somewhat agree"; 6 = "Agree"; 7 = "Strongly agree")	<p>How much do you agree with the following statements?</p> <ul style="list-style-type: none"> • The State VOAD is active. (if they are VOAD members) • The COAD(s) we engaged are active. (if they are COAD members)
VOAD Member	<p>Recoding the value of the survey item:</p> <p>0- COAD member 1- VOAD member</p>	<p>What option best describes your organization?</p> <ul style="list-style-type: none"> • VOAD or VOAD member • COAD or COAD member • Both VOAD member and COAD member • Neither VOAD nor COAD member
Organizational Embeddedness	Value of the survey item measured on a seven-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Somewhat disagree"; 4 = "Neither disagree nor agree"; 5 = "Somewhat agree"; 6 = "Agree"; 7 = "Strongly agree")	<p>How much do you agree with the following statements?</p> <ul style="list-style-type: none"> • My organization is an active participant in the state VOAD.
Organizational Size (log)	Value of the survey item measured in 1k dollar amount in log form	Based on your best guess, what was total annual operating budget of your organization in FY2021?
Organizational Age	<p>0- Less than 9 years 1- More than 9 years</p>	To the best of your knowledge, how many years has it been since your organization was founded?

APPENDIX G

ADDITIONAL VARIABLES FOR THE MANN-WHITNEY U TEST (CHAPTER 4)

Variables	Measurement	Survey Questions
Organizational Features	Value of the survey item measured on a seven-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Somewhat disagree"; 4 = "Neither disagree nor agree"; 5 = "Somewhat agree"; 6 = "Agree"; 7 = "Strongly agree")	Thinking about the situation over the past 5 years, how much do you agree with the following statements about your organization's disaster relief practice/program/ministry? <ul style="list-style-type: none"> • The disaster relief program in my organization has mainly relied on volunteer support. • The disaster relief program in my organization has mainly provided services for our local county.
External Environment	Value of the survey item measured on a seven-point Likert scale (1 = "Strongly disagree"; 2 = "Disagree"; 3 = "Somewhat disagree"; 4 = "Neither disagree nor agree"; 5 = "Somewhat agree"; 6 = "Agree"; 7 = "Strongly agree")	Thinking about the situation over the past 5 years, how much do you agree with the following statements about your organization's disaster relief practice/program/ministry? <ul style="list-style-type: none"> • The disaster relief program in my organization has mainly provided services for our local county. • My organization has faced financial pressure in providing disaster relief services. • My organization has experienced a major leadership transition. • My organization has competed for resources (e.g., volunteers, donations) with other disaster relief organizations. • My organization has experienced a stable political and/or legal environment. • My organization has made significant changes because of COVID-19. • My organization has made adaptations because of climate change.

APPENDIX H
IRB APPROVAL LETTER

EXEMPTION GRANTED

[Lili Wang](#)

[WATTS: Community Resources and Development, School of](#)

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Lili.Wang@asu.edu

Dear [Lili Wang](#):

On 5/11/2022 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Dynamic Capabilities and Network Benefits: How the Performance of Disaster Relief Nonprofits is Shaped under Uncertainty
Investigator:	Lili Wang
IRB ID:	STUDY00015879
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Consent form for Interview, Category: Consent Form; • Consent form for Survey, Category: Consent Form; • IRB FORM-LW PL, Category: IRB Protocol; • Recruitment email-interview-05.04.2022, Category: Recruitment Materials; • Recruitment email-survey-05.04.2022, Category: Recruitment Materials; • Supporting documents-Interview- 05.04.2022, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Supporting documents-questionnaire-05.07.2022, Category: Measures (Survey questions/Interview

	<p>questions /interview guides/focus group questions);</p> <ul style="list-style-type: none">• Supporting documents-timeline-05.04.2022, <p>Category: Technical materials/diagrams;</p>
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The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 5/9/2022.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

REMINDER - Effective January 12, 2022, in-person interactions with human subjects require adherence to all current policies for ASU faculty, staff, students and visitors. Up-to-date information regarding ASU's COVID-19 Management Strategy can be found here. IRB approval is related to the research activity involving human subjects, all other protocols related to COVID-19 management including face coverings, health checks, facility access, etc. are governed by current ASU policy.

Sincerely,

IRB Administrator

cc: Peiyao Li
Peiyao Li
Brian Gerber

EXEMPTION GRANTED

Lili Wang

WATTS: Community Resources and Development, School of

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Lili.Wang@asu.edu Dear

[Lili Wang](#):

On 8/18/2022 the ASU IRB reviewed the following protocol:

Type of Review:	Modification / Update
Title:	Dynamic Capabilities and Network Benefits: How the Performance of Disaster Relief Nonprofits is Shaped under Uncertainty
Investigator:	Lili Wang
IRB ID:	STUDY00015879
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Consent form for Survey-Clean Version, Category: Consent Form; • IRB FORM-Clean Version, Category: IRB Protocol; • Recruitment email-survey-Clean version, Category: Recruitment Materials; • Supporting documents-Survey-Clean Version, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 8/18/2022.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

REMINDER - - Effective January 12, 2022, in-person interactions with human subjects require adherence to all current policies for ASU faculty, staff, students and visitors. Up-to-date information regarding ASU's COVID-19 Management Strategy can be found [here](#). IRB approval is related to the research activity involving human subjects, all other protocols related to COVID-19 management including face coverings, health checks, facility access, etc. are governed by current ASU policy.

Sincerely,

IRB

Administrator

cc: Peiyao

Li

Brian Gerber