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How Childcare Type and Disaster Recovery Funding Type Impact Childcare Recovery

Heather L. Beal
Walden University

Walden University

College of Social and Behavioral Sciences

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Heather L. Beal

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Review Committee
Dr. David DiBari, Committee Chairperson,
Public Policy and Administration Faculty

Dr. Bruce Lindsay, Committee Member,
Public Policy and Administration Faculty

Dr. Benedict Tafoya, University Reviewer,
Public Policy and Administration Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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Heather L. Beal

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Childcare is critical community infrastructure, yet it is typically not eligible for recovery assistance postdisaster. The effect of disaster on children has been extensively studied and research indicates that the return to normalcy (e.g., through restoration of childcare programs) helps aid recovery. Despite this, little research has been conducted on how childcare programs recover. The purpose of this research was to investigate how the recovery times for childcare programs affected by Superstorm Sandy varied based on childcare typology and the recovery funding resources used. A quasi-experimental research design was selected and data from 76 surveys was evaluated using one-way and factorial analysis of variance. The research questions were designed to evaluate the impact of recovery funding types used, childcare type, number of recovery funding resources used, and the interaction of childcare type and recovery funding types used on recovery time. Resource dependence theory was chosen as the theoretical framework because of its precept that only effective organizations survive through application of behaviors such as diversification of resources. The results revealed that there was a statistically significant relationship between the number of recovery resources used and recovery time ($p = .04$). Social change starts with information. This study supported social change by providing a baseline for childcare recovery research and emphasizing the importance of childcare to both community recovery and the recovery of children in disaster recovery policy.

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Dedication

This study is dedicated to childcare providers. These unsung heroes hold children's lives in their hands more often than parents wish to think about. They are a key part of our everyday life, and without them, communities cannot recover from disaster.

This study is also dedicated to emergency managers and policy makers. I hope that the quantitative data collected and analyzed herein helps better inform public policy and disaster recovery planning efforts.

Acknowledgments

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Chapter 1: Introduction to the Study

Disaster impacts the entire community (Federal Emergency Management Agency, 2016b). While a hurricane may not damage all structures equally, its damage can be felt in many ways across the entire community. When Superstorm Sandy made landfall in October, 2012, it caused over $50 billion in damage and generated over 700,000 tons of debris in the New York City emergency management coverage area (Murrin, 2015; New York City, 2013; Phillips, 2016).

Community recovery means not just that individuals' lives and homes are returned to a state of normal, but also the infrastructure that supports them and their livelihood is also reestablished. The road to community recovery depends on the ability of affected businesses to return to operations. If parents cannot return to their jobs because they lack a safe place to leave their children, recovery will not happen (Murrin, 2015). Dependency on childcare for community economic and social wellbeing has been historically understated, and even today, little data exists on childcare preparedness or recovery postdisaster. This study helps highlight the importance of childcare recovery and the difficulties it faces by creating baseline data on childcare recovery that policymakers can use as an initial metric to improve postdisaster recovery funding options for childcare. Improving childcare recovery odds can potentially improve community recovery through facilitation of quicker business recovery due to lower parent absenteeism and potentially increase community resiliency and recovery rates.

In this chapter, I explore this topic in detail through an explanation of the research problem background and a concise statement of the problem and purpose of the study. I

articulate research questions, null and alternative hypotheses, and independent and dependent variables. I explain the theoretical framework, study nature, and concepts relevant to this research in depth. I define all applicable keywords. In this chapter I also discuss study assumptions, delimitations and study scope, and limitations. Prior to a chapter summarization, I also cover the study significance.

Background of the Study

Childcare is a significant element of American society. Childcare programs enable parents to work by providing a safe place for children during business hours (Warner, 2006). Not only does childcare provide economic value, it also provides social value. The childcare industry generates more than $41 billion a year in revenue and employs over 1.5 million people (Committee for Economic Development, 2015). This industry benefits the overall community economy. Childcare programs provide social value by teaching children how to interact with other individuals and the community (Warner, 2006). Childcare often supplements the positive or negative values being taught at home and sometimes serves as a child's first introduction to how to interact with adults and peers.

Children are acknowledged as the most vulnerable population during, as well as after, a disaster (National Commission on Children and Disasters, 2010; Peek, 2008). Research has shown that a key enabler in the postdisaster recovery of a child has been the restoration of a stable and safe routine (Bullock, Haddow, & Coppola, 2011; Peek, Sutton, & Gump, 2008). Children do have capacity to recover, but their recovery is often intertwined with the resilience of the systems and communities they interact with

(Wizemann, Reeve, & Altevogt, 2014). Recovery for children is often related to restoration of routine and a sense of normalcy, a return to a safe place where children are not constantly inundated with change and upheaval; establishment of this safe place is often a role childcare is uniquely suited for (Wizemann et al., 2014). Also tied to a child's recovery is the realization that the innate recovery capacity of children degrades as the time needed to restore services and enable community recovery lengthens (Wizemann et al., 2014).

Disaster recovery has adapted and expanded over time in the United States (Rubin, 2012). The primary policy that governs postdisaster assistance is the Robert T. Stafford Disaster Relief and Emergency Assistance Act, commonly referred to as the Stafford Act (2013). The Robert T. Stafford Disaster Relief and Emergency Assistance Act outlines the requirements and limitations for federal funding and provides for assistance of "essential services" that speed community recovery (p. 27).

Among the "essential services" included in the Robert T. Stafford Disaster Relief and Emergency Assistance Act (2013) are critical infrastructure and key resources and other services that enable state and local government and community functions, that is, power, water and sanitation, schools, public health, transportation, etc. Despite the National Commission on Children and Disasters' (2010) recommendation that childcare be designated as an essential service, this has not been acted upon, and thus, childcare as an industry or business classification remains typically ineligible for federal disaster recovery support (Federal Emergency Management Agency, 2016a; National Commission on Children and Disasters, 2010). Only public and nonprofit organizations

are eligible for Public Assistance recovery funding, and the majority of childcare programs in operation are forprofit, thus eliminating them from consideration for this recovery funding source (Federal Emergency Management Agency, 2016a).

Because childcare programs have not been designated as essential services, childcare programs are subject to the same limitations as any other local or small business. The three primary disaster recovery funding options for businesses are: insurance, private savings, or Small Business Association (SBA) disaster loans (Grace, Todd, & Darling, 2006). Because childcare programs typically operate on a thin profit margin with most revenue generated being primarily converted to employee salary expenses, there is normally not a large cash reserve built up (Wizemann et al., 2014). This low profit margin and lack of collateral often results in classification as "high risk" and impacts SBA loan qualification (Wizemann et al., 2014). Reliance on insurance also carries inherent risk, and, as childcare programs experienced post-Katrina, not all recovery costs are covered by insurance payouts (Grace et al., 2006). The need to relocate due to damaged facility structure and the need to meet new code requirements may also increase recovery costs. While detailed data on average childcare recovery timelines and the subsequent cost are not yet available, one year after Hurricane Katrina in Orleans Parish, Louisiana only 19.5% of childcare organizations registered prior to the hurricane had returned to operation (Jacobson, 2006). Sadly, 4 years post-Katrina, as of June 2009, that number had only increased to 51% (Senate Committee on Homeland Security and Governmental Affairs, Subcommittee on Disaster Recovery, 2009).

There is a lack of data on how childcare programs recover from disaster and how the recovery funding options available to them affect that recovery time. Superstorm Sandy highlighted the need to include childcare in planning in recovery efforts, but the true criticality of childcare has not yet been recognized as a standard in resilience planning (Wizemann et al., 2014). According to Save the Children, flooding in Louisiana in 2016 affected over 86 childcare organizations, and the number of affected childcare programs in states impacted by Hurricane Matthew is even greater (PR Newswire, 2016). While the criticality of childcare as a recovery enabler for children is becoming more obvious to the public, it remains unknown which types of childcare are currently best positioned to recover based on access to, and use of, recovery funding.

Problem Statement

Community postdisaster recovery is a long-term and very difficult undertaking (Federal Emergency Management Agency, 2011). The key step to enabling community recovery is the timely restoration of public services like power, water, transportation, and so forth. (Gilbert, 2010; Tierney, 2007). It is also acknowledged that a restoration of housing postdisaster is key to community recovery (Federal Emergency Management Agency, 2011; Gilbert, 2010). Hurricane Katrina highlighted another critical community recovery dependency. After lack of housing, lack of childcare was considered the next largest impediment to community recovery (Jacobson, 2006). Despite this, virtually no empirical studies on postdisaster childcare recovery exist to help understand the impact of disaster on childcare and the impact of childcare recovery failure on community recovery (Singletary, 2007).

The problem addressed in this study was childcare recovery. Childcare recovery impacts more than just the children who cannot return to the care of a given service provider. In the aftermath of emergencies or disasters, childcare failure can also impact business recovery. After Hurricane Katrina, the inability of parents to return to work due to a lack of safe childcare options impacted several significant energy sector businesses located on the Gulf Coast (Bullock et al., 2011). The resulting output disruption demonstrated how local childcare issues can quickly expand beyond the geographic limits of a given disaster (Bullock et al., 2011). Research on children and disaster also has indicated that a return to normal or the restoration of routine stability for children, such as a restoration of childcare services, can play a critical role in the postdisaster recovery of children (Bullock et al., 2011; Peek et al., 2008). A study that investigates childcare recovery and can provide some baseline data on what variables enable or inhibit recovery could benefit both the children affected by disaster as well as the disaster-affected community as a whole.

Purpose of the Study

The purpose of this quantitative study was to examine how childcare program recovery time varied as a result of childcare type and recovery funding used. I focused this study specifically on childcare programs impacted by Superstorm Sandy in New York, New Jersey, and Connecticut. There were two independent variables in this study. The first independent variable was the type of childcare (*CHILDCARE TYPE*). The second independent variable for this study was the type of recovery funding (*RECOVERY FUNDING*) used by the childcare. *RECOVERY TIME* was the dependent variable.

Research on childcare recovery is significant because of the role childcare plays in community resiliency. Without adequate and safe childcare, parents cannot meet work obligations, and with higher parent absenteeism postdisaster due to childcare recovery issues, businesses and community recovery is also affected.

Significance of the Study

Childcare is a significant part of a community. Identification and analysis of childcare recovery stumbling blocks or best practices can improve childcare recovery postdisaster. This research helps fill a gap in understanding of childcare recovery processes, success rates, and potential policy impediments. Analysis of the data from this study can help improve community recovery rates and thereby enable positive social change postdisaster. Childcare recovery rate improvement helps children, parents, the childcare industry, and other industries in the community recover faster. Childcare is not only important to parents, it is an economic enabler as an industry itself (Murrin, 2015; Warner, 2006, 2007; Wizemann et al., 2014). After a disaster, if parents cannot go to work because of a lack of childcare, community recovery will be affected (Bullock et al., 2011; Warner, 2006).

Significance to Theory

Resource dependence theory (RDT) traditionally has been applied to business firms (Davis & Cobb, 2010; Hillman, Withers, & Collins, 2009). Previous RDT research focused on explaining corporate engagement in ventures or mergers as a behavior meant to alter resource dependencies (Hillman et al., 2009). Application of RDT in this study allowed me the opportunity to test theory relevance against other organizations not

traditionally associated with the corporate construct. For example, childcare programs can be sole proprietorships operating from a residence, businesses operating in a rented or owned facility, church-based, or nonprofit organizations, and so forth. This study also tested the applicability of RDT in postdisaster survival situations, thereby more literally testing the theory of what organizations survive in a highly unstable situation (i.e., postdisaster).

The RDT assumption is that organizations, when faced with resource dependencies and increased uncertainty, will seek to control or mitigate those resources (Pfeffer & Salancik, 1978,, 2016; Ulrich & Barney, 1984). In this study I attempted to provide insight into whether or not childcare organizations that attempted to mitigate resource limitations through predisaster resource accrual or through recovery funding diversification fared better in postdisaster recovery times than those that did not. This study also provides interesting insight into which resources childcare programs are using for recovery and their assessment of value of these resources.

Significance to Practice

The 2010 National Commission on Children and Disasters identified the underprepared nature of childcare for disaster (National Commission on Children and Disasters, 2010). Given the noted lack of disaster preparedness in the childcare industry, it is not illogical to suspect that childcare programs are not prepared to recover from disaster either. This study helped fill a gap on current childcare recovery information and provided limited insight into how childcare programs recover from disaster through analysis of recovery funding used.

This study was significant because it evaluated how childcare program type and recovery funding used impacted the childcare program's recovery time. Postdisaster FEMA individual assistance funding is available for homeowners, but there is no public assistance routinely made available for childcare programs postdisaster (Federal Emergency Management Agency, 2016a). Because some childcare programs are nonprofits, are collocated within, or receive funding from, churches or state/federal agencies, they may have access to additional or different recovery funding options. By conducting this research and analyzing childcare programs recovery data rates, that is, how long it took childcare programs to recover after Superstorm Sandy and what recovery resources were used, it was possible to draw some preliminary conclusions about what resources were more commonly used by childcare programs and how childcare program owners or directors assessed the importance of these resources to their recovery experience.

Significance to Social Change

This study cannot prevent disaster. It cannot even mitigate it. It can, however, provide positive social value through the quantification of data that supports identification of critical obstacles or enablers of childcare recovery. Childcare provides part of the daily critical child infrastructure children depend upon during normal circumstances as well as postdisaster (Bullock et al., 2011). Ensuring that children have the resources they need to recover helps enable the resilience of an already vulnerable population (Bullock et al., 2011; Peek et al., 2008). Enabling childcare recovery also

enables community recovery by allowing parents to get on with the task of rebuilding their lives and returning to work (Bullock et al., 2011; Wizemann et al., 2014).

Public awareness is the first step in fixing a problem. Currently, little to no information is available that quantifies childcare recovery. There is no baseline data for childcare recovery. While there is a limited amount of small business recovery data available, few other small business sectors offer the social and economic benefits childcare does. The economic impact of childcare as both a job provider and job enabler has already been mentioned (Warner, 2006). Additionally, it is also critical to enable childcare because of its social value in the education and care of young minds and bodies (Warner, 2006). Without childcare, community life would be vastly different. In this study I investigated childcare recovery and provided baseline data on what resources childcare programs use in enabling their own recovery. I hope that this knowledge can help inform the development of postdisaster recovery policy recommendations for childcare. Development of more effective recovery policies that specifically help childcare benefits both children affected by disaster and the community at large and thus provides significant social change value.

Research Questions and Hypotheses

I used the following research questions and hypotheses were used to evaluate the variables in this study. My intent was to determine if application of RDT could help explain childcare recovery success or failure. Additionally, I wanted to determine what the relationship was between childcare type and recovery funding used in regard to postdisaster childcare recovery time. This research also provided answers to additional

questions about childcare recovery. These questions include determination of an average number of recovery sources used by childcare organizations and general childcare program perceptions about the value of various recovery resources based on the childcare type.

RQ1: What, if any, is the difference in recovery time when multiple forms of recovery funding are used?

$H_0$1: There is no difference in recovery time when multiple forms of recovery funding are used.

H_a1: There is a difference in recovery time when multiple forms of recovery funding are used.

RQ2: What, if any, is the difference in recovery time based on childcare type?

$H_0$2: There is no difference in recovery time based on childcare type.

H_a2: There is a difference in recovery time based on childcare type.

RQ3: What, if any, are the differences in recovery time based on number of categories of childcare recovery funding used?

$H_0$3: There is no difference in recovery time based on the number of categories of childcare recovery funding used.

H_a3: There is a difference in recovery time based on the number of categories of childcare recovery funding used.

RQ4: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy?

$H_0$4: Childcare type and recovery funding used do not predict recovery length with respect to Superstorm Sandy.

H_a4: Childcare type and recovery funding used do predict recovery length with respect to Superstorm Sandy.

I identified two independent variables and one dependent variable to help answer the aforementioned research questions. The first independent variable was childcare type and was a nominal, nonhierarchical variable. Childcare type included two categories: residential childcare and nonresidential childcare. The second independent variable was recovery funding. Recovery funding was a nominal variable and included three funding attributes: predisaster sources, postdisaster sources, or a combination of both. I address further definitions of independent variable categories in Chapter 3. The dependent variable for this study was recovery time and was measured in days (whole integer values). Recovery time was measured as a continuous variable.

Theoretical Foundation

In this study I attempted to explain how childcare type and recovery funding used impacted postdisaster recovery time. RDT was developed by Pfeffer and Salancik (1978) and remains one of the most recognized theories in use to explain how the environment affects an organization and its survival (Hillman et al., 2009). RDT rests upon several central propositions. First, it is based on the idea that an organization's behavior can best be understood through analysis of how that organization is influenced by, and interacts with, its environment (Pfeffer & Salancik, 1978). According to RDT, an organization's behavior cannot be divorced from the interactions, relationships, and interdependencies in

its environment (Pfeffer & Salancik, 2016). Pfeffer and Salancik (2016) define effective organizational behavior as the ability to gain and maintain resources. This mastery or control over critical resources is seen as a manifestation of organizational power (Pfeffer & Salancik, 2016; Ulrich & Barney, 1984).

The second and third propositions of RDT revolve around the central role of the environment as a provider of resources. The second proposition of RDT states that the environment an organization operates within provides it with certain key resources (Nienhüser, 2008). Third, RDT states that the environment is both a source of resources and a generator of uncertainty (Nienhüser, 2008). Uncertainty itself is not necessarily a problem for organizations. According to Pfeffer and Salancik (1978), when dependencies on certain resources combine with an increased, or a perceived increase, in uncertainty, organizations take steps to either reduce their uncertainty or resource dependence (Nienhüser, 2008).

There are two central assumptions of RDT. The first assumption is that organizations are made up of factions, or coalitions, that form as a result of interaction among individuals (Ulrich & Barney, 1984). These coalitions influence the organizational behavior (Nienhüser, 2008; Ulrich & Barney, 1984). The second assumption of RDT is that successful or effective organizations want to either decrease their dependence on resources or increase external organizational dependence on their organization as a goods or services provider (Nienhüser, 2008; Ulrich & Barney, 1984).

In this study I essentially tried to explain how the resources a childcare program has or uses affects its recovery time. I also tried to determine how the childcare type itself

limited or increased access to or availability of disaster recovery resources. RDT could provide a plausible explanation for why some childcare programs recover faster from disaster than others because it looks at resource dependencies and organizational survival (Pfeffer & Salancik, 1978).

Central to this study were the questions of how resource availability and utilization impacted the postdisaster recovery, or survival, of childcare programs. RDT postulates that only effective organizations survive, and because of its history of organizational analysis rather than the analysis of individuals, it was well suited to provide a theoretical framework for this study (Pfeffer & Salancik, 2016). Organizational survival or recovery was the key focus of this research.

Businesses, not unlike individuals, vary in their preparedness and vulnerability to disaster. Business vulnerability can be altered through resiliency building, including increased resource redundancy and building up of cash reserves prior to disaster (Tierney, 2007). In this study I tried to determine if the efforts made by childcare programs to gain or increase disaster recovery resources prior to disaster impacts recovery time. I also looked at whether individual childcare program access to postdisaster recovery resources varied based on the childcare type. Essentially, with this study I hoped to test whether or not RDT could help determine if childcare programs that engaged in disaster resource mitigation or diversification activities recovered faster than childcare programs that did not. For example, I explored if the creation of a disaster recovery or rainy-day saving fund and obtainment of adequate insurance, combined with application for all public recovery funding support, could help a childcare program return to operations faster than

others that did not seek to reduce uncertainty by setting aside additional predisaster resources. This theory was tested through application of a survey to childcare programs impacted by Superstorm Sandy and analysis of various demographics that might determine if predictions could be made about which childcare types recovered faster.

Nature of the Study

This study was a quasi-experimental quantitative study. The quantitative research method was most appropriate because I designed the research questions to ascertain variable relationships (Frankfort-Nachmias, Nachmias, & DeWaard, 2015). Because of the nature of this research, use of an experimental or quasi-experimental method with variable manipulation was not possible or desired. However, the application of a quasi-experimental method that did not manipulate the independent variable was desired. I used a causal-comparative quasi-experimental model to explain the consequences of one or more independent variables on the dependent variable (Fraenkel, 2006; Frankfort-Nachmias et al., 2015; Wayne & Boissoneau, 1996). Because this study did not manipulate variables or the operating environment, and because this study attempted to determine how the independent variables impacted the dependent variable, the causal-comparative model was best suited. This research design was ideal for evaluating data from a specific period in the past, where the variables could not be manipulated, and preexisting groups (i.e., childcare programs impacted by Superstorm Sandy in 2012) apply.

In this study I explored how two independent variables impacted a continuous dependent variable. The first independent variable was childcare type, which described

licensed childcare categories (e.g., residential and nonresidential) in New York, New Jersey, and Connecticut. The second independent variable was funding used for recovery (e.g., predisaster sources, postdisaster sources, or a combination of both). The dependent variable in this study was recovery time. Recovery time was measured by the whole integer number of days a childcare program took to return to operations.

The sample unit for this study was a childcare program. The sample population for this study was drawn from the population of childcare organizations in New York, New Jersey, and Connecticut impacted by Superstorm Sandy. Coordination with multiple agencies was necessary, and with this coordination I failed to obtain a specific list of affected childcare programs. What I obtained was a list of childcare programs in operation in the affected area during Superstorm Sandy. I used a probability sample strategy with a stratified sampling method to help prevent skewed results. I collected data via surveys of aforementioned childcare program directors/owners. Once collected, I analyzed this primary data with SPSS using one-way and factorial analysis of variance (ANOVA) techniques, as applicable to the research questions asked.

Definitions

Business continuity: Business continuity is defined as the ability of an organization to continue to function at predetermined capacity following a disaster or disrupting event (International Organization for Standardization, 2012).

Childcare: Childcare is defined as the provision of care or supervision of children by a provider other than the parent (Laughlin, 2013).

Childcare type: For the purpose of this dissertation, childcare type is defined as either residential or nonresidential. Further definition of variable categories is provided in Chapter 3.

Critical child infrastructure: Critical child infrastructure is defined as the components in a society that provide resources for children (Bullock et al., 2011). These critical services include facilities and services such as schools, childcare organizations, social services, before- and aftercare facilities, and physical and mental health services (Bullock et al., 2011).

Diversification: Diversification is a type of buffering, discussed in business terms as a way to mitigate dependencies on single sources or markets (Sheppard, 1995).

Effective organizations: Effective organizations are defined as those organizations able to create or adapt their actions to ensure successful outcomes (Pfeffer & Salancik, 1978, 2016). For the purpose of this dissertation this included the successful outcome of organizational survival postdisaster.

Impacted by Superstorm Sandy: For the purpose of this dissertation, impacted by Superstorm Sandy refers to those childcare organizations that were closed due to damage resulting from Superstorm Sandy.

Insourcing: Insourcing was defined by Drees, Pursey, and Heugens (2013) as a resource dependency reduction tactic that looks internally to build capacity or increase critical resources. For the purpose of this dissertation, I viewed it as a resource diversification tactic.

Mitigation: Mitigation refers to the actions taken to minimize or remove risks to property or people due to disaster (Haddow, Bullock, & Coppola, 2008). While the tools of mitigation vary in their application and availability, one aspect includes the goal of greater economic security within a community (Bullock et al., 2011; Haddow et al., 2008).

Recovery: Recovery is defined as the restoration of community resources defined as critical to economic and social stability and sustainability postdisaster and also includes measures to strengthen identified weaknesses (Federal Emergency Management Agency, 2016b).

Recovery funding: For the purpose of this dissertation, recovery funding is defined as predisaster sources, postdisaster sources, or a combination of both. Further definitions of variable categories are provided in Chapter 3.

Recovery time: For the purpose of this dissertation, recovery time is defined as the number of days for a childcare to return to operations.

Resilience: Resilience is defined as the capacity to deal with, and recover from, an emergency or disaster event (Federal Emergency Management Agency, 2016b).

Assumptions

This quantitative study began with several assumptions. The first assumption was that I, as the researcher, would be objective. A second assumption was that I would adhere to agreed-upon data collection and analysis protocols to ensure appropriate data treatment (see Hathaway, 1995). I also assumed that the research problem could be studied objectively. Because this was a quantitative study, I assumed that the research

results could be replicated and that the sample population in this study could be generalized to reflect the overall childcare program population.

I also made assumptions about the survey participants. I assumed that access to participants of both categories of childcare was available. I assumed that the data collected by the survey participants would be honest and correctly reflect their experiences. Survey participants were assumed to in fact be the childcare directors or owners of the survey unit childcare and therefore in a position to accurately provide the requested data.

Scope and Delimitations

For this study, I set certain delimitations. First, I studied only childcare programs impacted by a specific disaster, Superstorm Sandy. This was not because other disasters did not merit study, but instead to create a manageable data set that explored how a large disaster impacted a given population across three distinct states. The delimitation of three states provided the study comparative depth in assessing the different experiences of childcare organizations while still managing scope. This study included only licensed or registered childcare within New Jersey, New York and Connecticut. External validity may be supported through the conduct of this study concurrently in all three locations, and the data may be analyzed for result similarity compared to concurrent studies in different locations to see if the results are comparable (see Frankfort-Nachmias et al., 2015).

While it is understood that other childcare programs provide unregulated childcare, access to that group of childcare programs would have been difficult. There

was no way to establish a stratified sampling method that would be inclusive of that group. Additionally, inclusion of that population would have changed the study sample set from a finite to an infinite population, which is why it was excluded.

This study was quantitative in nature, and I deliberately selected childcare programs as the sample unit. Because this study used childcare as the unit of analysis rather than an individual, several internal validity threats were mitigated (see Frankfort-Nachmias et al., 2015). I deliberately sought participants who were childcare owners or directors and did not extend survey inclusion to all childcare providers within a given childcare. This exclusion was to ensure that the study focus remained on the business recovery process of the childcare rather than the individual experiences of childcare providers during recovery. Individual experiences in the recovery process are worthy of further exploration, but they were not addressed in this study.

Limitations

There were several study limitations. The first limitation was the amount of time that had passed since the event occurred in 2012. Because of this time lapse, survey participants may no longer have the information requested accessible, and this need for them to find answers potentially impacted the accuracy of information or participation in the survey itself. Second, this study measured recovery time, but it did not allow for explanations of delay for recovery funding application, or inefficiencies due to delayed recovery funding to childcare programs applying for support. Another limitation considered was access to childcare impacted by Superstorm Sandy. It was not possible to determine if childcare programs invited to participate in the survey were impacted by

Superstorm Sandy. Additionally, childcare programs that went out of business as a result of Superstorm Sandy could not be reached for inclusion in this study, and this omission might have affected the sample frame.

The weakness of the measuring instrument was a significant limitation. A questionnaire needed to be developed for this study, and the potential for bias in wording or ambiguity of interpretation cannot be ruled out. Consultation with subject matter experts mitigated a significant amount of wording bias or ambiguity and helped address validity issues.

This study used RDT to attempt to understand childcare recovery. A core assumption of RDT is that organizations develop coalitions or social arrangements, both internal and external, to influence behavior and control resources (Ulrich & Barney, 1984). This study focused specifically on the impact of a disaster on childcare programs. The existence of coalitions did nothing to address the principle research questions about funding sources, and thus in this study I did not seek to prove the existence of childcare coalitions or define their composition. It was not within the scope of this study to try and ascertain what combinations of internal influences impacted organization behavior, but instead to focus on the analysis of resource availability and how that availability and access impacted organizational recovery success.

Summary and Transition

Postdisaster community recovery is a complex and long-term issue (Federal Emergency Management Agency, 2011, 2016b). Community recovery dependencies on childcare recovery have either not been previously been identified, well-articulated, or

only superficially addressed. Childcare enables parents to work (Murrin, 2015; Wizemann et al., 2014), yet it is not enabled as an industry to recover quickly from disaster. Childcare has been likened to a "generator" that helps turn back "on" the economy in a disaster affected area (Save the Children, 2007). Without childcare, many economic sectors can, and do, suffer (Bullock et al., 2011).

Without recovery funding assistance childcare recovery can take time. After Hurricane Katrina, just 52 of 266 childcare organizations in Orleans Parish, Louisiana, reopened the next year (Jacobson, 2006). Understanding how childcare recovers and how resource access and limitations impact the recovery is critical to identification of potential areas for improvement. Failure to identify and address the issues childcare programs face in postdisaster recovery is a failure to increase community resilience and speed community recovery.

I review the literature and previous research on the impact of disaster on children, childcare preparedness for disaster and childcare recovery postdisaster, business continuity, and disaster recovery funding and policies in Chapter 2. I also expand upon the theoretical framework and address literature gaps.

Chapter 2: Literature Review

Community recovery following a disaster is a long-term process without guarantee of success (Federal Emergency Management Agency, 2011; Murrin, 2015; Myers & Mendel, 2014). The first steps in enabling community recovery lies in the quick restoration of public services such as power, water, transportation, and other services that enable businesses and individuals to begin initiation of recovery requirements (Gilbert, 2010; Tierney, 2007). One critical requirement of community recovery has recently been identified as restoration of housing postdisaster (Federal Emergency Management Agency, 2011; Gilbert, 2010). In addition to highlighting the criticality of housing postdisaster, Hurricane Katrina highlighted lack of childcare as the second largest impediment to community recovery (Jacobson, 2006). Despite this revelation, little to no empirical data exists on postdisaster childcare recovery rates or their impact on community recovery (Singletary, 2007).

The purpose of this quantitative study was to examine how childcare program recovery time varied as a result of childcare type and recovery funding used. This study was focused specifically on childcare organizations impacted by Superstorm Sandy in three states: New York, New Jersey, and Connecticut. I measured two independent variables, type of childcare and the type(s) of recovery funding used by the childcare. I assessed these independent variables in regard to their impact on the dependent variable of childcare recovery time.

This chapter addresses the importance of childcare both to society and to children themselves, especially after a disaster. This literature review begins with an analysis of

RDT and its applicability to this study. Following that is a review of current literature pertaining to children and disaster. I address the vulnerability of children both mentally and physically to disaster. Next, I present a review of literature associated with the ability of children to recover or mitigate the damage caused by disaster. This is key as it helps explain the importance of childcare and other critical infrastructure for children. I then discuss the impact and position of childcare in the community. Analysis of the literature concerned with the role of childcare before, during, and after disaster follows. I also explore resiliency and disaster recovery policies, definitions, and funding options. I cover literature related to childcare recovery and the needs of childcare. This analysis of the literature on children and disaster, the importance of childcare for children, and the research available on business recovery postdisaster will reveal the conspicuous absence of data on childcare postdisaster recovery. The extensive literature review in this chapter highlights that little data exists that addresses how childcare recovers from disaster. Further, this analysis reveals that no data exists to help explain how childcare type influences recovery time. My intent for this study was to at least partially fill these gaps.

Literature Search Strategy

I developed a search strategy that covered multiple disciplines and continuously revised it based on results obtained from various psychology, medical, policy, government, science, business, and education electronic databases—specifically, ProQuest Central, PsycINFO, SAGE Journals, Political Science Complete, SocINDEX with Full Text, Business Source Complete, ScienceDirect, Military and Government Collection, Thoreau Multi-Database Search, Child Care & Early Education Research

Connection, ERIC, PubMed, MEDLINE with Full Text, Academic Search Complete, and Google Scholar. I principally sought peer-reviewed journals from 2013-2018 for inclusion in this study, but some policy documents predated this period. Additionally, reporting of similar Superstorm Sandy disaster impacts predated this period as they correlated with Hurricane Katrina, which hit the United States in 2005. The use of news reports or nonpeer-reviewed articles was limited; they are included primarily to provide background or scene setting information that informs the peer-reviewed articles. Because disaster relief policy is frequently adapted as a result of postdisaster lessons learned, search parameters for disaster policy and funding searches were not confined the aforementioned 5 year time period.

There were difficulties in finding articles that specifically addressed childcare recovery, so I researched a variety of relevant and similar topics and employed multiple search word strategies to provide insight with this study. Initially, I conducted searches focusing on the terms of *childcare, child care*, and *recovery*, but I found no results. I expanded the searches to include the following words in various combinations: *children, disaster, recovery, vulnerability, policy, preparedness, preschool, daycare, emergency, funding, pre-school, nursery, resilience, disaster recovery, disaster response, infants, preschoolers, toddlers, business recovery, business continuity, business vulnerability, resource dependence, resource dependency, childcare providers, society,* and *survival.*

Theoretical Foundation

RDT was developed by Pfeffer and Salancik (1978) and remains one of the most recognized theories in use to explain how the environment affects an organization and its

survival (Hillman et al., 2009). RDT postulates that organizations are influenced by their environment, and to be successful, they must mitigate their resource dependencies (Hillman et al., 2009; Pfeffer & Salancik, 2016; Ulrich & Barney, 1984). RDT defines organizations that can control or limit resource dependencies through a variety of techniques as effective (Pfeffer & Salancik, 1978; Pfeffer & Salancik, 2016). I designed this study to look at survival, or recovery, of childcare programs postdisaster. Because the unit of measurement in this study was an organization rather than an individual, and because in this study I sought to understand resource constraints or how limitations might impact recovery, RDT provided a logical framework from which to analyze organization success or failure. RDT could also provide a plausible explanation for why some childcare programs recover faster from disaster than others through its framing of survival as a result of effectiveness (Pfeffer & Salancik, 1978).

There are several propositions central to RDT. First, RDT states that an organization's behavior can only be understood through analysis of the environmental influences that impact an organization and that organization's subsequent reactions to said influences (Pfeffer & Salancik, 1978). According to RDT, an organization's behavior cannot be viewed separately from these interactions, relationships, and interdependencies because these items form the core stimulants of organizational behavior within the environment itself (Pfeffer & Salancik, 2016). The society in which an organization operates, its social environment, helps predict its behavior (Davis & Cobb, 2010).

A second proposition revolves around the central role of the environment as a resource provider. RDT asserts that the organization's operating environment will be the source of certain key resources (Nienhüser, 2008). RDT proposes that these resources are often finite and beyond the control of the organization dependent upon them (Pfeffer & Salancik, 2016; Ulrich & Barney, 1984). Pfeffer and Salancik (2016) judge organizations as effective based on their ability to manage the resulting resource dependence. External resource acquisition strategies are an essential part of long-term management and organizational goal achievement (K. K. Powell & Rey, 2015). This management and mastery of finite resources or dependence on external organizations for critical resources is an indication of organizational success, and ultimately, survival (Pfeffer & Salancik, 2016; Ulrich & Barney, 1984).

Third, RDT defines the environment as a generator of uncertainty (Nienhüser, 2008). Uncertainty itself is not a problem for organizations; but when dependencies on certain resources combine with an increased, or a perceived increase in uncertainty, RDT postulates that organizations will take steps to reduce either uncertainty or reduce resource dependence (Klein & Dinez Pereira, 2016; Nienhüser, 2008).

There are two central assumptions of RDT. The first assumption is that organizations are made up of factions, or coalitions, that form as a result of interaction among individuals (Ulrich & Barney, 1984). These coalitions influence the behavior of the organization (Nienhüser, 2008; Ulrich & Barney, 1984). The second assumption of RDT is that successful or effective organizations want to either decrease their dependence on resources else increase external organizational dependence on their organization as a

provider of goods or services (Nienhüser, 2008; Ulrich & Barney, 1984). Achievement of this goal has also been identified as an example of how an organization could increase its power (Hillman et al., 2009; Nienhüser, 2008; Pfeffer & Salancik, 1978; Pfeffer & Salancik, 2016; Ulrich & Barney, 1984). Based on this assumption, an organization is assumed to behave in ways designed to meet this desired end state, else it chooses to accept a degree of uncertainty with its given environment and this acceptance is judged as it's degree of comfort with its level of power in that given environment (Nienhüser, 2008; Ulrich & Barney, 1984).

There are several strategies that organizations have taken to lower resource dependencies. According to RDT, a key manifestation of mitigation strategy has been organizational engagement in interorganizational relationships such as mergers and acquisitions, alliances, and joint ventures (Drees et al., 2013; Hillman et al., 2009; Klein & Dinez Pereira, 2016). Another way resource dependence mitigation is undertaken is through the utilization of insourcing or diversification of resources. Drees et al. (2013) defines insourcing as a tactic that looks within an organization to build capacity or increase critical resources. Diversification of resources is another mitigation strategy designed to limit overdependence on a single resource or market through the attainment or creation of alternate resources (Nienhüser, 2008; Sheppard, 1995).

RDT has been used to study the cooperative behaviors of corporations (i.e., why corporations form or dissolve relationships) (Davis & Cobb, 2010; Drees et al., 2013). Utilization of RDT in these studies has indicated that organizations, usually corporations, depend on certain resources and some of these organizations form a dependency upon or

with the organization providing the resources; further, analysis has shown that this dependence is often not one-sided (Drees et al., 2013). Application of RDT has demonstrated that there is a positive correlation between resource dependence and certain corporate behaviors like insourcing, mergers, and other joint venture or acquisition-type actions (Drees et al., 2013; Hillman et al., 2009). The effects noted in these studies were often small, less than .30, but they were still significant (Drees et al., 2013; Zhang, Lindell, & Prater, 2009). In a related study, a .01 correlation was noted between resource dependence and insourcing specifically as an undertaken resource dependency mitigation strategy (Drees et al., 2013). RDT also has been historically used to explain why businesses acquisition is undertaken (Hillman et al., 2009). RDT explains business acquisition as a form of dependency mitigation. Pfeffer and Salancik's (1978) research demonstrated that mergers occurred more often in industrial areas where uncertainty and resource dependence were high (Nienhüser, 2008). RDT has been applied to various nonprofit or public service organizations as well (K. K. Powell & Rey, 2015). Two of these noncorporate sectors include higher education and healthcare (K. K. Powell & Rey, 2015). RDT has been utilized to help explain organizational survival through a strategy of revenue stream diversification (Doyle, Kelly, & O'Donohoe, 2016). Diversification of resources in periods of resource scarcity is another strategy that RDT predicts (Nienhüser, 2008; Sheppard, 1995). Ulrich and Barney (1984) also noted that some organizations mitigate their dependence by increasing the dependence of other organizations upon themselves; highlighting the example of how the United Way, as an

organization, that has done this through generation of alternative revenue that allows it to be a grantor of funding to other organizations.

Determination of the most appropriate theory to encapsulate this research was not easy. Initially, business vulnerability seems a good fit for this study. Research had been conducted that examines preexisting conditions of business as a predictor of business recovery postdisaster. Several theoretic business vulnerability models have been proposed through academic research to explain business vulnerability and its impact on disaster recovery (Marshall, Niehm, Sydnor, & Schrank, 2015; Marshall & Schrank, 2013; Tierney, 2007; Wasileski, Havidán R., & Diaz, 2011; Webb, Tierney, & Dahlhamer, 2002; Zhang et al., 2009). This micro characteristic view has provided interesting insight into disaster recovery, but its conclusions have often been contradictory.

Utilization of business vulnerability theory could not fully capture the intent of this study because it is been more micro characteristic based. While business vulnerability theory did help fill the gap left by traditional disaster research that focuses on either the recovery of individuals and family units or the community at large, it still fell short of the desired intent of this study (Webb et al., 2002; Zhang et al., 2009). RDT helped close the gap by placing the unit of analysis squarely on the organization. This organizational focus allows a detailed analysis of the differences in organizational behavior, and potentially composition (i.e., childcare type) to become predictors of disaster recovery.

The research questions for this study helped expand RDT through application of its tenets to a business, but less corporate model. The study also sought to explain whether individual childcare program's access to postdisaster recovery resources were impacted by childcare type and if this potential limitation could be mitigated through the aforementioned technique of resource diversification or insourcing. This study could expand application of RDT through analysis of organizational struggle through the more literal postdisaster recovery example rather than traditional day to day operations. In essence this study shock-tests the applicability of RDT when the environment is in its highest state of uncertainty resulting from some unexpected catastrophe.

Literature Review

The Local Disaster Lens

Disasters are inherently local and any theory of how events transpired or what behaviors or actions were effective or not must first be viewed through the lens of a specific disaster. Superstorm Sandy was chosen to be the lens for this study due to its impact across multiple states and a sufficient passage of time to allow for some research to have been conducted and made applicable to this study. In October 2012, Superstorm Sandy hit the eastern coast of the United States and caused significant damage from winds and widespread flooding (Murrin, 2015; Phillips, 2016). Somewhere between 60,000 and 100,000 small businesses were impacted (Sullivan, 2017). Almost 700 childcare programs were closed long-term in Connecticut, New York and New Jersey (Murrin, 2015; Wizemann et al., 2014). Almost 11,500 of the over 21,000 registered childcare programs in the state of New York were impacted (Wizemann et al., 2014).

Wizemann et al. (2014) did not explain what is meant by "impacted" but it can be assumed that it covered minor impact such as loss to power to greater impact caused by storm damage. Because Superstorm Sandy impacted a diverse geographic location, it provided an ideal context to study if childcare type influenced recovery and to test aforementioned resource dependence assumptions. To begin to determine this, the research on children and disaster must first be addressed. Next the literature review will provide information on childcare as an industry and of its value to society. Following that, review of all research found related to childcare and disaster will be conducted. Further, resiliency and disaster recovery definitions, policies, and funding options will be discussed. Ultimately all available research on childcare recovery will be presented, and the existing gap outlined that will validate the need for this study.

Children and Disaster

There has been a relatively robust effort to provide research on the topic of children and disaster overall, however the principal focus of that research has been on physiological and physical impacts of disaster on children. Within that category, very little of the research utilized test subjects five years old or younger. While their increased vulnerability as a population logically precludes application of many of the traditional testing, or application of treatments, as seen in studies conducted on adults, this omission is significant. To better understand the impact of childcare recovery, it is vital to first understand how children themselves are impacted by disaster. A chronological review of the literature on physical and emotional vulnerabilities of children and the observed impacted will be conducted. Next, analysis of smaller body of growing literature on the

ability of children to mitigate disaster, or increase their own resiliency capabilities will then be addressed. Finally, research related to the recovery of children will be reviewed.

Physical and emotional vulnerabilities of children to disaster. Children are acknowledged and often cited as the most vulnerable population before, during, and after disasters (Murrin, 2015; National Commission on Children and Disasters, 2010; Peek, 2010; Peek & Stough, 2010; Pfefferbaum et al., 2013; Pillai & Sekar, 2013; Wizemann et al., 2014). As a population group, children comprise almost 25% of the population within the United States (National Commission on Children and Disasters, 2010; Peek, 2008). The United Nations estimates that over half of the people impacted by disaster are children or youth (youth being defined as individuals 18-25 years old) (Fletcher et al., 2016). The needs of children during a disaster are different than the needs of adults (Yonekura, Ueno, & Iwanaka, 2013). During the earthquake, tsunami, and nuclear disaster in Fukushima Japan for example, almost seven percent of the fatalities were children, and children comprised almost 30% of all patients seen by disaster medical assistance teams (DMATs) (Yonekura et al., 2013). One third of the population of Orleans Parish, New Orleans, was under the age of 18 when Hurricane Katrina hit the United States (Shahinfar, Vishnevski, Kilmer, & Gil-Rivas, 2010).

Children are vulnerable not only due to their cognitive and physical limitations (as compared to an adult), but also due to their social state (Zahran, Peek, & Brody, 2008). For example, over 30% of children six years old and under lived in poverty in the state of Louisiana when Hurricane Katrina hit (Pfefferbaum, Pfefferbaum, & Norris, 2010). Age coupled with economic status and social capital strength (the network of relationships one

has that can help influence circumstances, or mitigate dependencies on government programs) can make an already vulnerable population even more vulnerable (Phillips, 2016). In additional to physical and mental vulnerabilities, disaster often creates new safety and security vulnerabilities that need to be addressed to aid children both during and after the disaster (Bullock et al., 2011). Research has shown that disruption of routines for young children and separation from primary caregivers causes additional distress and impacts how a child responds to, and ultimately recovers from, disaster (Masten & Narayan, 2012).

In 2000, a researcher used her case experience with flood victims to help illustrate how children, including preschool children, respond to disaster through the cognitive developmental theory (Deering, 2000). Preschool age children process events on the sensory level primarily and often tend to get overwhelmed and personify objects (Deering, 2000). They can understand things better through comparison, storms are "monsters," and germs are "bad guys." Deering (2000) highlighted examples of previous research where this age group reacted to disaster through a heightened level of anxiety, separation issues, trouble sleeping, and other behavioral changes. This early research is limited as it only presents one case study for each age group, preschool and school age children. There is no rigorous methodology employed, but it helps highlight the difference between the reactions of preschool children and school age children both during and postdisaster.

Peek (2008) provided a good breakdown of the types of psychological, physical, and educational vulnerabilities children face during or because of a disaster. Physically,

children are at risk of injury, death, and illness as well as heat stress, malnutrition, or even physical or sexual abuse (Peek, 2008). Emotionally or psychologically children could suffer from anxiety, depression, trouble sleeping, emotional or behavioral issues or even PTSD (Belfer, 2006; Berson & Baggerly, 2009; Peek, 2008). Due to the aforementioned vulnerabilities and the dependence of children on others who may also be suffering from postdisaster stressors, they can be vulnerable academically through missed school, affected performance, and potentially failure to complete their education (Peek, 2008). The disaster experience combined with the predisaster conditions in which a child lives will affect his or her ability to recover (Fothergill & Peek, 2015; Peek, 2008). It is critical to understand to role of the supporting infrastructure children rely upon as well as understand how changes to these systems and events themselves can impact children.

Scheeringa and Zeanah's (2008) study is one of only a handful that addresses PTSD and comorbidity of preschool children post-Katrina. The study evaluated two groups, those who stayed during Hurricane Katrina, and those who evacuated. The mean age for each group was 4.7 and 5.4 years old respectively (Scheeringa & Zeanah, 2008). Scheeringa and Zeanah's (2008) research was significant in that they applied diagnostic interviewing and evaluation criteria developed specifically for the preschool age child (Scheeringa & Zeanah, 2008). This study was unique as one of a limited number of postdisaster impact studies whose study population was comprised of preschool children and their caregivers. The application of different evaluation criteria cited here was not highlighted significantly in further research, nor is the psychological impact of evacuation on children prominently mentioned in future studies. However, extrapolation

of future research indicates a later recognition on the importance of a return of routine and stability for young children. Perhaps this study was embryonic of that later realization and can partially explain the high rates of mental health issues for children who evacuated and theoretically did not experience the full exposure impact of Hurricane Karina.

Limited studies have been conducted on the impact of disaster on preschool age children and have indicated the appearance of postdisaster behavioral issues (Boer, Smit, Morren, Roorda, & Yzermans, 2009). Boer et al. (2009) conducted a longitudinal study on the impact of the Enschede fireworks disaster on children ages 4-9 at the time of the event. The impetus of the study was the May 2000 explosion of a fireworks depot in the Netherlands which resulted in 22 dead, 1,000 injured, and 400 homes lost (Boer et al., 2009). The results of this study seems to suggest that preschool children who experience trauma have different long-term effects than children who initially experience the trauma at a later age in life (Boer et al., 2009). The study admits to several limitations, chiefly a low response rate, and the proclivity of parents of victims to be more sensitive to potential problems and report them as such than parents of children who were not exposed to the disaster (Boer et al., 2009).

This study was significant as it is one of the few longitudinal studies conducted on young children that spans five years of postdisaster healthcare. Like many studies on children and disaster, it relied on the observations of parents to note problems, potentially bringing in bias or hypersensitivity of reported symptoms. It did not address the application of additional variables or evaluations by nonparents on issues like conduct of

the affected child. The application of a strong, nurturing school or childcare environment or a stable routine was also not addressed in this study.

Chemtob et al. (2010) further closed the gap on literature about children and disaster through a study on the effect of maternal depression on preschool children after 9/11. Previous studies studied the impact on either older children, or relied solely on the self-reporting of mother's about their child's behavior or post-traumatic stress symptom (PTSS) indicators (Chemtob et al., 2010). Chemtob et al.'s (2010) research is interesting in that it not only looked at the direct impact of disaster on children, already documented to be significant, but also the indirect impact of how a mother reacts to the disaster and how her stress manifests or is experienced by her young child. Chemtob et al. (2010) study evaluated 116 mother-child dyads and included children who had been in preschool or childcare (children ages 5 or under) at the time of the attack. The results indicated that children whose mothers had neither PTSD or depression had less behavioral problems noted by mothers and teachers; mothers with depression but not PTSD had children with more behavioral problems, and the children of mothers with depression and PTSD expressed the most behavioral problems (Chemtob et al., 2010).

Chemtob et al.'s (2010) research, while not directly linked to childcare recovery, provided some limited evidence of how disaster impacts children of childcare age and how a mother's disaster experience can impact her own child's behavior and recovery. Chemtob et al. (2010) correctly admits that there were study limitations and that more work is needed in this field to better identify recovery trajectories of young children. Despite this, highlighting how the postdisaster parental mental health impacts young

children was instrumental to help demonstrate the value of childcare. A mother cannot get mental health help if she does not have the needed resources and is not identified (either self-identified or via referral) as needing help. Concurrently, she cannot get mental health help if there is nowhere to take her child while she is receiving that help. This need again stresses the importance of planning for the needs of children and their mothers in and after disaster (Gil-Rivas, Kilmer, Hypes, & Roof, 2010; Kelly, 1997; Scaramella, Sohr-Preston, Callahan, & Mirabile, 2008).

Kithakye, Morris, Terranova, and Myers' (2010) study looked at the impact of political disaster on preschool children in Kenya. It tracked the pre- and postdisaster aggression and prosocial behavior of 84 children (Kithakye et al., 2010). While this research was conducted outside the United States, its relevancy is in how a disaster impacted preschool children. This three month political conflict referenced resulted in over 1,000 deaths and the internal displacement of over 100,000 children (Kithakye et al., 2010).

The study had several limitations. First, while it had the benefit of utilizing predisaster data, it did so because the children in the study had already been identified as at risk: e.g., parents with HIV, extended unemployment of parents, etc. Also, the study did not include an analysis of what combination of dependent variables, loss of home, death of parent, witnessing harm to parent, injury to child, etc., had a greater or lesser impact on a child's postdisaster aggression or prosocial behavior. Reliance on teacher reporting introduced a potential bias because parents could not corroborate teacher-noted

behaviors. Despite the study's limitations, the results still provided some of the only data currently available on pre- and postdisaster behavior of preschool children.

Often research on the impact of disaster on children does not distinguish between age groups. Dogan-Ates (2010) reviewed early studies on the impacts of disaster on preschool, school age, and adolescent populations and compared the listed symptoms. Her review of research conducted by Baggerly and Exum (2008); Coffman (1998); Dyregrov and Yule (2006) and Starr (2002) shows a more consistent manifestation of behavior issues in preschoolers impacted by disaster rather than the traditional noted post-traumatic stress symptoms. Saylor, Swenson, and Powell (1992) conducted one of the most extensive studies on preschool children and included the evaluation of 278 children in regards to their Hurricane Hugo experience (Dogan-Ates, 2010). The results of that study demonstrate that young children who experience trauma from disaster are likely to show more generalized fear responses, behavior changes which could include increased dependency, problems sleeping (e.g., nightmares, insomnia, etc.,) or a proclivity to personify the disaster or be unable to engage in repeated episodes of talking about it (Dogan-Ates, 2010). This analysis of the unique nature of postdisaster emotional effects on preschool children strengthens the case to treat them, and the community infrastructure that supports them, differently than school age children and adolescents.

Like most disaster research on young children, quasi-experimental models are usually only employed when a preexisting study already in progress that can be modified to answer postdisaster assessment questions. The study conducted by Conway, MacKenzie, McDonough, Follett, and Sameroff (2013) is no different. A study had

already been underway in Michigan on stress and its impact on mothers and their children as they reached 15 and 33 months old respectively. During the course of this previous study, the terrorist attack (9/11) occurred in the United States. Conway et al. (2013) hypothesized that the assessments of 15 and 33 month old children and their mothers after the 9/11 attack would be different than those conducted on 15 and 33 month old children and their mothers prior to the attack.

These results indicate that three-year old children were impacted by disaster (Conway et al., 2013). The longitudinal and quasi-experimental nature of this study lends validity to its results, but at the same time limitations need to be acknowledged. Sample size limitations and the necessity of reliance on parental reporting could not eliminate the possibility of bias (Conway et al., 2013). Despite these limitations, this study negates the oft cited and incorrect assumption that children are not affected by things they cannot explain.

Abramson et al. (2015) conducted analysis of data drawn from the Sandy Child and Family Health (S-CAFH) study to look at several issues, including the health and wellbeing of New Jersey children who had experienced Superstorm Sandy. The study group consisted of almost 1,000 respondents, of which 300 reported having children within the home (Abramson et al., 2015). The study indicated that children who were living in homes damaged by Superstorm Sandy were four times more likely than children in the same state whose homes were not damaged to be sad, depressed, or have sleep issues (Abramson et al., 2015). This data analysis is interesting in that it highlights that children whose homes had minor damage were impacted more than those with major

damage. This analysis also shows that the mental health issues of the parent, or how they handle issues appeared to influence the mental health and recovery issues of the children, backing up previous research in this area (Abramson et al., 2015).

The research conducted by J. Osofsky, Kronenberg, Bocknek, and Cross-Hansel (2015) is one of the most comprehensive done on preschool age children to date; including 914 children aged 3 to 5 when Hurricane Katrina made landfall in Louisiana. J. Osofsky et al. (2015) conducted a longitudinal study with four measurement points spanning a total of four years. Previous research indicated that younger children (3-5 years old) do not have the cognitive skills or abilities to understand or translate their feelings about the traumatic events they have experienced in the same way older children can, thus potentially impacting their recovery potential (J. Osofsky et al., 2015; J. D. Osofsky, Osofsky, & Harris, 2007a, 2007b). J. Osofsky et al.'s (2015) research builds off previous mental health and post-traumatic stress impact research on children to expand understanding through its longitudinal approach (Chemtob et al., 2010; Navarro et al., 2014; J. Osofsky et al., 2015; Pillai & Sekar, 2013).

J. Osofsky et al. (2015) hypothesized that signs of trauma should decrease over time. The results indicated that their hypothesis was correct. The results also indicated that children whose exposure to the hurricane was greater, had multiple disruptions or separations from their primary caregiver, suffered losses such as evacuation or displacement from school, or had loss of a pet or toys, were worse off four years postdisaster than children who experienced fewer or no stressors in the aforementioned categories (J. Osofsky et al., 2015). The degree of significance of school displacement

was not called out specifically among the nonhuman losses, so the degree of importance is not specifically ascertainable. Despite this, this research reiterated again the importance of school or a stable routine to preschool age children.

Terranova, Morris, Myers, Kithakye, and Morris (2015) expanded the research on children and disaster beyond just looking at how well children recover in relation to the level of stress or depression their parents are undergoing as a result of a given disaster to include child temperament, in other words, emotional reactivity. Emotional reactivity was defined as a child's ability to maintain or shift focus, suppress negative responses and activate more adaptive or acceptable responses to handle stress (Terranova et al., 2015).

Consistent with previous studies, exposure to disaster and status of parent's mental health did impact children's recovery and reported behaviors. The collected data indicated that better emotional reactivity resulted in lower teacher-reported levels of aggression and higher reports of noticed prosocial behaviors (Terranova et al., 2015). The significance of this study was in its call for more studies on developing and encouraging emotional reactivity or resiliency behaviors in children. Almost 60% of children five and under spend a majority of their time (33-35 hours a week) in childcare environments (Laughlin, 2013). Enabling childcare to help build or enhance these capabilities makes sense, especially postdisaster.

Most studies on disaster and children are clustered around specific events, but surprisingly, very little research has been conducted on Superstorm Sandy. The study conducted by Quinn et al. (2016) was significant as it remains one of the very few conducted to date on Superstorm Sandy that includes a group of childcare age children.

This quantitative, cross sectional study had a goal of exploring how Superstorm Sandy impacted children in New Jersey (Quinn et al., 2016). The survey sample is small, n=141, of which only 14 were in the 0 to 5 years old age group. Thirty five percent of the 0-5 year group was reported to have experienced behavioral changes; such as separation anxiety, or clinginess (Quinn et al., 2016). Roughly the same number of parents indicated a change in play behavior for preschool aged children and an increased fear of being alone, even for small things such as using the restroom (Quinn et al., 2016).

This study population was small, but it demonstrates the same sort of results noted of older studies as to how young children are impacted by disaster (e.g., behavioral changes and anxiety) (Quinn et al., 2016). Additionally, Quinn et al. (2016) uses the study results to reiterate the importance of return to routine, both for the developmental needs of young children and the academic needs of older children.

Historically, researchers assumed that young children had a natural resiliency and did not experience significant effects from disaster because of their inability to fully comprehend the ramifications and actual causality of the event itself, but subsequent research has proven this assumption incorrect (Gomez & Yoshikawa, 2017; La Greca, Silverman, & Wasserstein, 1998; Masten & Narayan, 2012; Masten & Osofsky, 2010; Peek, 2008). Gomez and Yoshikawa (2017) conducted research to explore the impact of the 2010 Chilean earthquake on preschoolers. Their study included 1,418 children (Gomez & Yoshikawa, 2017). 698 of the children evaluated had experienced the earthquake, and 720 who had not made up the comparison group. The children were evaluated in language, literary, and math skills to see if the earthquake had had any

impact on skill assessments (Gomez & Yoshikawa, 2017). They also looked at parental stressors as a result of the earthquake to see if any correlation existed between amount of postdisaster issues being handled by caregivers and a children's performance (Gomez & Yoshikawa, 2017).

Their results indicated a small effect size of -0.19 for letter-word identification and an effect size significance of -0.22 (Gomez & Yoshikawa, 2017). There was no measurable significance for the other math or literacy tests noted (Gomez & Yoshikawa, 2017). Gomez and Yoshikawa (2017) indicate that there were differences between the groups that they tried to control for, like an average one month older age of non-earthquake experiencing children, and some missing data issues they mitigated. This survey is only a handful of those conducted that talked specifically to cognitive implications of disaster on children of childcare age. Admittedly, it was not a longitudinal study and the short-term impact of disaster on children's test scores needs to be researched in greater detail to determine if this trend continues. The study also highlighted a moderate significance between score outcomes and the stressors facing parents due to the disaster (Gomez & Yoshikawa, 2017). This study provided additional evidence of the importance of caregiver interaction on a child's postdisaster recovery and it builds upon Weissman and Jensen's (2002) previous research on the impact of maternal depression and its effect on children.

Children are not adults and do not react to disaster in the same way (Bullock et al., 2011; Wizemann et al., 2014). Disaster research is often fraught with limitations, specifically, a traditional lack of predisaster assessments. Research on children and

disaster has shown to be no exception to this (Masten & Osofsky, 2010). Despite this, research on children and disaster has continued to grow over the past two decades. The physical and mental vulnerabilities of children have been documented. Research has also focused on how the impact of disaster on caregivers and parents affect their young children. Understanding how children react to, and express, their reactions to disaster is an important first step in expanding disaster analysis. Expanding analysis on central components in a child's life, like caregivers, and the impact of disaster on those spheres can help highlight the criticality of childcare as a key enabler or crippler of a child's recovery from disaster.

Resiliency and recovery of children from disaster. Very little research has been conducted on the ability of children to mitigate disaster or increase resilience. Resilience is defined as the capacity to deal with, and recover from, an emergency or disaster event (Federal Emergency Management Agency, 2016b). Concurrently, there exists little work that tests the theory that children can increase or improve their own recovery rates. Despite that, a small body of growing data suggests that this area requires greater exploration. A number of studies have looked at the recovery of children from disaster, specifically analyzing how caregivers and recovery environments impact the resiliency and recovery capabilities of children. Previous assumptions that children are passive victims are being questioned and researchers are learning that children can play a role in their own resilience if given the proper tools and support (Mitchell, 2008; peek, 2008).

The last two decades have seen an increased or sharpened focus on not just the recovery statistics of children, but instead on what enables their recovery. Specifically,

the role of caregivers and providers of routine and security (i.e., schools, childcare, church, community services, etc.,) is being evaluated. Research has established the importance of routine reestablishment in recovery (Gil-Rivas & Kilmer, 2013; Masten & Narayan, 2012). The latest analysis confirms the complex nature of recovery and the interdependence of many infrastructure elements that support children and their needs.

Recovery for disaster-affected individuals with children is aided by the provision of support systems. Providing safe activities and support for children can enable parents to help reconstruct their lives (Varela, Hensley-Maloney, & Vernberg, 2010). Resuming predisaster activities and routines help children adapt to the postdisaster normal through the reintroduction of structure and the availability of adults to help aid the coping process (Varela et al., 2010). Childcare and school environments can help serve as critical infrastructure for this recovery support. According to Masten and Narayan (2012) the restoration of schools, childcare facilities and other safe places for children to play are second only basic survival needs in criticality to child recovery. Children need comfort after a traumatic event. The shape and scope of that comfort varies not just only upon the degree of trauma, but the age of the victim. Younger children will need more physical support, maybe through hugs or reassurances brought through maintaining proximity (Peek, 2010). The restoration of routine not only supports the needs of children, but also their parents to start the recovery rebuilding process (Masten & Narayan, 2012).

Peek et al.'s (2008) early field study of the Children’s Disaster Services (CDS) program offered by the Brethren Disaster Ministries of the Church of the Brethren General Board is instructive in documenting the need for specially trained emergency

childcare providers as well as highlighting the role childcare plays in a child's recovery from disaster. Evidence obtained from previous research indicates the significance of the parental role in facilitating a child's recovery from disaster, but also the importance of "support agents" like teachers, doctors, or other individuals that are a common part of a child's normal life experience (Peek et al., 2008). Peek et al. (2008) investigated the history and application of the CDS Critical Response child Care (CRC) teams in responding to a variety of disasters. CRC volunteers are trained and vetted childcare providers who deploy to disaster areas in support of the American Red Cross or FEMA (Peek et al., 2008). Their stated purpose is to enable the recovery of children (primarily 2-6 years old) through the provision of an environment conducive to free expression and encouragement (Peek et al., 2008). The CRC operates under the acknowledged premise that security and the perception is paramount and without it, resolution of other issues is not possible (Peek et al., 2008; Rosenfeld, Caye, Ayalon, & Lahad, 2005).

This field study stressed the importance of play as an enabler of healing, and cited examples of giving traumatized children a chance to express themselves through art and reenactment free play, both typically supported through a childcare environment (Peek et al., 2008). While this case study serves more as an introduction to bring attention to an underserved population and limited service provider pool, its researchers are well known and respected in the community for qualitative and interview work. This is one of only a handful or references that cite the importance of services specifically suited to benefit childcare age children and their families.

There has been some research on family stress and disaster and how that impacts children. Scaramella et al. (2008) conducted research on the family stress model through a disaster lens. Several years later, Gil-Rivas et al. (2010) and Peek, Morrissey, and Marlatt (2011) conducted additional research. These studies highlighted the continuing importance of relationships between children and their caregivers.

Children who experience trauma, whether from disaster or another event, such as violence at home can experience a variety of emotional, physical, and mental issues (Berson & Baggerly, 2009). Teachers and childcare providers can provide a first line of support and are often the first to help children handle these issues postdisaster. They can enable the children in their care to develop ways to cope with the disaster or traumatic event (Berson & Baggerly, 2009). According to Berson and Baggerly (2009), because children often follow the lead of those around them, providers must find a way to manage their own grief or emotions before attempting to take on the challenge of helping children process their own emotions. Follow on research on intervention programs, like that provided by Cornelli-Sanderson, Gross, Sanon, and Janairo (2016) validates this continued acknowledgement of the importance of helping the "helpers" in order to better facilitate the recovery and resiliency building of children.

Information on individual agency best practices are ubiquitous, but what is often lacking is consensus on best practices across agencies or organizations. Ager, Stark, Akessen, and Boothby (2010) conducted a three stage Delphi design study to help identify best practices for the care and protection of children in areas impacted by crisis (to include disasters). Participants were sought after development of a specific four

category criteria that sought to find highly qualified leaders in the field of child protection and advocacy (Ager et al., 2010). Participants submitted their best practices, which were consolidated in the first phase of the study. In the second phase, participants rated the best practices. The final phase was the presentation of the study group's compiled rating where members were allowed to modify their results based on the aggregate results.

The results of this study continue to build the argument for the importance of childcare restoration postdisaster. First, the study found that 96% of the participants agreed or strongly agreed that the primary goal in better protecting children and caring for them postdisaster would be to both limit their exposure, and provide to activities that would help enable or restore a sense of normality postdisaster (Ager et al., 2010). Second, 97% of the participants agreed or strongly agreed that restoral of school was a critical protective measure for children (Ager et al., 2010). Third, 90% of participants agreed or strongly agreed that providing safe places for children to learn and play was important to their protection and recovery (Ager et al., 2010).

It is interesting to note so many researchers looking into children and disaster have utilized the bio-ecological framework. Buchanan, Casbergue, and Baumgarter's (2010) study was designed to investigate how teachers responded to hurricanes in their classroom environments and how effective teaching about hurricanes was. This study included observations of classrooms not impacted by Hurricane Katrina, but those in a hurricane active area (Buchanan et al., 2010). Surveys were created for preschool, kindergarten, first, second, and third grade teachers. The study was sent to over 2,000 teachers, with 592 responding. Their study is interesting in that it noted preschool and

kindergarten programs, typically with more flexible curriculum than older classes, and actually engaged in less planned activities related to hurricanes after Katrina (Buchanan et al., 2010). Also evaluated was comfort with how to help children postdisaster. Forty five percent of the survey participants in Louisiana reported that they felt they needed more training and resources on how to help children postdisaster (Buchanan et al., 2010). The findings indicated the need for teachers, and arguably childcare providers, to have age appropriate material and resources, and the discretion to provide training, to help children talk about disaster as well as have additional resources on how to identify issues or problems beyond the scope of schools or childcare providers.

There have been a variety of studies that highlight the impact of disaster experiences and stress of caregivers on children (Belfer, 2006; Gil-Rivas et al., 2010; Scaramella et al., 2008; Snider, Hoffman, Littrell, Whitney-Fry, & Thornburgh, 2010). Previous research has shown that the return of stability and routine can help children recover (Kilmer, Gil-Rivas, & MacDonald, 2010). Historically, a number of studies have shown that schools are uniquely positioned to help children recover through their resource provision and environment characteristics and capabilities (Chemtob, Nakashima, & Carlson, 2002; Cole et al., 2005; Wyman, Sandler, Wolchik, & Nelson, 2000). Kilmer et al. (2010) chronicled the experience of Mayfair Elementary, stood up to handle displaced Hurricane Katrina students, as an example of how a school can positively impact recovery. Kilmer et al. (2010) highlighted the importance of school not only as a normalizing element, but also as a resource to help locate children who need additional help recovering and also as a venue to delivery that recovery support. Studies

conducted also highlight the detrimental effect of moving children to another school postdisaster (Kilmer et al., 2010).

There were a few highlighted lessons learned in this case study. A noted best practice was the need for teachers to be able to take care of themselves in order to enable them to take care of the students (Kilmer et al., 2010). Also noted was once again the important role a teacher plays in the life of a disaster-traumatized child. A childcare provider plays the same important role for younger children as the teacher does for older ones. That person / teacher is a key part of a child's daily routine and the absence of that familiar face after a disaster does nothing to aid the healing process.

In testimony before the Senate Committee on Homeland Security and Governmental Affairs Ad Hoc Subcommittee on Disaster Recovery of the United States, Dr. Reeves talked about the role schools play in enabling disaster recovery and the need to invest in their preparedness (Skalski & Reeves, 2010). She likened the need for schools in a crisis response to not a choice, but a reality (Skalski & Reeves, 2010). Perhaps one of her most poignant statements was that all the school staff became not just first responders during a disaster, but crisis caregivers postdisaster (Skalski & Reeves, 2010). Concurrent to her declaration she highlighted the need for significant investment in the training of school staff to enable recovery support for children affected by disaster (Skalski & Reeves, 2010).

While this testimony applied specifically to schools, usually publicly funded, it is also highly relevant to childcare. As school age children spend a majority of their time daily in school, so to do younger children in childcare. Children five and under spend an

average of 33-35 hours a week in childcare arrangements of some type (Laughlin, 2013). This testimony builds upon the documented appeals for better training and recovery capabilities for services that support children. As schools can also serve as venues for mental health resource consolidation postdisaster, childcare could also serve to be a resource in which many children with potential needs can be reached concurrently in an environment they trust and are comfortable in.

Snider et al. (2010) responded to Hurricane Katrina as psychosocial support staff tasked with the implementation of programs to aid the postdisaster recovery of children. Their study first looked at what had been put in place for children and assessed whether these programs best addressed the needs of children, or the needs of the organizations providing the services (Snider et al., 2010). Their analysis was framed through the bio-ecological framework. The bio-ecological model looks at what children and their families are exposed to, and assesses how those factors affect their development, learning, and in this case, recovery (Snider et al., 2010). One of the things about experiencing a disaster that Snider et al. (2010) claims hits children the hardest is the feeling of powerlessness and the disruption of normal in their lives. Some of the lessons learned included the need to recreate a safe environment for children postdisaster (Snider et al., 2010). Schools can help reestablish that lost sense of normalcy (Snider et al., 2010). Childcare and other entities that make up part of young children's daily life also help fill this role.

Restoration of a safe environment and a reestablishment of a sense of calm have been identified as critical elements in enabling recovery in children (Gibbs et al., 2015). Gibbs et al. (2015) review of several smaller studies on the impacts of relocation

postdisaster indicate that it might not be the disaster which poses the greatest threat to a child's recovery, but instead how their postdisaster "life circumstances" are impacted. Changes to a child's routine, school or home location have indicated an increased potential for postdisaster recovery issues (J. Osofsky et al., 2015; Terranova et al., 2015). Gibbs et al. (2015) conducted a qualitative study of 35 participants, ages 4-66 years old, affected by the 2009 fire in the State of Victoria, Australia. One of prevalent themes that emerged was a sense of lost safety. No longer did the affected children believe mom and dad would or could take care of everything because they knew of examples where a friend had been hurt or killed despite the probable assurances that child had gotten from his/her own parents (Gibbs et al., 2015). Their research also indicted increase recovery of children with quicker routine restoral as well as when the children were given a greater role in decision making within the family (Gibbs et al., 2015). While this study was very small in scope, it highlights the natural resiliency of children if the restoration of a normal and safe environment can be established.

Cornelli-Sanderson et al. (2016) evaluated the experience of a United States-led NGO, Life is Good, in its application of the Playmaker trauma intervention model in Haiti after the devastating 2010 earthquake. The Playmaker model is comprised of four elements or building blocks: active engagement, social connection, internal control, and joyfulness (Cornelli-Sanderson et al., 2016). These four elements overlap with many other trauma intervention principles currently advocated (Cornelli-Sanderson et al., 2016; Hobfoll et al., 2007). Active engagement centers on the realization that children need full body activity and a safe place to participate in order to keep their minds in the "present"

(Cornelli-Sanderson et al., 2016). Restoration of schools and childcare help provide that centering location and enable active engagement (Cornelli-Sanderson et al., 2016; Masten & Narayan, 2012). Social connection is the degree of interest a child has in connecting with or interacting with others (Cornelli-Sanderson et al., 2016). After a trauma, a child's caregiver can help buffer the disaster impacts, but if that caregiver is missing or also traumatized, caregivers outside of the family, such as school teachers, childcare providers, etc., can help fill that important role and help increase a child's resilience to the impacts of disaster (Cornelli-Sanderson et al., 2016). Internal control is about a child regaining some control over their emotions, actions, or thoughts (Cornelli-Sanderson et al., 2016). The fourth element, joyfulness, is about finding happiness, and not dwelling in the negativity of what has occurred (Cornelli-Sanderson et al., 2016). The Playmaker model encourages activities that help a child find fun and smiles, such as dancing, singing or other things that could evoke laughter and help promote healing (Cornelli-Sanderson et al., 2016). Children who can have these four elements addressed potentially will be less likely to suffer the long-term effects of posttraumatic stress. Childcare can play a role in this posttraumatic stress mitigation.

The qualitative research presented by Mutch (2016) was quite different than a majority of other research presented on children and their resiliency or recovery in the face of disaster. This difference stems from the focus of the study being more on the school as enabler of disaster survival and as a source of recovery support for children and the community rather than on the children themselves. Mutch (2016) studied the postdisaster activities of five elementary schools following the 2010 Christchurch, New

Zealand earthquake. Previous research indicates that children can be aided in their disaster recovery through the provision of resources to process the event, the restoration of a normal routine, and through the creation of recreation activities that prevent excessive rumination on the disaster or disaster-inspired events (Mutch, 2015).

It seems a popular trend that researchers of community response and recovery are looking at this problem from an ecological perspective. Gil-Rivas and Kilmer (2016) also highlighted not just the importance of social capital in individual recovery, but reliance on social infrastructure that support individual needs such as schools, faith-based organizations and medical facilities. Like many of her colleagues, Mutch (2016) also advocated for an ecologically inspired approach to recovery (Mutch, 2016; Pfefferbaum et al., 2010). The central role of a school in providing the community a service enables it to be identified as a potential postdisaster rally point for both children and their parents in recovery and resiliency building activities (Gil-Rivas & Kilmer, 2016; Kilmer et al., 2010). In normal times, schools are often expected to identify potential issues children face, so postdisaster expectations would not necessarily change. A historical task of identification of children with emotional issues, or perhaps facing additional problems at home (i.e., abuse, neglect, etc.,) has enabled the school, as a community asset, to be uniquely positioned to help identify additional disaster-induced trauma effects (Gil-Rivas & Kilmer, 2016).

Mutch (2016) conducted a participatory study of school experiences with the Christchurch earthquake, ultimately growing to include input from five elementary schools. The qualitative sample population mostly consisted of school principals and

teachers, but students and parents were also included (Mutch, 2016). The study included observations from participants on what happened and why they felt they responded the way they did. This study was instructive as it provided anecdotal insight into the role of teachers and schools in providing a synergistic recovery resource to a community hit by disaster. In this way, childcare can play a similar role. While childcare does not typically have the ability to become the shelter in a postdisaster community, it can become another set of eyes and ears watching the children and helping identify where help might be needed.

T. Powell and Thompson (2016) conducted a quasi-experimental study of the resiliency building effects of the Journey of Hope (JoH) school intervention program on children who had experienced a natural disaster. T. Powell and Thompson (2016) wanted to determine if utilization of the JoH intervention program could result in improved protective factors and coping skills as well as a decrease in identified risk factors indicative of behavior problems. The JoH intervention technique was an educative rather than traditionally therapeutic treatment and was designed to build coping capabilities, thus theoretically, strengthening resiliency and protection factors (T. Powell & Thompson, 2016). The study included 102 participants, 48 in the experimental group and 52 in a control group (actual treatment wait list group). The intervention program was comprised of eight sessions of one hour each, specifically tailored for three age groups: kindergarten – 2nd grade, 3rd – 5th grade, and 6th – 8th grade (T. Powell & Thompson, 2016). This study included children in the 3rd – 5th grade range. The results indicated that

the treatment was significant for increased coping and prosocial behaviors, but it was not able to establish significance for risk factor mediation (T. Powell & Thompson, 2016).

Despite the value this study provides, being one of only a few evidence-based studies of children postdisaster not yet classified as suffering from post-traumatic stress, it has limitations. While the study included both an experimental and control group, the school required that all students participating be afforded the treatment, thereby modifying the typical bias controls. Other sampling limitations included student participant recruitment by teachers and the inability to assign participants through a random selection process (T. Powell & Thompson, 2016). T. Powell and Thompson (2016) also cited sample size as a limiting factor. While this study was applied to a group older than the intended study group of this project, it provided interesting insight into the value of educative resiliency building options available to all children postdisaster.

Consistent and identifiable measurement of the recovery of children has been problematic from a research perspective due to the ethicality concerns of reintroducing trauma to a vulnerable population (Masten & Narayan, 2012). Previous research indicated that the timing of the disaster in relation to the developmental stage of the child impacts how a child reacts to, and recovers from, a disaster (Masten & Narayan, 2012). Children often first need comfort after a traumatic event. The shape and scope of that comfort varies not just only upon the degree of trauma, but the age of the victim. Younger children will need more physical support, maybe through hugs or reassurances brought through maintaining proximity (Peek, 2010). Social agents, as described by Peek et al. (2008) can help fill this role, especially when parents are consumed with other

disaster recovery functions. Additionally, the development of relationships between private and public sectors to help enable social agent support for children can greatly enhance the recovery options for children and the community (Berg, Musigdilok, Haro, & Myers, 2014).

Research on the resiliency and recovery of children has increasingly included the successfulness (or lack thereof) of these recovery enablers. Evidence supports the importance of safety and routine restoral on recovery trajectories. Additionally, the role of schools or childcare in facilitating recovery has also started to get more attention. What has not yet been sufficiently covered is the role of childcare in the community, specifically its role in keeping children safe during disaster and its ability to enable disaster response and recovery. The existing literature on this topic will be addressed in the next section.

Childcare

Childcare is a vital part of American society. Nearly 61% of children five and under spend an average of almost 36 hours a week in childcare arrangements of some type (Childcare Aware of America, 2016; Laughlin, 2013). School age children average 13 hours a week in before- and aftercare programs (Laughlin, 2013). Childcare enables parents to work and also concurrently provides additional value through the training of young children on socially acceptable norms and behaviors (Committee for Economic Development, 2015; Warner, 2007).

In addition to its educative value childcare also provides significant economic value. As an industry it employs over 2.2 million workers, and is responsible for almost

$50 billion dollars in revenue annually (Childcare Aware of America, 2016; SBDCNET, 2017). Research has also indicated that investment in childcare brings future economic gain and ought to be considered as an economic initiative measure (Bartik, 2006; Rolnick & Grunewald, 2003). Childcare's multi-faceted impact on the community makes analysis of its value and interactions within the community more complex due to the variety of relationships and interdependencies it holds or facilities in a given area (Warner, 2006). Warner (2007) makes a compelling case for consideration of childcare as critical infrastructure for local economic development. There is documentation that the business sector acknowledges the value of providing childcare to their employees and the importance of dependable childcare on employee productivity and morale (Chambers, 1992; Gardyasz, 2005). At the same time the childcare industry presents various internal economic contradictions. The industry employees are often not well compensated and almost 15% of industry workers live below the poverty line (Childcare Aware of America, 2016). Research has also indicated the overall cost of infant care to parents in 38 states exceeds the reported median income for 10% of two parent families (Childcare Aware of America, 2016).

Childcare and Disaster

The literature on childcare and disaster is significantly less populous than that of children and disaster. The primary sources are concentrated around childcare preparedness and response and the role of childcare in community recovery. There is a limited amount of information available from studies on childcare preparedness, and a few policies or laws that regulate childcare preparedness. Some research has been done

on the need or desirability of childcare availability for first responders and hospital workers during or immediately after the disaster. Additionally, there is a limited number of advocacy papers or case studies highlighting the importance of childcare continuity or the importance of childcare recovery in enabling community recovery.

Childcare disaster preparedness. There is often discussion about the level of childcare preparedness for disaster, but little has been empirically presented. Childcare providers are responsible for the safety of the children under their care. Despite this, emergency management planners stop short of that further step of considering them first responders and training childcare providers for that important role (Gaines & Leary, 2004). Childcare has also been referred to as the "generator" that runs a local economy, but it is often left without fuel, thereby limited in its degree of preparedness to get through, and recover from, the disaster (Bullock et al., 2011). This section on childcare disaster preparedness will look at the limited research conducted on childcare providers or in assessing childcare provider readiness or their postdisaster resources. Disaster preparedness assessments of childcare that have been made by government agencies will also be addressed. The national statutes or disaster preparedness requirements for childcare will also be addressed. Individual states may require additional provisions, but the federal standards listed herein are the minimum requirement childcare providers must meet.

The study conducted by Wilson and Kershaw (2008) was only the second ever conducted on the state of childcare preparedness (Peek, 2008). Previous research on how childcare providers prepare for, or respond to, disaster was only evidenced by a small

study of the readiness of 25 childcare programs conducted by researchers Junn and Guerin in 1996 (Gaines & Leary, 2004). Wilson and Kershaw (2008) conducted a survey of 67 Florida childcare providers. The response returned were predominately from two counties, although 14 counties sent in responses. Because of this, the researchers cite valid concerns with generalizability. The population was comprised of mostly childcare directors (80%, n=53) and over 83% of respondents indicated that they had experienced a hurricane in their area in the previous five years. The results indicated that more than 40% of the respondents wanted better regulations or guidelines on how to be prepared and over 50% felt they did not have the necessary training to recognize and help children who had been traumatized by a disaster (Wilson & Kershaw, 2008). Analysis of 9/11 and Hurricane Katrina has also demonstrated the importance of teachers, childcare providers, and other family support personnel to receive training on understanding the signs of trauma and referral options and program familiarization, so this study helps affirm this recommendation (J. D. Osofsky, Osofsky, Kronenberg, & Hansel, 2010).

While the existence of this study, one of childcare providers, is valuable due to the dearth of others like it, methodologically it has several limitations. The validity or reliability of the questionnaire used was not addressed. Some of the questions, such as assessment of moderate vice severe damage are asked of participants was without definition of these categories and could lead to erroneous collection (Wilson & Kershaw, 2008). The data analysis techniques were not addressed, except for a brief mention of some of the demographic data being looked at with frequency analytic techniques. Conclusions about how prepared or not, or how much training was needed cannot be

ascertained from this study. This study does highlight the need to further research the perceptions, training levels, and preparedness of childcare providers. Preparation is important, but perception, especially that of the persons conducting the service, will influence performance and should be better understood. This study helped highlight the need for additional data collection on childcare and disaster.

The only other study on childcare providers and disaster found was conducted by Kinsel and Thomasgard (2008). Kinsel and Thomasgard (2008) conducted a qualitative analysis of trained emergency childcare workers who responded to 9/11 emergency childcare needs. Kinsel and Thomasgard (2008) conducted a qualitative study of 66 of 93 Disaster Child Care (DCC) and Childcare Aviation Incident Response (CAIR) volunteers that provided emergency childcare services in New York in the immediate aftermath of 9/11. The primary purpose of the study was to identify and evaluate behaviors observed by these childcare providers as they interacted with children and parents, and what emotions and behaviors they either experienced or noted among their colleagues. This study was conducted one year after 9/11, so memory recall might be a study limitation.

This study was not so much about preparedness of average childcare providers, but instead the experiences and observations of emergency childcare providers serving a community postdisaster. The childcare providers noted several behaviors children affected by trauma are likely to express (e.g., distress and separation anxiety), and these have been covered previously (Kinsel & Thomasgard, 2008). The behaviors of parents, the hypervigilance, the need to feel their child is safe, the lingering to check on them, and a sense of relief or appreciation that there was a safe place their child could be while they

tried to put their lives back together presented more evidence on the criticality of childcare postdisaster (Kinsel & Thomasgard, 2008). Childcare providers need to be prepared to handle the needs of parents and children postdisaster.

The National Commission on Children and Disasters was established by the President and Congress to identify gaps and issues facing children during disaster preparedness, response, and recovery phases as well as make recommendations to address those identified concerns (National Commission on Children and Disasters, 2010). The commission identified three areas of concern. The first are of concern was that the disaster preparedness capabilities of childcare were lacking (National Commission on Children and Disasters, 2010). Second, the commission identified the need to provide emergency childcare services immediately following a disaster event to help enable recovery efforts (National Commission on Children and Disasters, 2010). Third, it identified the requirement for training childcare providers in basic mental health issues to help identify children needing additional support or help postdisaster (National Commission on Children and Disasters, 2010). The commission recommended that the first issue of capability building be addressed through state development of disaster training and exercise requirements as well as through increased collaboration with childcare in state disaster planning forums. The second recommendation from the commission was more focused on disaster relief funding. This topic will be addressed in greater depth later in this chapter, but the recommendations included a call to recognize childcare as critical infrastructure and to modify disaster assistance exceptions accordingly (National Commission on Children and Disasters, 2010). The third

recommendation about providing mental health training and support for childcare providers was surprisingly congruent with the limited work done by Wilson and Kershaw (2008) and Kinsel and Thomasgard (2008) that addressed that same need to better prepare childcare providers for handling the aftermath of disaster.

The interdependencies between childcare disaster preparedness regulation and funding can best be understand through a short historical evolutionary discussion of federal childcare health and safety regulations. Prior to 1996 federal funding for childcare has been from four federal government programs designed to support the childcare needs for low income families. These were typically associated with the welfare system and were called the Aid to Families with Dependent Children (AFDC) programs (Lynch, 2014). The fourth program was actually was the Child Care Development and Block Grant (CCDBG) Act and was established in 1990 (Lynch, 2014). The welfare reform law of 1996 repealed the childcare programs of AFDC and reorganized their structure (Lynch, 2014). Additionally, it changed the CCDBG program and created for it a discretionary funding stream. In 2013, the CCDBG Act was amended and signed into law by President Obama. This modified act increased a number of measures and requirements for childcare, setting new safety and health standards. The Child Care and Development Fund (CCDF) was authorized under the CCDBG and is administered through the U.S. Health and Human Services Administration for Children and Families (ACF) (Child Care and Development Block Grant (CCDBG) Act of 2014; Child Care and Development Fund Program of 2016). The CCDF was designed to help low income families afford

quality childcare for their children 13 and under (Child Care and Development Fund Program of 2016).

So, what does that all mean? It means that in order for families to receive CCDF support, their desired childcare must comply with CCDBG requirements, including disaster preparedness requirements. Among these requirements are the following three disaster preparedness standards. First, the childcare is required to have a written plan for manmade and natural disaster (Child Care and Development Block Grant Act of 2014). The plan must involve contingencies for evacuation or relocation, lockdown, sheltering in place, and family reunification (Child Care and Development Block Grant Act of 2014). The plan must also address continuity of operation and training and procedures guidelines for staff and teachers (Child Care and Development Block Grant Act of 2014). Second, the state must have a plan for supporting the needs of childcare during a disaster (Child Care and Development Block Grant Act of 2014). ACF and Federal Emergency Management Agency (FEMA) officials have further asked that states consider the needs of childcare and include childcare considerations in their state emergency planning documents (Wizemann et al., 2014). The CCDBG Act of 2014 also tasks states with helping childcare programs to strengthen their business practices to improve their overall care and makes implicit reference to business recovery or continuity planning (Child Care and Development Block Grant Act of 2014). The adoption of the CCDBG has addressed some of the disaster preparedness issues brought up by the National Commission for Children and Disasters (2010) although it leaves implementation and evaluation of "success" to individual states to determine individual childcare organization compliance.

Childcare during disaster. Childcare, like schools, typically close during known or pending disasters (e.g., hurricanes, storms, pandemics). There are, of course, many other disasters that are not predicted, such as earthquakes or terrorist events that may necessitate the standing up of facilities to support parents who are first responders or business people who need to fulfill their job obligations. This section will discuss the frequently unreported value of corporations working to enable childcare operations during a disaster event as well as the emerging research on the value, complications, or gaps in providing childcare to first responders and hospital workers during or immediately following a disaster event.

Little research has been conducted on postdisaster childcare standups by corporations that need to function during a disaster, but at least one case study was found. In this example, the Eastern Financial Florida Credit Union (EFFCU) learned from the 2004 hurricane season the importance of offering childcare to their employees (Messmore, 2005). They partnered with a local childcare program to offer activities and house a “Hurricane Day Camp” onsite so that parents could work knowing their children were safe and under adequate supervision (Messmore, 2005).

As mentioned above, a growing body of research is emerging that helps provide more insight into childcare needed or provided during disaster to enable first responders and/or hospital workers in conducting their duties. Melnikov, Itzhaki, and Kagan (2014) conducted a study that evaluated Israeli nurse willingness to respond to national disasters and potential barriers to response. Charney, Rebmann, and Flood (2014, 2015a, 2015b) conducted a series of studies on the willingness of hospital workers to respond to national

disaster and on the barriers that would preclude participation within the United States under various scenarios.

Melnikov et al. (2014) conducted a survey of 243 registered nurses in Israel. The sample was convenience based and taken from the advanced nursing course, so willingness to respond to a disaster could be biased by this sample. Despite that, the results regarding a lack of childcare as a possible barrier to disaster response were relevant to this study. Of the participants interviewed, only half had actually reported to a previous disaster when called in to work (Melnikov et al., 2014). The study looked a variety of reasons why this had occurred, from self-efficacy, perceived knowledge and other personal issues as well as potential barriers (e.g., the need to care for children, pets, parents, health issues or transportation difficulties) (Melnikov et al., 2014). The largest barrier to reporting to work during emergency conditions was childcare (71.1%), followed by care of parents (36.8%), then health problems, transportation issues and finally pet care.

Melnikov et al. (2014) reference the study conducted by Qureshi et al. (2005) in which an assessment of what barriers healthcare workers in New York assessed as preventing them to report for duty during a crisis. Qureshi et al.'s (2005) study had a sample size of 6,428, and while much larger than Melnikov et al.'s (2014), it too averaged almost half of its participants self-reporting as having childcare obligations as part of their normal life routine. In the Qureshi et al. (2005) study, the most significant barrier for failure to report for duty was transportation (33.4%) with childcare following at (29.1%). Melnikov et al. (2014) speculate that the higher delta of transportation over

childcare as a barrier could be due to cultural differences in childcare arrangement and placement further from work places. It could also be a matter of public transportation reliance. Either way, it does help validate the need to consider childcare requirements in planning for disaster response activities. These studies help provide evidence that lack of available childcare will impact hospital response and staffing rates.

Charney et al. (2014) conducted a study on willingness of hospital staff to work during specific disasters and also looked at childcare as a barrier to that participation. The sample population chosen for Charney et al. (2014) study included 1,234 healthcare workers who had been employed at one of two hospitals in Joplin, Missouri during the 2011 tornado. This study produced different results than either Qureshi et al. (2005) or Melnikov et al. (2014) studies in that the results did not indicate a significant difference in childcare needs impacting the ability of healthcare workers to report for work. Like the other studies, almost half of the study population (48%) indicated that they had children and did require childcare of some sort (including children with before or after school care needs). This study was interesting in that it highlighted a perceived willingness to report for future disasters that varied based on the age of the child(ren) at home, with a larger perceived impact for workers with children three or under compared to older children (Charney et al., 2014). This study also asked questions about whether or not a hospital provided childcare service would have been utilized, and if so, would it have decreased worry or fears about the safety of children. The results indicated that 51% of the participants would have used it immediately after the tornado to help ease childcare

issues, with over 40% indicating that it would have helped decrease worry for the wellbeing and safety of their child(ren) (Charney et al., 2014).

This study by Charney et al (2014) was interesting in that it provided different aspects about the need for childcare. Joplin, Missouri is very differently culturally than the locations of previous studies (i.e., Israel and New York) and this dynamic could have influenced the results. The researchers admit they did not have the study validated prior to utilization and that other limitations need to be considered. The study was conducted two years post event, so recall bias could have influenced the results. Also, the low response rate (approximately 23%) could also have introduced selection bias into the sample. This study appears to contradict previous studies about the impact of childcare needs on healthcare worker reporting during crisis, but it is important to include for comparative value.

In a follow on study, Charney et al. (2015b) evaluated the responses of 1,822 hospital employees in Missouri in regards to their willingness to work in both earthquake and pandemic situations. Both scenarios were presented to participants with both scenarios including the closure of schools and daycares. Ten factors were included as potential barriers to reporting during these crises, with childcare being one of the assessed factors (Charney et al., 2015b). Not unlike previous studies, almost half of the population indicated having children to care for, in this case 46.3% of those surveyed (Charney et al., 2015b). The participants indicated the following potential barriers to working in earthquake and pandemic situations (listed in order of greatest significance) concern for family members, fear of harm to self, concern about being asked/required to work a role

not trained to, or hired for (Charney et al., 2015b). Childcare concern was number four of the ten barriers and was reported by 30-34.6% of the sample population (depending on which scenario was being evaluated) (Charney et al., 2015b).

Charney et al. (2015b) admit to study limitations. Like their previous work, this was a survey evaluated using quantitative methods. The response rate was low, 15% so generalizability could be suspect. Survey announcement methods varied by hospital so higher participation may have been constrained by more active participation encouragement of hospital staff. The study was only available online in English, so this too could have limited response rates (Charney et al., 2015b). The biggest concern with this study was the ambiguity of the first "barrier" concern for family members. This was a logical first concern for all respondents, and it was not clear how this was presented. These barriers were presented as factors influencing willingness to work rather than ability. Had the question been phrased more as impacting ability, childcare or care of others may have ranked higher.

Charney et al. (2015a) conducted another survey, this time confined to an academic, urban, pediatric hospital. The study included 685 participants, and boasts a response rate of 40%. Like the previous study conducted, an earthquake and a pandemic scenario were presented. Like previous studies almost half of the participants (44.8%) indicated responsibility for at least one child at home. The study results indicated that emergency childcare needs would need to be considered and that in a pandemic scenario, childcare would have a greater impact on healthcare worker report rates (Charney et al., 2015a). This study also revealed that 1/3 to 1/2 of participants expected to use a hospital

provided childcare program should a disaster occur. This study again provides additional validation that the needs of childcare during and immediately following childcare must be considered.

Childcare and community recovery. Loss of childcare impacts families, and has critical implications for community recovery. After Hurricane Katrina only 52 of 266 childcare programs reopened their doors a year later (Jacobson, 2006). Even more significant, of that 210 childcare programs that did not open, only half of that was estimated to recover (Jacobson, 2006). In addition to the obvious long-term impacts of childcare program closures, short-term closures of schools or childcare is also costly. Zheteyeva et al. (2017) conducted a survey of families with school children affected by Hurricane Isaac in order to ascertain how unscheduled school closures, results of natural disasters like hurricanes or pandemics, could impact families. Zheteyeva et al. (2017) reviewed 2,229 returned surveys. Twenty-nine percent of the respondents indicated that school closure would create difficulties in finding replacement care for children, and almost 18% indicated that this difficulty would be exacerbated by the need to employ more expensive care alternatives (Zheteyeva et al., 2017). While this study was intended to ascertain the impact of school closures on families and resulting difficulties, it can logically be inferred the closure of childcares due to pandemics or other disasters would create similar, if not greater, problems. Ultimately, the inability to find childcare impacts the economic recovery of a local area since it does delay, or even permanently prevent parents from returning to work.

In a postdisaster environment, the recovery of childcare is important. If parents do not have access to safe and reliable childcare, they cannot return to work (Fry, 2016; Singletary, 2007). Typical recovery activities are primarily concerned with physical infrastructure rebuilding, specifically public infrastructures (Save the Children, 2007). Research indicated that disaster recovery, especially in an urban area, was stimulated or influenced by the recovery of social relationships or networks and that these social networks were critical to recovery, both for children and for the community (Save the Children, 2007; Vale & Campanella, 2005). Childcare is a key part of the social network within an urban area (Berke & Campanella, 2006; Vale & Campanella, 2005). Disaster recovery has also been cited as most effective when the entire community was involved, preferably beginning with disaster planning efforts (Berke & Campanella, 2006). Despite this acknowledgement of the importance of parents returning to work, little to no research exists that provides definitive correlation between lack of childcare and business/community recovery postdisaster. Conducting this study on how childcare recovers was the first step in determining a baseline of the childcare industry compared to other small businesses that can be built off of to further close this gap. To better understand childcare recovery, the next focus of this chapter is on a brief review and analysis of resiliency and recovery definitions, funding, and policy standards.

Resiliency and Recovery

Resiliency and recovery are buzzwords so frequently tossed around they leave the perception of simplicity of understanding and application in their wake. The reality is much more complex. Resiliency and recovery have multiple definitions and differences

abound as to the best measures to enact to obtain these goals. Understanding how these concepts are translated and then applied to childcare recovery is the first step in better assessing the significance of childcare in building resiliency in children, and in contributing to community recovery. At the same time, it is important to understand what recovery funding options are available to childcare programs postdisaster and how utilization or absence of utilization of these funding sources impacts recovery.

Definitions. Resilience has many definitions. At the individual level, it has been defined as the ability to successfully overcome threats, traumatic events, or other adversities (Pfefferbaum et al., 2010). On a larger scale it has been describes as the ability of individuals and groups to survive, get used to, or recover from a significant disruption to their sense or normal or the existence of loss (Peek, 2008). The National Recovery Framework defines resilience as the ability to survive and recover from deliberately planned attacks or naturally occurring disasters (Federal Emergency Management Agency, 2016b). On a more strategic scale, Vale and Campanella (2005) describe disaster as a test of the government's resilience. In this study, resilience was defined as the capacity to deal with, and recover from, an emergency or disaster events (Federal Emergency Management Agency, 2016b).

Disaster recovery is complex and is often described not just as a phase of the emergency management cycle, but also a process (Phillips, 2016). This study defined recovery as the restoral of community resources defined as critical to economic and social stability and sustainability postdisaster and also includes measures to strengthen identified weaknesses (Federal Emergency Management Agency, 2016b). The recovery

obstacles those impacted by Superstorm Sandy faced were significant. Hundreds of thousands of businesses were impacted (Phillips, 2016). The National Recovery Framework defines recovery as the tools and capacities needed to help affected communities recover in an efficient manner (Federal Emergency Management Agency, 2016b). Economic recovery is further defined as having been reached once a tax base within the community has been stabilized and a population can be sustained through job and service provision (Federal Emergency Management Agency, 2011).

So how should recovery be obtained? Most literature, including government recovery and response frameworks, advocates for a community approach (Federal Emergency Management Agency, 2013, 2016b). Vital to the success of a community approach is the need to address social networks or social capital. Social networks include community resources such as childcare organizations, social services, health services, churches, schools and other infrastructure that supports children within the community (Berke & Campanella, 2006; Gil-Rivas & Kilmer, 2016; Vale & Campanella, 2005). Social capital is built and maintained through this network of relationships that connect the community members to needed services (Chamlee-Wright, 2007; Chamlee-Wright & Rothschild, 2007; Gil-Rivas & Kilmer, 2016). Chamlee-Wright and Storr (2011) conducted a qualitative study of over 301 interviews in New Orleans, and Mississippi post-Hurricane Katrina. The study utilized both random and purposive sampling and sought to understand how community members saw recovery prospects through asking questions on their opinion about the way ahead, what help was needed from where, what was the best way to move forward (Chamlee-Wright & Storr, 2011). These narratives

indicated that social capital was a significant factor in recovery success (Chamlee-Wright & Storr, 2011).

Planning for the needs of children is a core element of planning for community recovery. Both the National Response Framework and the National Disaster Recovery Frameworks express the importance of identifying issues impacting children and working to address these potential problems in planning efforts (Federal Emergency Management Agency, 2013, 2016b). Additionally, the Child Care and Development Block Grant Act specifically requires states to consider the needs of childcare in development of emergency response and recovery plans (Child Care and Development Block Grant Act of 2014). The National Response Framework discusses the requirement to address family reunification of children and reopen schools and childcare as part of the recovery process (Federal Emergency Management Agency, 2013). Given these tasks identified in national response and recovery guidelines, the need to consider recovery abilities of childcare becomes all the more critical.

Recovery funding. Individuals affected by disaster have various recovery funding options. For the purposes of this study, these options have been divided into predisaster sources, postdisaster sources, or a combination of both. Predisaster sources include funding options like insurance and savings. Personal or business savings would also be considered predisaster mitigation funding. Postdisaster sources include loans and grants. Loans can be from the SBA, from financial institutions, or from friends and family. Grants can be from the government, such as in the case of Individual & Household Program (IHP) or Public Assistance Program (PA) grants. Grants could also

be from the state, for example, the Social Services Block Grant (SSBG). Finally, private grants may be available from organizations not fulfilling federal or state disaster relief funding requirements.

This section will introduce the disaster relief funding options allowed per the Robert T. Stafford Disaster Relief and Emergency Assistance Act (The Stafford Act). Disaster recovery funding options for small businesses, such as the SBA loan program will also be introduced. New York and New Jersey applied the Social Service Block Grant in aiding childcare after Superstorm Sandy, so this program will also be discussed (Murrin, 2015; Wizemann et al., 2014). The recovery funding options of normal bank loans, loans from friends or family, personal savings, insurance payouts or the process of obtaining private grants from agencies other than the aforementioned ones will not be addressed in this section, but data will be collected and demographic requirements addressed in greater detail in chapter 3.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (2013) provides the statutory authorization for federal disaster response, specifically Federal Emergency Management Agency (FEMA) programs (McCarthy, 2011). It defines the scope of emergency support and the programs it can offer. For example, the Stafford Act (2013) states that federal government support for emergency or disaster declarations cannot exceed 75% of the overall rebuilding or replacement cost; the state or tribe must absorb the remaining cost. The Stafford Act (2013) defines critical services (services eligible for federal recovery funding support) as those traditionally associated with public utilities, e.g., water, power, sewage support, and also includes communications,

emergency health systems and education as meeting the critical services criteria. The education category annotated in the Stafford Act (2013) does not typically include childcare or pre-k programs, although certain nonprofit organizations providing education to the general public may be eligible for funding support. The two most common programs authorized by the Stafford Act include the PA and the IHP programs. Their possible utilization for childcare recovery will be discussed in greater detail in subsequent paragraphs.

The IHP is authorized by section 408 of the Stafford Act and allows for special assistance to be given to individuals and/or households to enable recovery under specific circumstances (Federal Emergency Management Agency, 2008). IHP can be used to cover the gap between insurance coverage and repair or replacement costs for home or housing damage (Federal Emergency Management Agency, 2008). IHP does not cover household goods, but there are other costs it may support such as funeral expenses, additional medical expenses, etc. (Federal Emergency Management Agency, 2008). As part of the Sandy Improvement Act, IHP was expanded and created a new category of childcare assistance to families to help cover new or increased childcare expenses as a result of the disaster event (Federal Emergency Management Agency, 2014). In the event of a disaster, a childcare provider who operates from their residence that was damaged by Superstorm Sandy could be eligible for IHP funding to repair their home (which also functions as their place of business). In theory, this could give residential childcare programs disaster recovery funding advantages over childcare organizations operating outside of their residence since those nonresidential childcare organizations would be

ineligible for IHP support. For example, a homeowner could apply for and get IHP. Because that homeowner also had a business within their home, in this case childcare, they could benefit from the recovery funding of repairs.

The PA program is authorized by section 406 of the Stafford Act and allows for disaster recovery assistance to government organizations and "some" nonprofit organizations (Federal Emergency Management Agency, 2016a). PA covers debris removal and can cover repair or replacement of approved facilities (Federal Emergency Management Agency, 2016a). Nonprofit childcare programs may be able to qualify for PA support, but they would be fall into the noncritical, essential governmental-type services category (Federal Emergency Management Agency, 2016a). Any for profit childcare organization would be ineligible for PA (Federal Emergency Management Agency, 2016a).

Childcare programs that operate as forprofit entities would have to utilize savings and insurance, or might have to apply for SBA loans to cover the difference between the repair cost and available recovery funding. Businesses may be eligible for physical disaster loans and/or economic injury disaster loans (Lindsay, 2010; Small Business Assocation, n.d.). These loans may be used to help repair or replace the business and property within, as well as potentially refinance mortgages (Small Business Assocation, n.d.). Business loans greater than $25,000 may be subject to credit checks (Lindsay, 2010; Small Business Assocation, n.d.). According to Wizemann et al. (2014) childcare programs have had difficulty in qualifying for SBA loans due to limited personal savings or collateral to secure the loan(s).

The Social Services Block Grant (SSBG) is administered by the Office of Community Services, an office of the U.S. Department of Health & Human Service Office of Administration for Children & Families (Office of Administration for Children and Families (OCS), 2017). It is designed to support vulnerable populations and helps create or improve needed social services (Lynch, 2016). States have apportionment discretion, but it is important to note that SSBG funds have often be subject to sequestration, so "budgeting" allocation is problematic (Lynch, 2016). The Disaster Relief Appropriates Act in 2013 allocated additional funding to the SSBG (Murrin, 2015). Of that additional funding New York received $462 million and New Jersey received $227 million (Murrin, 2015). New York and New Jersey provided financial assistance to enable childcare repair and reopening (both forprofit and nonprofit) (Murrin, 2015). SSBG funding can only be used when all other options, IHP, PA, SBA loans, insurance, etc., have been exhausted (Lynch, 2016; Office of Administration for Children and Families (OCS), 2017).

Childcare programs have several disaster recovery funding options. First, childcare programs can utilize savings and support from friends, families or the community. Insurance may cover some of the damage costs. Depending on the type of childcare, a childcare may qualify for help through the PA or IHP programs. As a business, it may apply for SBA loans to cover disaster costs. In New York and New Jersey, SSBG funding was used to support childcare; but states are not required to support childcare recovery, so the option of SSBG as a recovery funding source has been

inconsistent (Murrin, 2015). Now that the disaster recovery funding options have been explained, the discussion will now move into business recovery postdisaster.

Business Recovery and Continuity

According to the Federal Emergency Management Agency (2015), 40 to 60 percent of small businesses fail to recover postdisaster. When looking at the childcare industry, this statistic takes on special significance. Given that over 70% of the childcare industry is comprised of forprofit businesses and thus ineligible for many disaster recovery programs, this places childcare programs in a highly precarious situation should disaster occur (SBDCNET, 2017). Additionally, a vast majority of childcare organizations meet the SBA standards for small business ("Business Credit and Assistance, 13 C.F.R.," 1996). Because of this, this section of the literature review will focus specifically on small business recovery. Some research has been done on small business recovery, but the results are not conclusive and many of the study results seem to contradict each other. Overall, small business recovery is an understudied and complex research area that would benefit from more analysis.

Webb et al. (2002) conducted a quantitative analysis of two disasters (the Loma Prieta earthquake and Hurricane Andrew) to see if long-term business recovery could be predicted, and if so, by what factors. The results of this study were interesting and unexpected. South Dade County (Hurricane Andrew sample group) participation included 1,078 firms and the Santa Cruz County (Loma Prieta sample group) was comprised of 933 firms (Webb et al., 2002). The study took a look at business recovery and tried to assess if some of the known variable correlations to individual household recovery

success were applicable to business recovery. Webb et al. (2002) developed a model that looked at owner characteristics, previous disaster experience, the direct and indirect disaster impact, any pre- or postdisaster loss or containment efforts engaged in, and the economic climate assessments of the owners. The study highlighted several unexpected outcomes. Firms assessed as more financially stable prior to the storm were less likely to recover than less well-off firms (Webb et al., 2002). Also, Webb et al.'s (2002) prediction that business longevity would predict recovery was disproven. The results indicated that business age was not a significant factor in predicting faster recovery times (Webb et al., 2002). Previous experience with disaster and mitigation or loss containment actions also proved insignificant for recovery (Webb et al., 2002). The results also indicated that businesses whose services or products were not confined to a small geographic area stood the better chance of recovery (Webb et al., 2002). The last interesting result was the prediction of postdisaster aid; Webb et al. (2002) predicted that use of this type of recovery aid would improve recovery times, yet it proved to have no significant effect on recovery outcomes.

Although this study is dated, it looked at a variety of different characteristics and criteria and attempted to determine which businesses recover from disaster. It did not, however, provide insight into any particular industry. The study did not detail out what types of small businesses were surveyed (i.e., restaurants v. hair salons v. childcare, etc.). The study could, however, serve as a comparison to some of the data in this dissertation study. Resource dependency and use of post- versus predisaster funding sources may help

validate, or invalidate Webb et al.'s (2002) work and provide additional value to the business continuity community.

Businesses are vulnerable after a disaster. They are often dependent on the vitality of a community and the households in that community for their stability (i.e., employees and consumers of their company's product or service) (Zhang et al., 2009). Childcare is no different. As mentioned previously, childcare is vulnerable due to its reliance on employees and customers from its local area (Webb et al., 2002). Zhang et al. (2009) highlights other vulnerabilities that businesses affected by disaster face, to include: capital, labor, supply, and customer vulnerabilities. Lack of capital and local labor or supply impacts are all typical after a disaster (Runyan, 2006; Webb et al., 2002; Zhang et al., 2009). Zhang et al. (2009) highlights an important issue that affects childcare significantly postdisaster, customer vulnerability. Childcare 'customers' do not vary daily. Most sign agreements to have their children in full or part time arrangements, so there is no significant short-term turnover of clientele. Closing of a childcare location, even temporarily, puts that childcare program at risk of losing that child. Closure for any significant amount of time will likely cause the parents of the affected child to seek alternative childcare so that parents can return to work. If enough time passes, the parents may not bring their children back to the original childcare because the child will have adapted to a new location and parents try to decrease disruptions to their child's routine as a matter of course.

The study and literature research conducted by Wasileski et al. (2011) contradicts many of the conclusions of Webb et al. (2002). Using the same data set used by Webb et

al. (2002), Wasileski et al. (2011) looked at lifeline disruption, physical damage percentages, and other business ownership factors to see if a predictive relocation or recovery model could be determined. Wasileski et al. (2011) cited additional studies where small business size, age of business and other actors have resulted in increased business vulnerability (Tierney, 2007). One of the interesting conclusions of this multi-variant analysis was that businesses who worked out of leased building were more likely to relocate postdisaster than those who owned their business location (Wasileski et al., 2011). Also interesting was that the loss of reliable electric and phone services seemed to predict higher closure rates (Wasileski et al., 2011). This study did not provide additional evidence that businesses owned by women were more likely to close than male owned businesses, but it did indicate that businesses with less employees were more likely to close than those with many employees (Wasileski et al., 2011). Wasileski et al.'s (2011) research indicated that businesses in the manufacturing and service sectors were more likely to close than other private sector businesses. Wasileski et al.'s (2011) analysis of many of the factors that precipitate closure are also present in the childcare.

Schrank, Marshall, Hall-Phillips, Wiatt, and Jones (2013) sought to test a methodology for gaining access to businesses that failed as a result of a natural disaster. Their efforts were in part to fill the gap in understanding how to locate and contact businesses no longer in operations, and also to validate (or not) the claim that 40% of businesses fail as a result of experiencing a natural disaster (Schrank et al., 2013). According to Schrank et al. (2013) businesses failure rates are often estimated and specific data on reasons why businesses fail (e.g., attributable causes) is often lacking.

Small businesses in general have a fifty-fifty chance of surviving their first five years of operation and business research indicates that 80% of new businesses do not survive their beyond the first three years of operation (Schrank et al., 2013). Schrank et al. (2013) utilized a combination of database purchases, reverse phone call look ups, property record searches, and field work to try and identify closed businesses and find information on how to access previous owners. Their study revealed that less than 19% of businesses in their sample closed (Schrank et al., 2013). Interestingly, that number included more than just disaster attributed closures. This number contradicts the previous estimate of 40% given by Herbert Mitchell on behalf of the SBA Office of Disaster Assistance in 2004, as well as the more recent Federal Emergency Management Agency (2015) assertion of a 40-60 percent failure rate (Schrank et al., 2013). The research conducted by Marshall et al. (2015) on this same sample group indicates that there is evidence indicates a greater probability of postdisaster closing if a minority, woman, or veteran owned the business. Concurrently, The information collected by The Hartford (2013) indicated that male-owned businesses self-reported as more greatly affected than female-owned businesses.

The contradictory and inconclusive studies make business recovery causal recovery success attribution problematic. It does serve to highlight the difficulty in predicting recovery success. It also highlights the need for more research on business recovery. Also apparent is a true lack of specific industry studies. Historically, much of the prior disaster recovery studies have focused either on individuals or communities and studies with small business as the unit of analysis have been limited (Marshall &

Schrank, 2013). This proposed study on the business recovery of childcare could provide insight into a specific service industry, which could in turn then provide comparative value for other industry or business sector recovery analysis.

Childcare Recovery

Childcare plays an important role in the recovery of children (Myers & Mendel, 2014). Previous studies have attested to its value, but what is really known about childcare recovery itself? What is known about the ability of childcare to handle the needs of children experiencing trauma? Wilson and Kershaw (2008) indicate that childcare programs are not comfortable with their understanding of how to help children traumatized by disaster, but according to Myers and Mendel (2014) after a disaster childcare programs will be placed in a position to have to handle this. This shortcoming has also been noted by the National Commission on Children and Disasters (2010). Very limited research has been done on childcare recovery from disaster. Most reporting of childcare and disaster related details has been allegorical descriptions of the number of affected childcare rather than recovery experiences of numbers of childcare that did eventually recover, or of what had helped them recover (Grace et al., 2006; J. D. Osofsky et al., 2007a).

Murrin (2015) conducted a small qualitative study to better understand the state of childcare preparedness and the level of state preparedness to meet the needs of childcare through the context of what had happened in New York and New Jersey during Superstorm Sandy. Eleven nonresidential childcare programs and nine residential childcare programs were selected for survey invitation with ten nonresidential childcare

programs and five residential childcare programs ultimately participating in the telephone survey/interview (Murrin, 2015). The results of these qualitative interviews indicate that 13 of 15 childcare surveyed received some sort of financial aid from federal, state, or nonprofit sources to help pay repair costs (Murrin, 2015). In both New York and New Jersey SSBG funding was used to help childcare recover, but there was a delay in its availability as reporting and allocation procedures had to be put into place (Murrin, 2015). Fourteen of the fifteen childcare interviewed were closed by Superstorm Sandy for some period of time, and three childcare indicated that there had been additional income losses as previous clients sought other childcare arrangements (Murrin, 2015). While this study is small and more descriptive of childcare program experience, it remains one of the only studies that exist that is exclusively concerned with childcare recovery.

The 2016 flooding in Baton Rouge, Louisiana and Hurricane Matthew in the Carolinas provided more examples of the impact disaster has communities and their childcare resources. According to Child Care Aware of America, over 6,000 children saw their childcare routine disrupted by childcare closures; close to a similar amount were affected in South Carolina by Hurricane Matthew (PR Newswire, 2016). Child Care Aware of America claims that almost 700 childcare were closed for one to up to eight months after Superstorm Sandy, with 100 childcare programs being helped by donations from Save the Children (PR Newswire, 2016). The survey results did not provide any additional insight into the success of this intervention, with the exception of one survey participant who indicated they had received grant funding from Save the Children.

Forums on the needs of children have been held after major disasters, but surprisingly, this has not spawned copious childcare-related research efforts. After Hurricane Katrina, the National Center for Rural Early Childhood Learning Initiatives at Mississippi State University hosted a forum on hurricane recovery and emergency preparedness for early childhood needs (Shores & Mississippi State Univ, 2006). After Superstorm Sandy, the Institute of Medicine of the National Academies held a workshop on disaster preparedness, response and recovery needs and considerations for families and children (Wizemann et al., 2014). Both of these forums highlighted the need to plan for childcare support as part of recovery efforts for children, their families, and the communities affected by disaster (Shores & Mississippi State Univ, 2006; Wizemann et al., 2014). Testimony before Congress indicated not only was childcare recovery critical to local economic recovery, but that is was failing (Senate Committee on Homeland Security and Governmental Affairs, Subcommittee on Disaster Recovery, 2009). Four years post-Katrina, Orleans Parrish in Louisiana was still operating at 51% of its pre-Katrina childcare capacity (Senate Committee on Homeland Security and Governmental Affairs, Subcommittee on Disaster Recovery, 2009). What has been documented about childcare recovery indicates that recovery is likely a long-term process, and worse, that childcare recovery is far from a logical conclusion.

Summary and Conclusions

This literature review has covered a variety of issues related to childcare recovery. First, this review has indicated a depth of analysis on children and disaster. Specifically, discussion of the emotional and physical vulnerabilities of children to disaster has been

covered. The ability of children to build or rebuild their own resiliency has also been addressed. The recovery needs of children, to include the need for structure, and the existence of a postdisaster safe environment, like one provided by childcare, has also been thoroughly covered. Chapter 2 also provided a definition and understanding of childcare as an industry as well as its value to society. Literature concerning the status of childcare disaster preparedness and its role in community recovery was reviewed. Recovery and resilience were defined and related policies and disaster recovery funding sources was discussed. Additionally, literature on small business recovery was reviewed. Ultimately, the very small slice of previous childcare recovery and Superstorm Sandy related recovery research were available for analysis.

Analysis of the aforementioned literature demonstrated a gap in understanding childcare recovery. Business recovery in general has only been superficially addressed and its results to date were less than conclusive. The literature review indicated a growing awareness of the importance of childcare as an enabler of community recovery and the recovery of children impacted by disaster. What was missing is empirical data on how childcare recovers, what factors help or hinder its recovery, and if recovery might be enabled through predictive analysis of the independent variables of this study.

Chapter 3 will address research design choice, rationale and methodology. Methodology discussions will cover the definition of population, sampling and sample procedures, recruitment participants and data collection. Instrumentation, variable operationalization, data analysis plan, including how ethical concerns and threats to validity will be mitigated will also be described in detail.

Chapter 3: Research Method

The purpose of this quantitative study was to examine how childcare program recovery time varied as a result of childcare type and disaster recovery funding used. Specifically, this study focused on childcare programs impacted by Superstorm Sandy in New York, New Jersey, and Connecticut. Perhaps through the results of this study, the importance of childcare recovery and the difficulties it faces can be highlighted and steps taken to better enable childcare recovery. Ultimately, I hope that policymakers might be able to use these results as an initial metric to improve postdisaster recovery funding options for childcare.

This chapter details research design choice and rationale. Next, I discuss methodology in depth, including population definition, sample procedures and sampling, participant recruitment, and data collection. I also address the instrumentation, variable operationalization, and the data analysis plan at length. I explain threats to validity and ethical concerns and mitigation efforts prior to chapter summary.

Research Design and Rationale

My intent for this study was to see if RDT could help explain childcare recovery success postdisaster. Childcare recovery success is identified through the dependent variable of recovery time (with a shorter time being an indicator of greater success than a longer time). Additionally, I hoped that this study might identify if a relationship existed between the independent variables of childcare type and recovery funding used. The hypotheses for the study's research questions were designed to determine three things: (a) to determine whether or not the RDT assumption that successful organizations engage in

diversification strategies could be proven to predict faster recovery times; (b) to determine if there was a significant relationship between the two independent variables; and (c) to determine whether a particular type of recovery funding, or combination of recovery funding, had more impact on recovery time than another. The hypotheses are listed below:

H_a1: There is a difference in recovery time when multiple forms of recovery funding are used.

H_a2: There is a difference in recovery time based on childcare type.

H_a3: There is a difference in recovery time based on the number of categories of childcare recovery funding used.

H_a4: Childcare type and recovery funding used do predict recovery length with respect to Superstorm Sandy.

This study used a quasi-experimental quantitative approach. I declined a qualitative approach because the intent of this study was to determine correlations and causation rather than analyze behavior, motivation, or other nonnumeric characteristics. Quantitative research tests a theory or a combination of theories through the examination of the relationship or relationships between variables (Park & Park, 2016). The quantitative research model was most appropriate for this study as the research questions were designed to determine how an independent variable, or combination of independent variables, impacted the dependent variable. This study's research questions were written so as to determine what relationship, if any, existed between independent variables upon

the dependent variable (Fraenkel, 2006; Frankfort-Nachmias et al., 2015; Wayne & Boissoneau, 1996).

I considered many quantitative research models before the quasi-experimental causal-comparative research model selection. I did not choose an experimental quantitative design as this study cannot manipulate variables or assign groupings (see Frankfort-Nachmias et al., 2015). I determined a quasi-experimental model that did not manipulate variables and worked with preestablished groups was appropriate. The option of a cross-sectional method selection was explored but was ultimately discarded as the intention behind this study was to not just describe the relationship between variables, but to understand causality (see Frankfort-Nachmias et al., 2015). A causal-comparative quasi-experimental model is used to explain the consequences of one or more independent variables upon a dependent variable (Fraenkel, 2006; Frankfort-Nachmias et al., 2015; Wayne & Boissoneau, 1996), and this goal aligned with the desired end state of this study.

The application of a quantitative method implied a larger sample size requirement to validate significant results. The population for this study spanned three states, New York, New Jersey, and Connecticut, this meant that collaboration and support requests for participation had to be sent to multiple agencies in three states. Despite this complication, the application of a quantitative causal-comparative quasi-experimental was ultimately the best choice for the goals of this research.

Primarily, qualitative research has been conducted on the impact of disaster on children, but little research exists with analysis of the impact of disaster on childcare

itself. There has been research that indicates that childcare, and the return of a predictable daily routine, aids the recovery of young children postdisaster (Berke & Campanella, 2006; Gil-Rivas & Kilmer, 2013; Peek, 2008). Prior research on children and disaster has been more often qualitative, but analysis of the literature indicates a gap in studies that examine the critical infrastructure, like childcare, that supports children. Compilation and analysis of data about the impact of disaster on childcare could enable not just a better understanding of how childcare recovers, but it might inform future studies on how the enabling of childcare recovery could promote community resiliency and maybe even shorten recovery times for children impacted by disaster.

Methodology

Population

The target population for this study included a finite population of childcare programs in New York, New Jersey, and Connecticut that were registered, licensed, certified, or accredited through state or city government agencies. Childcare programs are defined as the unit of measurement for this study. A rough estimate of this childcare program population included over 29,000 childcare organizations (New York City Department of Health and Mental Hygiene, n.d.; New York State Office of Children and Family Services, n.d.-b; State of Connecticut Office of Early Childhood, 2016; State of New Jersey Department of Children and Families, n.d.). This population excluded the category of informal childcare, defined as individuals not licensed by the state who provide care to children within the same geographic area. This excluded group is comprised of a variety of providers, like family members or relatives who provide

childcare support, and childcare providers that do not follow state licensing and registration requirements. This group was excluded due to its infinite nature as well as potential deviation from state licensing requirements, which could significantly impact variable analysis and skew results.

Sampling and Sampling Procedures

In this research I used a probability sampling strategy whenever possible. A probability sample is defined as a sample wherein all members of the designated population set have an equal chance of being selected for sample inclusion (Frankfort-Nachmias et al., 2015). Simple random or systemic sampling would have resulted in uneven variable category distributions. Equally disadvantageous would have been the application of a cluster sampling method. Cluster methods are best suited for research conducted in a specific geographic area, and in this case, the vast geographic reach of Superstorm Sandy precluded application of this technique (see Frankfort-Nachmias et al., 2015). Because the independent variable of childcare type comprised two categories, I desired a stratified sampling method. Stratified sampling balances research participant categories, thereby enabling analysis of more consistent and evenly distributed groups technique (Frankfort-Nachmias et al., 2015). Without sample stratification or explanation of differences in number values, the data could be significantly skewed, resulting in inaccurate conclusions about recovery funding value and variable relationships or correlation.

The sampling frame for this study was drawn from the population of childcare operating in New Jersey, New York and Connecticut that were registered, licensed,

certified, or accredited through state or city government agencies and had been identified as having been in operation during Superstorm Sandy in an affected area. To arrive at this smaller population set, only childcare meeting the aforementioned licensing or registration criteria that were located in counties included in Presidential Declarations of Major Disaster FEMA-4085-DR (New York), FEMA-4086-DR (New Jersey), and FEMA-4087-DR (Connecticut) were potentially available for contact. For the purpose of this study, impacted by Superstorm Sandy refers to those childcare programs that were closed due to damage resulting from Superstorm Sandy that were unable to return to operations.

The sample unit for this study was the childcare program. Obtainment of a single list or all-inclusive sampling frame was not possible. Wizemann et al. (2014) reported that over 697 childcare organizations were closed for an unspecified period of time due to Superstorm Sandy, with the actual number likely being much higher. It was not possible to obtain a list of affected childcare programs, but with the exception of residential childcare programs in New Jersey, public records of childcare programs in operation during the aforementioned period and mailing addresses were available. Various childcare advocacy programs were contacted and many did forward survey invitations through their state distribution lists. Sampling frame error mitigation requires an accounting for incomplete frames. Current lists of childcare programs in the aforementioned states would not reflect childcare no longer in operation, so if these childcare programs had closed as a result of Superstorm Sandy, they would potentially create a sampling frame error (see Frankfort-Nachmias et al., 2015). The survey

specifically included questions to help limit data inclusion to childcare programs that were affected by Superstorm Sandy attempting to address this issue.

An effect size was needed before a sample size could be ascertained. Analysis of the literature failed to conclusively determine an average effect size noted in relation to RDT application, but effect sizes annotated were within the moderate to medium range (Drees et al., 2013; K. K. Powell & Rey, 2015; Zhang et al., 2009). As a result, the effect size of 0.40 was chosen for this analysis. This effect value was put into G*Power 3.1.9.3. A power value of 0.80 and an α err prob of 0.05 were also selected. The numerator df had to be determined for this problem. This was done through the following equation that took into consideration all independent variable factors and replications. *CHILDCARE TYPE* comprised two groups and *RECOVERY FUNDING* comprised three groups. The number of replications for this study was three. To determine the numerator df, the following equation was used:

$$\text{Numerator df} = (2_{CHILDCARE\ TYPE} - 1) + (3_{RECOVERY\ FUNDING} - 1) + (2_{CHILDCARE\ TYPE} - 1)\ (3_{RECOVERY\ FUNDING} - 1) + (2_{CHILDCARE\ TYPE})(3_{RECOVERY\ FUNDING})(3_{REPLICATIONS} - 1)$$

The resulting numerator df = 17 was entered. Group number was established by multiplying the number of groups in each independent variable, thereby obtaining a group number of 6. Because this problem had two independent variables, the ANOVA fixed effects, special, main effects and interactions test was selected. The aforementioned input resulted in a recommended sample size of 137. I used a stratified random sampling method to try to obtain this sample size with a desired minimum of at least 69 participants in each of the two groups of *CHILDCARE TYPE*.

Procedures for Recruitment, Participation, and Data Collection (Primary Data)

Childcare participation was sought from a variety of sources. Lists of childcare programs registered with the state and in operation during and before Superstorm Sandy made landfall were either obtained from state licensing agencies and open sources, else childcare programs were contacted through advocacy organizations with childcare distribution lists, or childcare resource and referral agencies in the Superstorm Sandy affected states. Coordination with advocacy organizations, state licensing organizations, and other emergency management contacts in the affected regions was sought to help advertise and encourage study participation and provide an outlet for sharing results. Additional coordination through e-mail and social media with childcare resource and referral organizations and directors of childcare programs was conducted to recruit more survey participants.

Participants were contacted via mail and electronically (when e-mail addresses were available) about this survey. All invitees were provided background information as well as the survey link. Data was collected via SurveyMonkey. SurveyMonkey allowed for the creation of a tailored consent form that made consent a requirement before any additional survey questions could be answered. Participants could end the study (Appendix) at any time by simply exiting from the survey. Demographic data collected for this study included: location of childcare (state and county), if the childcare is private or publicly owned, forprofit or nonprofit, the type of childcare (residential or nonresidential), if the facility used was owned or rented/leased, the number of years in operation, if it was part of a corporation (e.g., Childtime, Goddard, KinderCare, Bright

Horizons, etc.,) and if the owner was also the childcare director. Other data for analysis included the following: number of days closed (past restoration of public services) due to damage to facility, cost of repairs, type of recovery funding used (e.g., savings, insurance, grants, loans, etc.,) amount of money spent, and perceived value or importance of each type of recovery funding. An executive brief or paper outlining the research results will be made available to survey participants via state licensing agencies, childcare resource and referral agencies, childcare advocacy organizations, or other organizations that provided survey invitation support. The intent is to make the research results available to childcare programs in the affected states, regardless of survey participation.

Subject Matter Experts

The utilization of subject matter experts increases confidence about an instrument's validity, specifically content validity. For this study, experts in the childcare field were asked to evaluate the survey questions to see if they correctly described the variables being measured and they were asked to help validate question terminology. Childcare subject matter experts were professionals selected from nationally recognized childcare professionalization organizations or were chosen due to their status as prominent children and disaster researchers or childcare advocates.

Instrumentation and Operationalization of Constructs

The instrument for this study was an online questionnaire I developed. Preexisting surveys did not exist so tailored questions had to be constructed. These survey questions were tested through subject matter expert analysis. Instrument validity was also addressed.

Instrument reliability. Instrument reliability is a measurement of result consistency using the same instrument; in other words are the measurements consistent across application (Frankfort-Nachmias et al., 2015). This study did not utilize scale questions and almost all of the data collected was categorical in nature. Due to these criteria, instrument reliability cannot be measured.

Instrument validity. Instrument validity is defined as the degree that a given instrument, in case a survey instrument, measures what it was designed to measure (Frankfort-Nachmias et al., 2015). Construct validity of this instrument was established through provision of evidence of content and criterion-related or empirical validity (Kimberlin & Winterstein, 2008). Face validity is a type of content validity that measures an expert's subjective analysis that a given instrument accurately captures what it is designed to do (Frankfort-Nachmias et al., 2015). No current external criteria exist to measure this study's desired data, so a comparative "Gold Standard" is not available, making construct validity the most significant validity determinate for this instrument (Frankfort-Nachmias et al., 2015).

Extensive literature review revealed that almost no research had been conducted on childcare recovery. Many of the studies conducted to prove or advance RDT focused on literature reviews or survey instruments whose question focus precluded application to this study's research questions (Davis & Cobb, 2010; Drees et al., 2013; Hillman et al., 2009; Zhang et al., 2009). Concurrently, studies conducted from a business vulnerability theory perspective occasionally included childcare, but their instrumentation was either qualitative, or based on assessment of a different unit of measure – i.e., the childcare

owner – and evaluation of individual characteristics rather that recovery funding used to explain recovery potential or results (Marshall et al., 2015; Tierney, 2007; Wasileski et al., 2011; Webb et al., 2002; Zhang et al., 2009). Development of a tailored survey instrument allowed for answering the desired research questions in the vernacular most appropriate for the childcare community.

Operationalization of Variables

The first independent variable in this study was childcare type. Childcare type was a nominal, nonhierarchical variable. It was defined as being comprised of one of two categories, residential or nonresidential. The first category, residential childcare, included any childcare program (usually a sole proprietorship) that was required to be licensed or registered with the state that provided childcare services from the childcare provider's home. The residential category included:

- In New Jersey - registered family childcare providers or childcare centers operating within a residence (State of New Jersey Department of Children and Families, 2017a, 2017b).
- In New York - family day care homes and group day care homes operating out of a residence (New York State Office of Children and Family Services, n.d.-a).
- In Connecticut -family child care homes and group child care homes that operate out of a residence (Connecticut Office of Early Childhood, 2017).

The second category, nonresidential childcare, included any childcare program that was required to be licensed or registered with the state that provided childcare services

outside the childcare provider's home. Childcare provider ownership or rental of the facility in use did not change applicability to this group membership. The nonresidential category included:

- In New Jersey - licensed childcare centers (State of New Jersey Department of Children and Families, 2017a, 2017b; State of New Jersey Department of Human Services Division of Family Development, 2016). Within this category Pre-kindergarten and kindergarten programs, or child care centers that were run by and were considered a key part of a private educational institution in New Jersey defined to be a private educational institution exempt from licensure but for the purpose of this study were still measured in this category (State of New Jersey Department of Children and Families, 2017b).
- In New York - child day care centers, school age child care programs, and small day care centers (New York State Office of Children and Family Services, n.d.-a).
- In Connecticut - child care centers and group child care homes that operated outside the childcare provider's home (Connecticut Office of Early Childhood, 2017).

The second independent variable was recovery funding and was also nominal in value. This variable was comprised of three funding attributes: predisaster sources, postdisaster sources, or a combination of both. Predisaster sources included insurance and savings. While insurance payments clearly occur postdisaster, the obtainment of adequate

insurance to cover disaster costs happens before the disaster, so it was included in the predisaster category. Personal or business savings used were also considered predisaster mitigation funding. Postdisaster sources included loans and grants. Loans could be from the SBA, from financial institutions, or from friends and family. Grants could have come from the government, such as in the case of IHA or PA grants. They can also have been given from the state in various forms such as the SSBG. Additionally, grants could have been provided from religious or charitable organizations. Demographics were collected that provided greater fidelity on which type of postdisaster funding was used.

The dependent variable in this study was recovery time and it was measured as a whole number integer. It was continuous and was a ratio measurement defined by the number of days a Superstorm Sandy affected childcare was not in operation postdisaster.

Data Analysis Plan

The first step in this data analysis plan entailed data cleaning and handling of relevant assumptions. Statistical Package for the Social Sciences (SPSS) 25.0 was used for data analysis. After the data was collected by the SurveyMonkey instrument descriptive statistics were conducted for all variables. The distribution of the dependent variable recovery time was tested to see if it met normality assumptions and if parametric or nonparametric testing was needed. All variables were tested for outliers. Missing data assumptions were also handled. A frequency table helped determine if data is missing. If missing data was discovered, those cases were deleted or not included in the analysis of appropriate research questions (Mertler & Vannetta, 2013).

Research Question 1

Research question one asked: What, if any, is the difference in recovery time when multiple forms of recovery funding are used? The first hypothesis stated that there is a difference in recovery time for childcare programs that used multiple forms of recovery funding. To analyze the first hypothesis, one-way ANOVA(s) was conducted to assess whether use of multiple forms of recovery funding had a significant impact on recovery time. No literature had previously been found that indicated a relationship between these variables. Assumptions for one-way ANOVA include a normal distribution of the dependent variable across each population group, equal dependent variable variance for each population and independence of cases and score (Green & Salkind, 2014).

Research Question 2

Research question two asked: What, if any, is the difference in recovery time based on childcare type? The second hypothesis stated that there was a difference in recovery time based on childcare type. To analyze the second hypothesis, a one-way analysis variance (ANOVA) was used to assess the relationship between type of childcare and the recovery time. No literature had previously been found that indicated a relationship between these variables either. The assumptions of bias containment, data accuracy, normality, and sphericity were all tested for as applicable (Field, 2013).

Research Question 3

Research question three asked: What, if any, are the differences in recovery time based on number of categories of childcare recovery funding used? The third hypothesis

stated that there was a difference in recovery time based on the number of categories of childcare recovery funding used. To analyze the third hypothesis, a one-way analysis of variance (ANOVA) was used to first determine if the number of recovery funding categories used had an effect upon the childcare program recovery time. All aforementioned assumptions relevant to research question two were also addressed for research question three.

Research Question 4

Research question four asked: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy? The fourth hypothesis stated that childcare type and recovery funding used do predict recovery length with respect to Superstorm Sandy. To analyze the fourth hypothesis, a factorial analysis of variance (ANOVA) was used to assess how childcare type and recovery funding used interact to predict recovery time. The aforementioned assumptions relevant to factorial ANOVA were addressed for research question four.

Threats to Validity

External Validity

External validity is threated by incorrect application of research results to other populations, settings or situations (Reed, McCray-Sorrells, Cole, & Takakawa, 2013). Two key components of external validity are ecological and population validity. Ecological validity is concerned with the setting of the intervention and population validity focuses on the sample population (Reed et al., 2013).

Many ecological validity concerns were removed due to the quasi-experimental nature of this study, and also due to the fact that no treatments or variable manipulation were applied. For example, since no treatments were applied, concerns about interaction of history and treatment, interaction of selection and treatment, and interaction of setting and treatment were controlled for (Reed et al., 2013). Since this was not a study that employed pretest/post application, reaction of interaction effect of testing was also not applicable. Finally, since this was a quasi-experimental rather than an experimental study, the absence of a laboratory environment or application of treatment also mitigated the reactive effects of the experimental arrangements threat to ecological validity.

Population validity is a type of external validity concerned with generalizability. It primarily asks how representative the sample population is. The more representative a population the higher confidence can be held in research generalization (Reed et al., 2013). The population surveyed were childcare program owners or directors in three different states who experienced a hurricane event. It is fair to assume that these childcare programs may operate differently than other childcare programs in any other given state. Additionally, the demographics of these owners or directors could be vastly different than in other states. While these differences could affect generalizability, this survey was not about individuals as much as it sought to establish baseline information on what childcare recovery looked like. Had this study addressed the individual childcare program director or owner motivations for actions in greater detail, rather than focusing on childcare programs as the unit of measurement, generalizability could have been a more difficult challenge to establish. Because this study employed a stratified rather than random

sampling method, it should be more representative of the overall childcare population in the affected areas. This study's sample population spanned three states. While this population sample is limited to childcare affected to Superstorm Sandy, generalizability may be further confirmed in future assessment of the recovery success of childcare programs affected by Hurricane Harvey or Hurricane Irma.

Internal Validity

Internal validity is threatened by issues within research design, such as the procedures used, or by the experiences of the sample population that might influence responses (Flannelly, Flannelly, & Jankowski, 2018). Confounding variables can influence internal validity. This study sought to establish causality, and could have been subject to issues of confounding variables. The designation of a childcare program as the unit of measurement rather than a childcare provider helped limit potential confounding variables. Many of the threats to internal validity were not applicable to this study (e.g., maturation, history, testing, regression, diffusion of treatment, compensatory demoralization or rivalry, or instrumentation) because there was no treatment applied nor did a pre- and posttest experiment construct exist (Creswell, 2009; Flannelly et al., 2018). Selection threats to internal validity were primarily controlled through application of a random stratified sampling strategy. Mortality could threaten internal validity, but a larger sample size would have best mitigated this potentiality. Overall, internal validity threats in this study were low and were mostly mitigated through good research practices.

Construct Validity

Construct validity is the validation that what is being measured actually reflects the intended theoretical framework (Frankfort-Nachmias et al., 2015; Worley, Doolen, Mitchell, Farris, & Van Aken, 2008). In the instance of this study, were the questions used to measure the variables truly measuring what they are labeled as? The independent variables were both categorical and broad enough that this issue was mitigated.

Construct validity is established through evidence of content and criterion-related or empirical validity (Kimberlin & Winterstein, 2008). Content validity is comprised of face validity and sampling validity (Frankfort-Nachmias et al., 2015). Face validity was established through utilization of childcare and children and disaster subject matter experts who helped validate terminology used for questions and determined independent variables measurements. Sampling validity is defined as how well the instrument correctly captures what is being measured (Frankfort-Nachmias et al., 2015). Empirical validity is determined through the strength of the relationship between the measured outcomes and the instrument used for measuring (Frankfort-Nachmias et al., 2015). The questionnaire utilized was specifically created and tailored for this research. It was reviewed by subject matter experts, but it lacked a comparative measurement by another instrument to help validate it empirically.

Ethical Procedures

Prior to any data collection, Walden's Internal Review Board (IRB) approval (IRB # 09-20-18-0618745) was obtained. The National Institute of Health's "Protecting Human Research Participants" training on informed consent was also completed prior to

IRB submission. Consent to participate in the research was obtained through the instrument at the beginning of the survey. Additionally, a thorough explanation of participant privacy and rights expectations was provided. Understanding of these rights and consent to participate was required through a yes/no statement prior to being allowed to continue with the survey. Each study participant was assigned a unique case number through SurveyMonkey. An organization's name, address, and any other identifying data that might be submitted by participants was protected and will not be used or reported in the research conducted. All survey participants were anonymous and no identifying data was available to me.

No sensitive data was collected, but data on financial expenditures could be deemed sensitive to survey participants, so this again enforced the requirement to protect the privacy and anonymity of survey participants. Some of the data being sought could be implied as social or economic loss, however data on credit scores, or remainder asset amounts were not collected, so this concern was minimal. Many of these potential concerns were mitigated through question criteria selection. For example, data was sought about whether a loan was obtained through a financial institution or other means, but the study did not ask for amounts or lender information. Limiting the collection of identifying data helped protect participant privacy.

Data collection and storage security was also a high priority. Data was collected online via SurveyMonkey and processed for analysis upon receipt. Upon receipt, data was kept in password protected folders or files on a personal computer. Upon completion of the study the data was moved to a secure password protected or encrypted file location.

The collected data was not shared, but the results, once the dissertation has been approved, were made available to survey participants and via various publication means (e.g., dissertation, follow on academic articles, etc.). An executive article version of the data results was made available to childcare licensing organizations in the affected states as well as to the organizations that helped distribute information about the study and served as subject matter experts for the survey validation.

Personal bias is a potential ethical issue that must be addressed. My work in emergency management and childcare disaster preparedness has led me to the conclusion that childcare suffers from recovery limitations. At the same time, there is no to little data available that validates this conclusion. I hoped with my research not to necessarily validate this conclusion, but provide baseline data that could help better define what the true childcare recovery situation was so that further analysis could be done. Any potential for personal bias in this study was mitigated through methodological applications. This study did not utilize a laboratory or experimental setting, so desirability, experimenter, and measurement artifacts bias, were not applicable (Frankfort-Nachmias et al., 2015). Because bias may still have occurred during the data collection and analysis, definition and following of data collection and analysis protocols was applied as a mitigation strategy.

Summary

To have value, a researcher's methods must be clear and repeatable (Frankfort-Nachmias et al., 2015). Research methodology, design and selection rationale were described. Sampling procedures and strategies were subsequently addressed and potential

issues identified. Effect size estimation was explained and a sample population calculated. Participant recruitment, participation, and data collection procedures were identified and described in detail. Instrumentation and operationalization of constructs and variables were outlined in great detail. The data analysis plan was articulated and assumption requirements for all research questions addressed. Threats to internal, external, and construct validity were identified, as were mitigation strategies for employment. Finally, ethical procedures were outlined. A comprehensive analysis of the survey results will be addressed in chapter 4.

Chapter 4: Results

Chapter 4 begins with a review the purpose statement and the study research questions and hypotheses. Next, I present a detailed explanation of the data collection processes, recruitment, timelines and response rates will be addressed. Finally, study results .

The purpose of this quantitative study was to research how childcare program recovery time varied as a result of childcare type and recovery funding used. This study focused specifically on childcare programs impacted by Superstorm Sandy in New York, New Jersey, and Connecticut. The study included two independent variables. The first independent variable was childcare type. The second independent variable was recovery funding used. Recovery time was the dependent variable and was measured in days.

The following research questions and hypotheses were used to evaluate the variables in this study. My intent was to determine if application of RDT could help explain childcare recovery success or failure. Additionally, I wanted to determine what the relationship was (if any) between childcare type and recovery funding used in regard to postdisaster childcare program recovery time.

RQ1: What, if any, is the difference in recovery time when multiple forms of recovery funding are used?

$H_0$1: There is no difference in recovery time when multiple forms of recovery funding are used.

H_a1: There is a difference in recovery time when multiple forms of recovery funding are used.

RQ2: What, if any, is the difference in recovery time based on childcare type?

$H_0$2: There is no difference in recovery time based on childcare type.

H_a2: There is a difference in recovery time based on childcare type.

RQ3: What, if any, are the differences in recovery time based on the number of categories of childcare recovery funding used?

$H_0$3: There is no difference in recovery time based on the number of categories of childcare recovery funding used.

H_a3: There is a difference in recovery time based on the number of categories of childcare recovery funding used.

RQ4: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy?

$H_0$4: Childcare type and recovery funding used do not predict recovery length with respect to Superstorm Sandy.

H_a4: Childcare type and recovery funding used do predict recovery length with respect to Superstorm Sandy.

Data Collection

Data collection proved exceptionally hard and there were numerous recruitment challenges to overcome. The first challenge was perhaps due to the significant time lapse since the event (6 years). Interest in participation may have waned due to the long-time span that had passed. Secondly, there was an inability to identify childcare programs affected by Superstorm Sandy for more selective invitation targeting. For most states, lists of nonresidential childcare programs could be found in public databases. These

childcare programs were selected for potential invitation based on each childcare program having been registered and in operation within the Superstorm Sandy affected disaster counties since 2011 or before. Information on residential-based childcare was more challenging, with some states, like New Jersey, not requiring these small childcare programs to register. This resulted in an inability to find complete addresses of residential programs to send invitations to. Additionally, none of the open source databases provided e-mail contact information, which made data collection more costly and potentially impacted response rates with a limited means of reminder notification options available. Finally, the timing of the study was potentially problematic as it covered several holidays and typical stand down or vacation periods (i.e., Thanksgiving, Christmas, and New Year's Eve).

I searched each state's database for childcare programs that met the study criteria. From that list a number were randomly selected for survey invitation. Letters of invitation were mailed to 1,606 childcare programs across Connecticut, New York, and New Jersey. One hundred and twenty-nine of these letters were returned as undeliverable or vacant, putting the total number of childcare programs contacted via mail at 1,477. I contacted childcare resource and referral agencies as well as other childcare advocacy agencies and engaged social media to put out survey participation requests. The study was open from October 28, 2018 through January 20, 2019. 114 responses were submitted via SurveyMonkey. This resulted in an extremely low response rate of 7.7%. Because it was not possible to narrow the survey invitation targeting to just childcare programs identified as affected by Superstorm Sandy, invitations had to be sent somewhat blindly to childcare

programs that were located in areas declared as disaster zones due to Superstorm Sandy. Ultimately, this meant that many childcare programs that were not affected were invited to participation and many that might have been were not individually invited. Of the 114 responses received, an additional 38 were removed as not qualified to participate (either not from the affected area or they self-identified as not being the director or owner of the childcare program, which was a study requirement) and this left the qualified participant study amount at 76, which was significantly below the 136 identified as desired in the initial sample size estimation.

While the sample population was smaller than desired, it remained representative of the larger childcare program population. Participants were identified through a random stratified approach which selected childcare programs for invitation based on childcare type, location (in a Superstorm Sandy disaster declaration zone within Connecticut; New York, divided by New York City and other New York counties; or New Jersey) and as having been in operation at least since 2011 or earlier. Additionally, childcare resource and referral agencies sent out e-mail invitations to their entire childcare program distribution lists in these affected counties so there was an equal chance of any childcare program responding to the survey invitation. Table 1 shows the distribution of childcare programs that participated across all three states. The majority of survey participants were from New Jersey, but the entire state of New Jersey was located within a disaster declaration zone, so this greater emphasis on New Jersey does not make this sample less representative necessarily.

Table 1

Childcare Programs by State

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Connecticut	8	10.5	10.5	10.5
	New Jersey	55	72.4	72.4	82.9
	New York (not NYC)	8	10.5	10.5	93.4
	New York City	5	6.6	6.6	100.0
	Total	76	100.0	100.0	

Table 2 shows the distribution of residential to nonresidential childcare across all three states and within New York City. With the exception of New York City, there are survey participants of both childcare type groups across all locations.

Table 2

Childcare Type Across States

		Residential	Nonresidential	
Childcare State	Connecticut	5	3	8
	New Jersey	10	41	51
	New York (not NYC)	3	4	7
	New York City	0	4	4
Total		18	52	70

Table 3 shows the distribution of survey participants in Connecticut. FEMA-4087-DR (Connecticut) cited disaster declarations in four counties. The survey results indicted participation by childcare in two of the four counties.

Table 3

Childcare by County in Connecticut

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Fairfield	5	6.6	62.5	62.5
	New Haven	3	3.9	37.5	100.0
	Total	8	10.5	100.0	
Missing	System	68	89.5		
Total		76	100.0		

Table 4 shows the distribution of survey participants in New Jersey. FEMA-4086-DR (New Jersey), cited disaster declarations in all 21 counties. The survey results indicted participation by childcare in 17 of the 21 counties.

Table 4

Childcare by County in New Jersey

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Bergen	4	5.3	7.4	7.4
	Burlington	3	3.9	5.6	13.0
	Cape May	1	1.3	1.9	14.8
	Cumberland	1	1.3	1.9	16.7
	Essex	7	9.2	13.0	29.6
	Hudson	4	5.3	7.4	37.0
	Hunterdon	3	3.9	5.6	42.6
	Mercer	2	2.6	3.7	46.3
	Middlesex	1	1.3	1.9	48.1
	Monmouth	8	10.5	14.8	63.0
	Morris	4	5.3	7.4	70.4
	Ocean	4	5.3	7.4	77.8
	Passaic	3	3.9	5.6	83.3
	Somerset	2	2.6	3.7	87.0
	Sussex	4	5.3	7.4	94.4
	Union	1	1.3	1.9	96.3
	Warren	2	2.6	3.7	100.0
	Total	54	71.1	100.0	
Missing	System	22	28.9		
Total		76	100.0		

Table 5 shows the distribution of survey participants in New York. FEMA-4085-DR (New York) cited disaster declarations in nine counties. New York County includes the five boroughs of New York City. The survey results indicted participation by childcare programs in 8 of the 9 counties.

Table 5

Childcare by County in New York

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Kings	2	2.6	15.4	15.4
	Nassau	3	3.9	23.1	38.5
	New York	2	2.6	15.4	53.8
	Queens	1	1.3	7.7	61.5
	Richmond	1	1.3	7.7	69.2
	Sullivan	2	2.6	15.4	84.6
	Ulster	1	1.3	7.7	92.3
	Westchester	1	1.3	7.7	100.0
	Total	13	17.1	100.0	
Missing	System	63	82.9		
Total		76	100.0		

The aforementioned tables provide a baseline descriptive illustration of the study sample and its representative nature of the childcare programs affected by Superstorm Sandy.

Study Results

The survey asked a variety of demographic questions whose results bear discussion and potentially, further analysis. Survey participants were asked to self-identify as childcare program directors, childcare program owners, or if they filled both roles at the time of Superstorm Sandy. Table 6 indicates that almost 56.6% of the survey participants were directors, and the remaining 43.4% were either childcare program owners or filled the role of both owner and director.

Table 6

Owner/Director Descriptive Statistics

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Director	43	56.6	56.6	56.6
	Owner	15	19.7	19.7	76.3
	Director & owner	18	23.7	23.7	100.0
	Total	76	100.0	100.0	

Survey participants were asked how long their childcare program had been in operation when Superstorm Sandy made landfall in 2012. The results indicated a range of one to 99 years with a mean of 20.89 (Table 7). Figure 1 illustrates the frequency distribution of how long childcare programs who participated in the survey were in operation.

Table 7

Number of Years in Operation

N	Valid	76
	Missing	0
Mean		20.89
Std. Error of Mean		2.037
Median		15.50
Std. Deviation		17.757
Minimum		1
Maximum		99

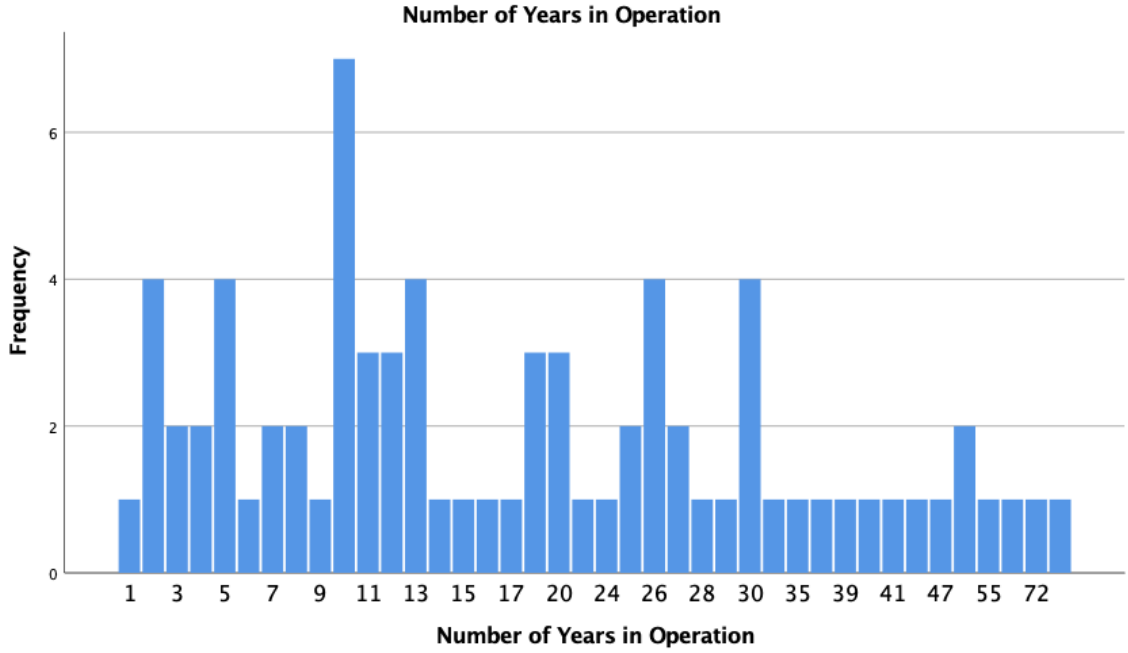

Figure 1. Number of years in operation.

Survey participants were asked if their childcare program was still in operation and if not, had the closure been due to Superstorm Sandy. Two participants indicated that their childcare programs had closed (one in 2015 and the other in 2018) respectively. Neither affirmed their closure was a result of Superstorm Sandy. Childcare programs indicated that 39.5% of the childcare programs operated in leased locations and 50% in of the childcare programs owned the building in which their childcare program operated from (Table 8). Participants were also asked if their childcare program was nonprofit or forprofit. A majority of participants, 55.3% indicated their childcare program was forprofit, with 32.4% indicating they were a nonprofit organization (Table 9). Table 9 also illustrated that over 10% of childcare programs participating in the survey were either state / federally funded or mixed funding.

Table 8

Location Status of Childcare

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Other (please specify)	2	2.6	2.6	2.6
	Leased or rented at the time of Superstorm Sandy impact?	30	39.5	39.5	42.1
	Owned at the time of Superstorm Sandy impact?	38	50.0	50.0	92.1
	"Located within a Church"	3	3.9	3.9	96.1
	Located within a public school	3	3.9	3.9	100.0
	Total	76	100.0	100.0	

Table 9

Childcare Structure and Funding Status

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Nonprofit?	26	34.2	34.2	34.2
	Privately owned (forprofit)?	42	55.3	55.3	89.5
	State or Federally funded?	1	1.3	1.3	90.8
	Mixed funding (either forprofit or nonprofit mixed with state or federal funding)?	7	9.2	9.2	100.0
	Total	76	100.0	100.0	

Table 10 shows that 18.4% of survey participants operated a childcare that was either franchised or part of a larger childcare program corporation. According to the data in Tables 9 and 10, almost 33% of forprofit childcare programs in this study were either franchised or part of a corporation.

Table 10

Childcare Franchise or Corporation Status

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Corporation/franchise	14	18.4	18.4	18.4
	No	62	81.6	81.6	100.0
	Total	76	100.0	100.0	

Childcare programs were asked how long, how many days, their program was closed as a result of Superstorm Sandy. Participants (n = 70) indicated a mean of 12.33 days closed due to Superstorm Sandy (Table 11). Figure 2 indicates that a most childcare programs in this study sample were closed two weeks are less – some with no closures and two with significantly high closure rates of 150 and 250 days respectively.

Table 11

Recovery Time

N	Valid	70
	missing	6
Mean		12.33
Std. error of mean		4.129
Median		5.00
Std. deviation		34.550
Variance		1193.673
Range		250
Minimum		0
Maximum		250

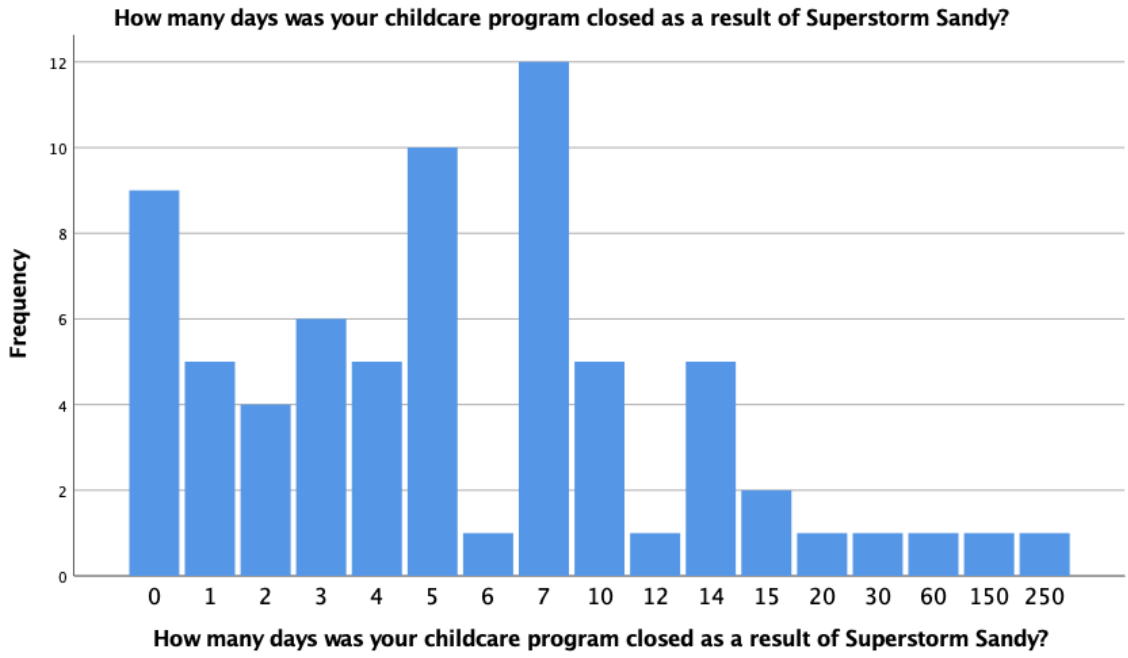

Figure 2. Number of days closed due to Superstorm Sandy.

The study also asked a number of questions about storm damage amounts, and what types of funding was used for repairs or rebuilding. Over one-third (36.8%) of participants indicated that they had incurred some cost to repair or reopen their childcare program after Superstorm Sandy (Table 12). Table 13 illustrates the extent of damage childcare programs who participated in the survey experienced. The majority (73.7%) of the childcare programs in the survey experienced $4,999 or less of damage, but 14.5% of childcare programs experienced damage costs from $5,000 to $10,000. No childcare programs experienced damage in the $10,001 to $25,000 cost range (Table 13). One survey participant experienced damage in the $25,001 to $50,000 range, another in the $50,001 to $100,000 range and a final one in the greater than $500,000 range (Table 13).

Table 12

Cost to Repair or Reopen

		Frequency	Percent	Valid percent	Cumulative percent
Valid	No.	42	55.3	60.0	60.0
	Yes	28	36.8	40.0	100.0
	Total	70	92.1	100.0	
Missing	System	6	7.9		
Total		76	100.0		

Table 13

Extent of Damage

		Frequency	Percent	Valid percent	Cumulative percent
Valid	< $5,000	56	73.7	80.0	80.0
	$5,001 - $10,000	11	14.5	15.7	95.7
	$25,001 - $50,000	1	1.3	1.4	97.1
	$50,001 - $100,000	1	1.3	1.4	98.6
	>$500,000	1	1.3	1.4	100.0
	Total	70	92.1	100.0	
Missing	system	6	7.9		
Total		76	100.0		

Predisaster resources were defined in this study as financial resources that are obtained prior to the disaster like insurance or savings. Childcare programs were asked to identify which predisaster resources they applied, and how valuable they assessed these predisaster resources to be. Additionally, childcare programs were asked if the insurance they had was adequate and if determined that it was not, what reasons were given for why it was not sufficient. Table 14 demonstrates the breakdown of predisaster funding

resources used by (n = 33) survey participants. The 51.6% of (n = 33) participants used some form of insurance to cover Superstorm Sandy damages (Tables 14). 30.2% of those surveyed used business savings, personal savings, or a combination of both types of savings to help with recovery.

Table 14

Predisaster Resources Used

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Business property insurance	2	2.6	6.1	6.1
	Commercial insurance	6	7.9	18.2	24.2
	Homeowner's insurance	2	2.6	6.1	30.3
	Vehicle insurance	1	1.3	3.0	33.3
	Business savings	5	6.6	15.2	48.5
	Personal savings	4	5.3	12.1	60.6
	Other	5	6.6	15.2	75.8
	Business & commercial insurance	6	7.9	18.2	93.9
	Business & personal savings	1	1.3	3.0	97.0
	Homeowner insurance & personal savings	1	1.3	3.0	100.0
	Total	33	43.4	100.0	
Missing	system	43	56.6		
Total		76	100.0		

Survey participants were asked the perceived value of different predisaster recovery resources. Table 15 indicates that the majority of (n = 62) survey participants, 78.3%, found either no value or no applicability for business property insurance in their recovery efforts. 9.7% of survey participants felt that it provided some help, 4.8% felt that it had a significant impact on their recovery or that it made a difference and 9.7% felt

they could not have done without it (Table 15). Results for the evaluation of commercial business liability insurance were similar to those of business property insurance. 78.3% of survey participants (n = 60) found either no value or no applicability for commercial business liability insurance in regards to recovery from Superstorm Sandy (Table 16). 10% of survey participants felt that it provided some help, 3.3% felt that it had a significant impact on their recovery or that it made a difference and 8.3% felt they could not have done without it (Table 16). Table 17 indicated that the majority of (n = 64) survey participants, 90.6%, found little to no value or applicability for homeowner's insurance in regards to recovery. 6.3% of survey participants felt that it provided some help and 3.1% felt they could not have done without it (Table 17). Table 18 indicated the majority of (n = 61) survey participants, 96.7%, found little to no value or applicability for vehicle insurance in regards to their recovery from Superstorm Sandy. One survey participant felt that it provided some help and one other survey participant felt it could not have been done without (Table 18). All survey participants (n = 60) found no value or no applicability for personal insurance in their Superstorm Sandy recovery experiences (Table 19). Table 20 indicated that the majority of (n = 60) survey participants, 73.3%, found either no value or no applicability for business savings in their recovery efforts. 11.7% of survey participants felt that it provided some help, 6.7% felt that it had a significant impact on their recovery or that it made a difference and 8.3% felt they could not have done without it (Table 20). Table 21 indicates that the majority of (n = 63) survey participants, 84.1%, found either no value or no applicability for personal savings in their recovery efforts. 12.7% of survey participants felt that it provided some help and

3.2% felt they could not have done without it (Table 21). Survey participants were asked to assess the value of other predisaster resources applied in Superstorm Sandy recovery. Table 22 indicates that 94.5% of survey participants (n = 55) found little to no value or applicability in application of other resources. One survey participant found that application of other resources had a significant impact on their recovery or that it made a difference and two survey participants felt they could not have done without it (Table 22).

Table 15

Business Property Insurance Value

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not applicable	34	44.7	54.8	54.8
	No value at all	13	17.1	21.0	75.8
	Provided some help	6	7.9	9.7	85.5
	Had a significant impact (made a difference)	3	3.9	4.8	90.3
	Could not have done without	6	7.9	9.7	100.0
	Total	62	81.6	100.0	
Missing	system	14	18.4		
Total		76	100.0		

Table 16

Commercial Business Insurance Value

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not applicable	34	44.7	56.7	56.7
	No value at all	13	17.1	21.7	78.3
	Provided some help	6	7.9	10.0	88.3
	Had a significant impact (made a difference)	2	2.6	3.3	91.7
	Could not have done without	5	6.6	8.3	100.0
	Total	60	78.9	100.0	
Missing	system	16	21.1		
Total		76	100.0		

Table 17

Homeowner's Insurance Value

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not applicable	44	57.9	68.8	68.8
	No value at all	14	18.4	21.9	90.6
	Provided some help	4	5.3	6.3	96.9
	Could not have done without	2	2.6	3.1	100.0
	Total	64	84.2	100.0	
Missing	system	12	15.8		
Total		76	100.0		

Table 18

Vehicle Insurance Value

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not applicable	47	61.8	77.0	77.0
	No value at all	12	15.8	19.7	96.7
	Provided some help	1	1.3	1.6	98.4
	Could not have done without	1	1.3	1.6	100.0
	Total	61	80.3	100.0	
Missing	System	15	19.7		
Total		76	100.0		

Table 19

Personal Insurance Value

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	48	63.2	80.0	80.0
	No value at all	12	15.8	20.0	100.0
	Total	60	78.9	100.0	
Missing	system	16	21.1		
Total		76	100.0		

Table 20

Business Savings Value

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	37	48.7	61.7	61.7
	No value at all	7	9.2	11.7	73.3
	Provided some help	7	9.2	11.7	85.0
	Had a significant impact (made a difference)	4	5.3	6.7	91.7
	Could not have done without	5	6.6	8.3	100.0
	Total	60	78.9	100.0	
Missing	system	16	21.1		
Total		76	100.0		

Table 21

Personal Savings Value

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	45	59.2	71.4	71.4
	No value at all	8	10.5	12.7	84.1
	Provided some help	8	10.5	12.7	96.8
	Could not have done without	2	2.6	3.2	100.0
	Total	63	82.9	100.0	
Missing	system	13	17.1		
Total		76	100.0		

Table 22

Value of Other Resources

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	41	53.9	74.5	74.5
	No value at all	11	14.5	20.0	94.5
	Had a significant impact (made a difference)	1	1.3	1.8	96.4
	Could not have done without	2	2.6	3.6	100.0
	Total	55	72.4	100.0	
Missing	system	21	27.6		
Total		76	100.0		

Survey participants (n = 70) were asked if the insurance they had was enough to cover the cost of repairs due to Superstorm Sandy. Table 23 indicates that 78.6% of survey participants felt that the insurance they had prior to Superstorm Sandy was enough to cover their repair or reopening costs. 21.4% (n = 15) indicated that the insurance they had was not enough to cover the damage caused by Superstorm Sandy (Table 23). Survey participants (n = 13) indicated the reasons why they felt their insurance was insufficient (Table 24). Four survey participants indicated that when Superstorm Sandy made landfall, they did not have business insurance (Table 24). Five indicated that the insurance they had was not enough, and an additional four that the insurance they had was not the 'right' kind. Survey participants were asked to provide additional detail on these answers. Amplifying information provided by survey participants indicated the following: business insurance was not obtained due to cost of purchase, a separate rider

was needed to cover specific Superstorm Sandy damage (e.g., loss of business), the damage exceeded insurance coverage, and that there were limits on compensation for lost of food or wind-driven damage.

Table 23

Adequate Insurance

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	55	72.4	78.6	78.6
	No	15	19.7	21.4	100.0
	Total	70	92.1	100.0	
Missing	system	6	7.9		
Total		76	100.0		

Table 24

Insurance Gap Explanation

		Frequency	Percent	Valid percent	Cumulative percent
Valid	No business insurance	4	5.3	30.8	30.8
	Not enough business insurance	5	6.6	38.5	69.2
	Not the 'right' kind of insurance	4	5.3	30.8	100.0
	Total	13	17.1	100.0	
Missing	system	63	82.9		
Total		76	100.0		

Postdisaster resources were defined in this study as financial resources that are obtained after the disaster like loans, grants or gifts. While insurance payouts are technically received postdisaster, they are a result of predisaster planning efforts so they are included with the predisaster resources analysis. Childcare programs were asked to

identify which postdisaster resources they applied, and how valuable they assessed these postdisaster resources to be. Table 25 demonstrates the breakdown of postdisaster funding resources used by (n = 10) survey participants. The 20% of (n = 10) survey participants used some form of loan to cover Superstorm Sandy damages (Tables 25). 80% of those surveyed (n = 10) used grants of some type to defray repair or recovery costs (Table 25).

Table 25

Postdisaster Resources Used

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Loans from financial institutions	1	1.3	10.0	10.0
	Loans from SBA	1	1.3	10.0	20.0
	Grants from nonprofits	3	3.9	30.0	50.0
	Grants/Gifts from individuals	2	2.6	20.0	70.0
	State grants /funding	1	1.3	10.0	80.0
	Nonprofit & individual grants	1	1.3	10.0	90.0
	Federal (PA) & state grants	1	1.3	10.0	100.0
	Total	10	13.2	100.0	
Missing	system	66	86.8		
Total		76	100.0		

Survey participants were asked the perceived value of different postdisaster recovery resources. Table 26 indicates that the majority of (n = 65) survey participants, 86.2%, found either no value or no applicability for grants or gifts in their recovery efforts. 4.6.% of survey participants felt that they provided some help, 4.6% felt that they had a significant impact on their recovery or that it made a difference and 4.6% felt they could not have done without them (Table 26). Table 27 indicates that the greater majority

of (n = 61) survey participants, 96.7%, found either no value or no applicability for loans in their recovery efforts. One survey participant felt that they had a significant impact on their recovery or that it made a difference and one other survey participant felt they could not have done without loans in their recovery process (Table 27). Only one survey participant of (n = 59) who answered this question, felt there was value in other postdisaster resources (Table 28).

Table 26

Grant or Gift Value

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	44	57.9	67.7	67.7
	No value at all	12	15.8	18.5	86.2
	Provided some help	3	3.9	4.6	90.8
	Had a significant impact (made a difference)	3	3.9	4.6	95.4
	Could not have done without	3	3.9	4.6	100.0
	Total	65	85.5	100.0	
Missing	system	11	14.5		
Total		76	100.0		

Table 27

Loan Value

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	44	57.9	72.1	72.1
	No value at all	15	19.7	24.6	96.7
	Had a significant impact (made a difference)	1	1.3	1.6	98.4
	Could not have done without	1	1.3	1.6	100.0
	Total	61	80.3	100.0	
Missing	system	15	19.7		
Total		76	100.0		

Table 28

Value of Other Resources

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Not applicable	45	59.2	76.3	76.3
	No value at all	13	17.1	22.0	98.3
	Had a significant impact (made a difference)	1	1.3	1.7	100.0
	Total	59	77.6	100.0	
Missing	system	17	22.4		
Total		76	100.0		

Childcare providers were asked if they had applied for an SBA loan postdisaster. SBA loans are low interest loans that homeowners, renters, businesses, or nonprofits can apply for postdisaster. Only 4.5% of the survey participants (n = 67) indicated that they had applied for a loan from the SBA (Table 29). Of that same group (n = 67), only one of the three who had applied were approved and received the loan (Table 30). Survey participants were also asked why they had not applied for an SBA loan. 71.4% of (n = 63) survey participants selected the response other as an explanation for why they had not applied for an SBA loan. Analysis of the amplifying data left by (n = 44) text responses reflects that 43 of the 44 respondents felt they did not need an SBA loan. Only one respondent in this other category indicated that they had heard of SBA loans, but had not thought to apply for one (Table 31). 6.3% of survey participants (n = 63) indicated they did not know about SBA loans, 4.8% said they did not know how to apply for an SBA loan, and 17.5% said they had not applied because they thought they would not qualify for an SBA loan.

Table 29

Small Business Association Loan Application

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	3	3.9	4.5	4.5
	No	64	84.2	95.5	100.0
	Total	67	88.2	100.0	
Missing	system	9	11.8		
Total		76	100.0		

Table 30

Small Business Association Loan Approval

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Yes	1	1.3	1.5	1.5
	No	66	86.8	98.5	100.0
	Total	67	88.2	100.0	
Missing	system	9	11.8		
Total		76	100.0		

Table 31

Reasons Small Business Association Loan Not Applied For

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Didn't know about SBA Loans	4	5.3	6.3	6.3
	Didn't know how to apply	3	3.9	4.8	11.1
	Didn't think I would qualify	11	14.5	17.5	28.6
	Other	45	59.2	71.4	100.0
	Total	63	82.9	100.0	
Missing	system	13	17.1		
Total		76	100.0		

The intent of this study was to determine if application of RDT could help explain childcare recovery success or failure. Additionally, I wanted to determine what the relationship was (if any) between childcare type and recovery funding used in regards to postdisaster childcare program recovery time. Discussion of assumptions and analysis of each research question will be discussed in depth below.

Assumptions

In addition to descriptive analysis, two other analytical techniques were utilized for this study. A one-way analysis of variance (ANOVA) was conducted for research questions one, two, and three. A factorial analysis of variance was conducted for research question four. Analytic assumptions and results for these research questions will be discussed below.

There are three assumptions for one-way ANOVA. The first assumption is that the dependent variable is distributed normally across each of the levels or populations (Green & Salkind, 2014). Homogeneity of variance is the second assumption of ANOVA (Field, 2013). Finally, the third assumption is that the cases are random samples of each population group and the values of the test variables are independent of each other (Green & Salkind, 2014). The third assumption for a one-way ANOVA as met through researcher protocols and data collection. Tests for normality were conducted for the dependent variable for each research question with the independent variable relevant to each question included as a factor in the analysis. Table 32 tested normality for research question one and the Shapiro-Wilk test resulted in $p < 0.05$, indicating the assumption of normality was not met. Table 33 tested normality for research question two and the

Shapiro-Wilk test resulted in $p < 0.05$, indicating the assumption of normality was not met. Table 34 tested normality for research question three and the Shapiro-Wilk test also resulted in $p < 0.05$, indicating the assumption of normality was not met. Homogeneity of variance can be met through Levene's test, the Brown-Forsythe test or the Welch test and the results are provided under the appropriate research question section (Frankfort-Nachmias et al., 2015).

Table 32

Normality Tests for Research Question 1

	Resource funding used	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Recovery time	predisaster	.278	22	.000	.650	22	.000
	postdisaster	.414	4	.	.670	4	.005
	Combination	.469	6	.000	.539	6	.000

a. Lilliefors Significance Correction

Table 33

Normality Tests for Research Question 2

	Childcare Type	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Recovery time	Residential / Family Child Care	.363	18	.000	.629	18	.000
	Nonresidential / Center Based	.442	52	.000	.284	52	.000

a. Lilliefors Significance Correction

Table 34

Normality Tests for Research Question 3

	Number of recovery resources	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Recovery time	1 resource	.344	18	.000	.418	18	.000
	2 resources	.382	11	.000	.613	11	.000
	3 resources	.372	3	.	.780	3	.069

a. Lilliefors Significance Correction

The same assumptions for one-way ANOVA apply to factorial ANOVA. The first assumption is that the dependent variable is distributed normally across each of the levels or populations (Green & Salkind, 2014). Homogeneity of variance is the second assumption of ANOVA (Field, 2013). Finally, the third assumption for factorial ANOVA is that the cases analyzed are random samples of each population group and the values of the test variables are independent of each other (Green & Salkind, 2014). The third assumption for a one-way ANOVA is the same as for a factorial ANOVA and was again met through researcher protocols and data collection. Test for normality were conducted in SPSS using the Explore / Split File commands. The results indicate that the assumption of normality was not met for any group with the exception of nonresidential childcare programs that used post disaster recovery funding (Table 35). The Kolmogorov-Smirnov test indicates $p = 0.125$, and the Shapiro-Wilk test indicated $p = 0.106$, validating the assumption of normalcy for this group. Homogeneity of variance can be met through Levene's test, the Brown-Forsythe test or the Welch test and the results are provided under the section pertaining to research question four (Frankfort-Nachmias et al., 2015).

Table 35

Normality Tests for Research Question 4

Tests of Normality[a]

	Kolmogorov-Smirnov[b]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Recovery time	.273	7	.125	.843	7	.106

a. Recovery Category Number = 2, Childcare Type = Nonresidential / Center Based
b. Lilliefors Significance Correction

Research Question 1

Research Question 1 asked: What, if any, is the difference in recovery time when multiple forms of recovery funding were used? Two variables were selected for this one-way analysis of variance (ANOVA). The independent variable analyzed was recovery funding used. Recovery funding used was a nominal variable and included three funding attributes: use of predisaster resources, use of postdisaster resources, or use of a combination of both pre- and postdisaster resources. The dependent variable for this study was recovery time and was measured in days (whole integer values). Recovery time was a continuous variable. Table 36 shows the descriptive statistics for the independent variable of recovery funding. The survey participants who utilized predisaster recovery funding resources comprised 22 cases, with a mean of 10.18, (*SD* = 13.121). The survey participants who utilized postdisaster recovery funding resources comprised 4 cases, with a mean of 44.75, (*SD* = 70.268). The survey participants who utilized both types of recovery resources (pre- and postdisaster) comprised 6 cases, with a mean of 48.33, (*SD*

= 98.919). Analysis of this descriptive table indicates higher standards of deviation for postdisaster recovery resources and use of both forms of recovery resources than for predisaster recovery resources, indicating a greater diversity or variance of recovery times across these categories.

As shown in Table 36, the confidence interval (CI) at 95% for survey respondents using postdisaster recovery funding = (-67.06, 156.56). This indicates that the mean recovery time for survey respondents using postdisaster funding was most likely between 0 to 156.56 days. Similarly, the 95% CI for survey respondents using predisaster recovery funding = (4.36, 16.00) and indicates a mean recovery time for these respondents of between 4 and 16 days. Because these two confidence intervals overlap, we cannot reject the hypothesis that use of predisaster recovery funding has the same impact on recovery time as use of postdisaster recovery funding. The 95% CI for use of both pre- and postdisaster recovery funding = (-55.487, 152.14) overlaps with the both the pre- and postdisaster the CI, resulting in a failure to reject the hypotheses that the type of recovery funding resources used affects recovery time.

A one-way analysis of variance was conducted to compare the recovery time reported by respondents who utilized predisaster, postdisaster or both sources of recovery funding and the results of that ANOVA are depicted in Table 37. There was not a significant effect of recovery funding used on recovery time reported at the 95% confidence level for the three conditions, F (2, 29) = 2.002, p = 0.153. Because $p > 0.05$, the null hypothesis that there is no difference in recovery time when multiple forms of recovery funding are used cannot be rejected.

Homogeneity of variance was tested and the results are in Table 38. The Brown-Forsythe test confirmed the assumption of homogeneity of variance with $p = 0.501$. The Welch test, also in Table 38, also confirms this assumption with $p = 0.494$.

Table 36

Independent Variable Recovery Funding Descriptives

						95% Confidence Interval for Mean	
		N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound
predisaster		22	10.18	13.121	2.797	4.36	16.00
postdisaster		4	44.75	70.268	35.134	-67.06	156.56
Combination		6	48.33	98.919	40.384	-55.48	152.14
Total		32	21.66	49.726	8.790	3.73	39.58
Model	Fixed effects			48.193	8.519	4.23	39.08
	Random effects				15.243	-43.93	87.24

		Minimum	Maximum	Between-Component Variance
predisaster		0	60	
postdisaster		7	150	
Combination		3	250	
Total		0	250	
Model	Fixed effects			
	Random effects			305.233

Table 37

One-Way ANOVA for Research Question 1

	Sum of Squares	df	Mean Square	F	Sig.
Between groups	9299.863	2	4649.931	2.002	.153
Within groups	67353.356	29	2322.530		
Total	76653.219	31			

Table 38

Robust Test for Equality of Means for Research Question 1

	Statistic[a]	df1	df2	Sig.
Welch	.813	2	5.057	.494
Brown-Forsythe	.755	2	8.052	.501

Research Question 2

Research Question 2 asked: What, if any, is the difference in recovery time based on childcare type? Two variables were selected for this one-way analysis of variance (ANOVA). The independent variable analyzed for this research question was childcare type. Childcare type was a nominal variable and included two attributes: residential or nonresidential childcare programs. The dependent variable for this study was again recovery time.

Table 39 shows the descriptive statistics for the independent variable of childcare type. The survey participants who were directors or owners of residential childcare programs comprised 18 cases, with a mean of 10.11, (*SD* = 14.467). The survey participants who directed or owned nonresidential childcare programs comprised 52 cases, with a mean of 13.10, (*SD* = 39.279). Analysis of this descriptive table indicates

similar standards of deviation for both childcare types, indicating a smaller diversity or variance of recovery times across these categories. As shown in Table 39, the confidence interval (CI) at 95% for residential childcare = (2.92, 17.31). This indicates that the mean recovery time for residential programs surveyed was most likely between 2 to 17 days. Similarly, the 95% CI for survey respondents of nonresidential childcare programs = (2.16, 24.03). and indicates a mean recovery time for nonresidential childcare program respondents between 2 and 24 days. Because these two confidence intervals overlap, we cannot reject the null hypothesis that there is no difference in recovery time based on childcare type.

A one-way analysis of variance was conducted to compare the recovery time reported by residential childcare program and nonresidential childcare program survey respondents. The results of that ANOVA are depicted in Table 40. There was not a significant effect of childcare type that impacted childcare program recovery time reported at the 95% confidence level for the one condition, F (1, 68) = 0.099, p = 0.755. Because $p > 0.05$, the null hypothesis that there is no difference in recovery time based on childcare type cannot be rejected.

Homogeneity of variance was tested and the results are in Table 41. The Brown-Forsythe and Welch test both confirmed the assumption of homogeneity of variance with p = 0.644, which is greater than 0.05 (Frankfort-Nachmias et al., 2015).

Table 39

Independent Variable Childcare Type Descriptives

						95% Confidence interval for mean
		N	Mean	Std. deviation	Std. error	Lower bound
Residential/Family child care		18	10.11	14.467	3.410	2.92
Nonresidential/Center based		52	13.10	39.279	5.447	2.16
Total		70	12.33	34.550	4.129	4.09
Model	Fixed effects			34.778	4.157	4.03
	Random effects				4.157[a]	-40.49[a]

Recovery Time

		95% Confidence Interval for Mean			Between-Component
		Upper bound	Minimum	Maximum	variance
Residential/Family child care		17.31	0	60	
Nonresidential/Center based		24.03	0	250	
Total		20.57	0	250	
Model	Fixed effects	20.62			
	Random effects	65.14[a]			-40.771

a. Warning: Between-component variance is negative. It was replaced by 0.0 in computing this random effects measure.

Table 40

One-Way ANOVA for Research Question 2

	Sum of squares	df	Mean square	F	Sig.
Between groups	119.146	1	119.146	.099	.755
Within groups	82244.297	68	1209.475		
Total	82363.443	69			

Table 41

Robust Test for Equality of Means for Research Question 2

	Statistic[a]	df1	df2	Sig.
Welch	.216	1	67.641	.644
Brown-Forsythe	.216	1	67.641	.644

a. Asymptotically F distributed.

One-way ANOVA analyses were also conducted to compare the effect of other childcare characteristics on recovery time. Tests were conducted for whether the childcare program location was leased/rented or owned by the childcare program, how the childcare program was funded (nonprofit, forprofit, etc.,) and whether or not the childcare program was part of a franchise or corporation. None of these analyses resulted in significant effect determinations upon recovery time. Childcare program location ownership, leased/rented status or other status (located in a church or school) had no significant effect on childcare program recovery time reported at the 95% confidence level for the four conditions, F (4, 65) = 1.587, p = 0.188 (Table 42). Childcare program funding type (forprofit, nonprofit, mixed funding) had no significant effect on childcare program recovery time reported at the 95% confidence level for the three conditions, F (3, 66) = 0.056, p = 0.982 (Table 43). Childcare program status as a part of a childcare corporation or franchise had no significant effect on childcare program recovery time reported at the 95% confidence level for one condition, F (1, 68) = 0.694, p = 0.408 (Table 44).

Table 42

One-Way ANOVA for Location Status Versus Recovery Time

	Sum of squares	df	Mean square	F	Sig.
Between groups	7328.022	4	1832.005	1.587	.188
Within groups	75035.421	65	1154.391		
Total	82363.443	69			

Table 43

One-Way ANOVA for Funding Status Versus Recovery Time

	Sum of squares	df	Mean square	F	Sig.
Between groups	208.714	3	69.571	.056	.982
Within groups	82154.729	66	1244.769		
Total	82363.443	69			

Table 44

One-Way ANOVA for Corporate/Franchise Status Versus Recovery Time

	Sum of Squares	df	Mean square	F	Sig.
Between groups	831.814	1	831.814	.694	.408
Within groups	81531.629	68	1198.995		
Total	82363.443	69			

Research Question 3

Research Question 3 asked: What, if any, is the difference in recovery time based on the number of childcare recovery funding types used? Two variables were selected for this one-way analysis of variance (ANOVA). The independent variable analyzed for this research question was the number of categories of recovery funding used. Survey participants (n = 32) reported using between one and three types of recovery funding. Recovery category numbers was an ordinal variable and included three attributes: one, two, or three forms of recovery funding (based on survey responses received). The dependent variable for this study was again recovery time.

Table 45 shows the descriptive statistics for the independent variable of recovery category numbers. The survey participants who used one form of recovery funding comprised 18 cases, with a mean of 15.72, (SD = 34.308). The survey participants who used two categories of recovery funding comprised 11 cases, with a mean of 12.91, (SD = 16.300). The survey participants who used three categories of recovery funding comprised three cases, with a mean of 89.33, (SD = 139.231). Analysis of this descriptive table indicates similar standards of deviation for childcare programs that used one or two recovery resources compared to those who used three types of recovery funding categories, indicating a smaller diversity or variance of recovery times across those two categories.

A one-way analysis of variance compared the recovery time reported to the number of recovery resources used. The results of that ANOVA are depicted in Table 46. There was a statistically significant effect of recovery category numbers that impacted

childcare program recovery time reported at the 95% confidence level for the three conditions, F (2, 29) = 3.591, p = .040. Because p is less than .05, the null hypothesis can be rejected and the alternative hypothesis that there is a difference in recovery time based on the number of categories of childcare recovery funding used can be accepted. Effect size can be determined by calculating Eta squared (η^2) from the treatment of sum of squares and total sum of squares values in Table 46. From this η^2 = .199, which is defined as a small effect and indicates that 19.9% of the variance in recovery time is due to the number of recovery funding categories used.

Homogeneity of variance was tested and the results are in Table 47. The Brown-Forsythe test indicted p = 0.539 and the Welch test indicated p = 0.672, both confirming the assumption of homogeneity of variance with $p > 0.05$ (Frankfort-Nachmias et al., 2015).

Table 45

Independent Variable Recovery Category Numbers Descriptives

					95% Confidence interval for mean	
		N	Mean	Std. deviation	Std. error	Lower bound	Upper bound
1 resource		18	15.72	34.308	8.086	-1.34	32.78
2 resources		11	12.91	16.300	4.915	1.96	23.86
3 resources		3	89.33	139.231	80.385	-256.54	435.20
Total		32	21.66	49.726	8.790	3.73	39.58
Model	Fixed effects			46.027	8.137	5.02	38.30
	Random effects				18.425	-57.62	100.93

				Between- Component Variance
		Minimum	Maximum	
1 resource		0	150	
2 resources		1	60	
3 resources		4	250	
Total		0	250	
Model	Fixed effects			
	Random effects			616.364

Table 46

One-Way ANOVA for Research Question 3

	Sum of squares	df	Mean square	F	Sig.
Between groups	15216.032	2	7608.016	3.591	.040
Within groups	61437.187	29	2118.524		
Total	76653.219	31			

Table 47

Robust Test for Equality of Means for Research Question 3

	Statistic[a]	df1	df2	Sig.
Welch	.429	2	4.974	.673
Brown-Forsythe	.833	2	2.160	.539

a. Asymptotically F distributed.

Research Question 4

Research Question 4 asked: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy? To analyze the fourth hypothesis, a factorial analysis of variance (ANOVA) was used to assess how childcare type and recovery funding used interacted to predict recovery time. Two independent variables were selected for this factorial analysis of variance (ANOVA). The independent variables analyzed for this research question were the type of recovery funding used and childcare type. Childcare type was a nominal variable and included two attributes: residential or nonresidential childcare programs. Recovery funding used was a nominal variable and included three funding attributes: use of predisaster resources, use of postdisaster resources, or use of a combination of both pre- and postdisaster resources. The dependent variable for this study was again recovery time.

Table 48 shows the descriptive statistics for the independent variables of recovery funding used and childcare type. The residential childcare program survey participants who used predisaster recovery funding comprised five cases, postdisaster funding

comprised four cases, and both funding sources comprised one case (Table 48). The nonresidential childcare program survey participants who used predisaster recovery funding comprised 13 cases, postdisaster funding comprised seven cases, and both funding sources comprised two cases (Table 48).

A factorial analysis of variance was conducted to compare the recovery time reported to the interaction effect of childcare type and recovery funding used. The results of that factorial ANOVA are depicted in Table 49. An interaction between childcare type and recovery funding used could not be demonstrated, F (2,26) = 2.806, p = 0.079 (Table 49). Because $p > 0.05$, the null hypothesis could not be rejected. The results in Table 49 also indicated that there was no statistically significant effect of either childcare type or recovery funding used on recovery time. The partial eta squared (η_p^2) for this interaction was also negligible at 0.178 and the adjusted R^2 value indicates that only 22.1% of the variance in recovery time could be attributed to childcare type and recovery funding used (Table 49). Bonferroni Post Hoc tests were conducted to determine which recovery funding groups were significantly different in recovery time. Results in Table 50 indicate that there was no significant difference for those who used predisaster or postdisaster recovery funding on recovery time. Results revealed that the recovery time of those who used both pre- and postdisaster funding was significantly different than those who used either pre- or postdisaster funding only (Table 50).

Homogeneity of variance was tested and the results are in Table 51. Levene's Test revealed p = 0.001 based on the median (Table 51). Since $p < 0.05$, the assumption of homogeneity could not be confirmed (Frankfort-Nachmias et al., 2015).

Table 48

Descriptive Statistics for Research Question 4

Dependent variable:	Recovery time			
Childcare type	Recovery funding used	Mean	Std. deviation	N
Residential/Family child Care	Predisaster	14.20	10.474	5
	Postdisaster	21.00	26.166	4
	Both	4.00	.	1
	Total	15.90	17.489	10
Nonresidential/ Center based	Predisaster	16.31	40.368	13
	Postdisaster	8.29	5.648	7
	Both	132.00	166.877	2
	Total	24.27	59.128	22
Total	Predisaster	15.72	34.308	18
	Postdisaster	12.91	16.300	11
	Both	89.33	139.231	3
	Total	21.66	49.726	32

Table 49

Factorial ANOVA Results for Research Question 4

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Corrected model	26566.221[a]	5	5313.244	2.758	.040	.347
Intercept	17667.715	1	17667.715	9.171	.005	.261
Childcare type	6351.432	1	6351.432	3.297	.081	.113
Recovery funding used	6760.704	2	3380.352	1.755	.193	.119
Childcare type * recovery Funding used	10812.316	2	5406.158	2.806	.079	.178
Error	50086.998	26	1926.423			
Total	91661.000	32				
Corrected total	76653.219	31				

a. R Squared = .347 (Adjusted R Squared = .221)

Table 50

Post Hoc Tests for Research Question 4

Multiple comparisons

Dependent variable: Recovery Time

	(I) Recovery funding used	(J) Recovery funding used	Mean difference (I-J)	Std. error	Sig.
Bonferroni	Predisaster	Postdisaster	2.81	16.797	1.000
		Both	-73.61*	27.371	.037
	Postdisaster	Predisaster	-2.81	16.797	1.000
		Both	-76.42*	28.588	.038
	Both	Predisaster	73.61*	27.371	.037
		Postdisaster	76.42*	28.588	.038

	(I) Recovery funding used	(J) Recovery funding used	95% confidence interval	
			Lower bound	Upper bound
Bonferroni	Predisaster	Postdisaster	-40.17	45.80
		Both	-143.65	-3.57
	Postdisaster	Predisaster	-45.80	40.17
		Both	-149.58	-3.27
	Both	Predisaster	3.57	143.65
		Postdisaster	3.27	149.58

Based on observed means.

The error term is Mean Square (Error) = 1926.423.

*. The mean difference is significant at the

Table 51

Levene's Test for Equality for Research Question 4

		Levene statistic	df1	df2	Sig.
Recovery time	Based on mean	9.480	4	26	.000
	Based on median	6.874	4	26	.001
	Based on median and with adjusted df	6.874	4	14.454	.003
	Based on trimmed mean	8.018	4	26	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.[a,b]

a. Dependent variable: Recovery Time

b. Design: Intercept + Childcare Type + Recovery Funding Used + Childcare Type * Recovery Funding Used

Summary

Chapter 4 included a detailed explanation of the data collection processes, recruitment, timelines and response rates. Detailed descriptive data analysis and results for one-way ANOVAs and a factorial ANOVA were presented for this quantitative study. The intent of this research was to determine if childcare type or recovery funding used (or any combination of factors therein) impacted recovery time of childcare programs affected by Superstorm Sandy.

Four research questions were analyzed and a variety of descriptive data from the survey questions was presented. The first research question asked: what if any, is the difference in recovery time when multiple forms of recovery funding are used? A one-way ANOVA indicated that use of a specific type of recovery funding (predisaster, postdisaster, or both types) did not result in a statistically significant effect on recovery

time. The second research question asked: What, if any, is the difference in recovery time based on childcare type? A one-way ANOVA indicated that childcare type did not result in a statistically significant effect on recovery time. The third research question asked: What, if any, are the differences in recovery time based on the number of categories of childcare recovery funding used? A one-way ANOVA indicated that the number of recovery funding resources (one, two or three) resulted in a statistically significant effect on recovery time. The fourth research question asked: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy? A factorial ANOVA indicated that childcare type and recovery funding used did not allow for prediction of recovery time.

Chapter 5 addresses the interpretation of the research findings, a discussion of study limitations, future recommendations and the implications for social change.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this quasi-experimental quantitative study was to examine how childcare program recovery time varied as a result of childcare type and recovery funding used. I used a causal-comparative quasi-experimental model to explain the consequences of one or more independent variables on the dependent variable (see Fraenkel, 2006; Frankfort-Nachmias et al., 2015; Wayne & Boissoneau, 1996). This study focused specifically on childcare programs impacted by Superstorm Sandy in New York, New Jersey, and Connecticut. Research on childcare recovery is important because of the role childcare plays in the recovery of both children and the community postdisaster (Kinsel & Thomasgard, 2008). Without adequate and safe childcare, parents cannot meet work obligations, and with higher parent absenteeism postdisaster due to childcare recovery issues, businesses and community recovery will also be affected. This chapter includes my interpretations of the research findings, study limitations, recommendations for future research, and a discussion on the social implications based on these findings.

Based on the results of this study, this chapter provides conclusions related to four research questions.

RQ1: What if any, is the difference in recovery time when multiple forms of recovery funding are used?

RQ2: What, if any, is the difference in recovery time based on childcare type?

RQ3: What, if any, are the differences in recovery time based on the number of categories of childcare recovery funding used?

RQ4: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy?

While only one of these research questions, RQ3, resulted in statistically significant results, the data produced from one-way and factorial ANOVA analysis as well as descriptive data analysis did provide academic value and helped fill the literature gap on childcare and disaster recovery.

Interpretation of Findings

The aim of this study was to test whether RDT could help explain childcare program recovery success postdisaster. Additionally, in this study I also attempted to determine whether there was a relationship between childcare type and recovery funding or if either (individually, or in combination) impacted childcare program recovery time postdisaster.

Research Question 1

Research Question 1 asked: What, if any, is the difference in recovery time when multiple forms of recovery funding are used? My findings indicated that there was no statistically significant effect on recovery time when multiple forms of recovery funding (predisaster, postdisaster, and a combination of both) were used. Predisaster recovery funding was defined as insurance and savings. Postdisaster recovery funding was defined as loans and grants. While a significant effect was not noted and the null hypothesis could not be rejected, survey participants who utilized predisaster recovery funds ($n = 22$) reported a recovery time between 4-16 days. Survey participants who utilized postdisaster recovery funds ($n = 4$) and a combination of both ($n = 6$) indicated recovery times of 0-

156 days and 0-152 days respectively. The assumption of normality was not met for this research question, but the assumption of homogeneity of variance was met. Although the normality assumption for an ANOVA was not met failure to meet this assumption does not necessarily invalidate results (Field, 2013).

RDT was developed by Pfeffer and Salancik (1978) and remains one of the most recognized theories in use to explain how the environment affects an organization and its survival (Hillman et al., 2009; Pfeffer & Salancik, 2016; Ulrich & Barney, 1984). RDT defines organizations that can control or limit resource dependencies through a variety of techniques as effective (Pfeffer & Salancik, 1978; Pfeffer & Salancik, 2016). This study was designed to look at survival, or recovery, of childcare programs postdisaster. This study was designed to assess the effectiveness of childcare programs in recovery through examination of what types of recovery resources childcare programs used to recover. Despite an inability to confirm the RDT tenant that diversification of recovery resources enabled quicker childcare program recovery time postdisaster, this finding does provide interesting options for further study. For example, RDT postulates that diversification of resources enables organizational survival (Pfeffer & Salancik, 1978; Pfeffer & Salancik, 2016). Future research might help validate whether it is diversification of resources or a combination of predisaster resources that enable quicker recovery when supplemented by postdisaster resources, rather than relying on postdisaster resources alone.

Research Question 2

Research Question 2 asked: What, if any, is the difference in recovery time based on childcare type? My findings indicated that there was no statistically significant effect

on recovery time based on childcare type. Childcare type consisted of two groups, residential and nonresidential childcare. The survey results indicated that both childcare types, residential and nonresidential, had overlapping recovery times. The mean recovery time for residential childcare programs surveyed was between 2 to 17 days, and between 2 to 24 days for nonresidential childcare programs. Childcare type alone did not account for a significant factor in predicting recovery time. Like Research Question 1, the assumption of normality was not met for this research question, but the assumption of homogeneity of variance was.

In addition to assessing the impact of childcare type on recovery time, I conducted separate one-way ANOVAs to determine if some other identified factor influenced recovery time. The following factors were analyzed as independent variables:

- Childcare location status (leased versus owned)
- Childcare funding (nonprofit, forprofit, multiple funding sources)
- Childcare as a franchise or part of a corporation

No statistically significant results were discovered. This research question was designed to determine if some other characteristic not related to resources impacted recovery time. While this could not be determined, the small sample size cannot rule out the existence of some as yet unidentified factor that could have influenced recovery time.

Research Question 3

Research Question 3 asked: What, if any, is the differences in recovery time based on the number of categories of childcare recovery funding used? My findings indicated that there was a statistically significant effect on recovery time based on the number of

categories of childcare recovery funding used. Analysis of this research question indicated that the number of recovery funding categories used did have a statistically significant result, $p = .040$, on recovery time. Like Research Questions 1 and 2, the assumption of normality was again not met for this research question, but the assumption of homogeneity of variance was.

This research question again looked at whether diversification, a tenet of RDT, could enable quicker childcare program recovery time postdisaster (see Pfeffer & Salancik, 1978, 2016). Specifically, with Research Question 3 I tried to determine if use of a greater number of recovery funding categories resulted in a quicker recovery time. RDT has also been undertaken through the utilization of insourcing or diversification of resources. Diversification of resources is another mitigation strategy designed to limit over dependence on a single resource or market through the attainment of alternate resources and creation or attainment of these alternate resources (Nienhüser, 2008; Sheppard, 1995). In the context of this study, I defined diversification as an RDT strategy that used of a greater number or types of recovery funding categories. The sample size for this question was small ($n = 32$), but the presence of a statistically significant effect on recovery time based on the number of recovery resources used does provide evidence that helps validate this theory's application to childcare recovery postdisaster.

Research Question 4

Research Question 4 asked: To what extent, if any, does childcare type and recovery funding used predict recovery time with respect to Superstorm Sandy? My findings indicated that childcare type and recovery funding used cannot be determined to

predict recovery time with respect to Superstorm Sandy. I conducted tests for normality and homogeneity of variance. Unlike the previous three questions, the assumption of homogeneity of variance was not met for Research Question 4. Interestingly, the assumption of normality was not met for residential childcare programs that used any of the three recovery funding sources (predisaster, postdisaster, or a combination of the two). The assumption of normality was, however, met for nonresidential childcare programs that utilized postdisaster recovery funding only.

Initially, I had assumed that certain types of childcare would have greater access to additional recovery funding resources and this would have resulted in diverse recovery results. This assumption was not confirmed. The research study sample size was much lower than desired, and this limitation may have impacted results. The significance value from this factorial ANOVA was slightly greater than 0.05 ($p = .079$), meaning that the null hypothesis that childcare type and recovery funding used does not predict recovery length with regards to Superstorm Sandy. However, post hoc tests revealed some interesting results. There was a difference between childcare programs that utilized both types of recovery funding, predisaster, ($p = .037$) and postdisaster ($p = .038$) over utilization of just one source. These results are especially interesting as the results of the one-way ANOVA conducted for Research Question 1 indicate that there was no statistically significant result for use of specific recovery funding (predisaster, postdisaster, or both) independent of childcare type. This difference suggests that more research is needed to help explain this discrepancy.

Additional Findings

In addition to helping bound research questions, descriptive data analysis of survey responses provided interesting demographic insight into survey participants and attitudes towards recovery funding use and applicability in regard to Superstorm Sandy. It was interesting to note that only 36.8% of the survey participants indicated that their childcare program had sustained damage and that the surveyed childcare programs experienced a mean value of 12.33 days of closure due to Superstorm Sandy (Table 12; Table 11). Additionally, survey results indicated that 73.7% of survey respondents reported having incurred damage of $4,999 or less (Table 13). To obtain better fidelity, the survey question related to damage should be rewritten to provide a response option for no damage rather than a single category that included 0-$4,999 in damage. The childcare programs that sustained more significant damage appear to skew the results, but this is most likely a result of the small sample size.

Questions on value of various pre- and postdisaster recovery funding resources were asked. Again, the results indicate that there is a potential need for survey refinement. It appears that there was confusion between the choices of commercial insurance and business property insurance. Additionally, when asked to provide detail on other resources used, grants provided by nonprofits or funding support from churches were listed as predisaster rather than postdisaster recovery funding, also indicating confusion and a need for better wording on future surveys.

While not a research question, data was also collected on SBA loans and whether this postdisaster resource option was utilized for childcare program recovery. Only 4.5%

of survey participants indicated that they had applied for SBA loans (Table 29). This is an extremely small number, and when considering the low damage amounts provided by the majority of survey participants, this could make sense. However, since 28.6% of survey respondents indicated that they had not applied for SBA loans because they either did not know about them, did not know how to apply, or did not think they would qualify, it could indicate a gap in childcare program understanding of postdisaster recovery resources available to them (Table 31).

Also assessed, but not related to the aforementioned research questions, was survey participant perceptions about the adequacy of the insurance they had in relation to their childcare program recovery experience. The majority of survey participants, 78.6%, indicated they felt their insurance was adequate, but 13 of the 15 respondents indicated that they felt there was a gap between what they felt they needed for their recovery needs and what they had. There was an almost even split between respondents on what they felt was the gap: no business insurance, not enough business insurance, or not the 'right' kind of business insurance (Table 24). Given the potential value of predisaster recovery resources determined by the results of Research Question 1, further research into how to lower these 'gap' numbers could be merited.

This study attempted to determine if RDT could explain childcare recovery. The survey results were unable to confirm or negate its applicability. However, this study provided important insight into the previously undocumented experience of childcare program recovery. A thorough literature review indicated a gap in knowledge existed for

studies providing data on childcare recovery experiences. This study helps fill that gap and provides a groundwork to build off of for future childcare recovery studies.

Limitations of the Study

There were study limitations that must be considered when evaluating the results and conclusions of this research. The first limitation was related to periodicity, or how much time had passed since the event of interest. The second limitation was an inability to target Superstorm Sandy affected childcare programs directly. The third limitation was a low participant response rate and survey timing cycle. Fourth, it was assumed that counties with disaster declarations due to Superstorm Sandy had affected childcare programs within these specified counties. Fifth, I developed the survey instrument, so validity had to be proven. Finally, generalizability had be considered as a potential limitation.

First, as mentioned in Chapter 1, a significant amount of time had passed since this event occurred in 2012. Because of this time lapse, survey participants may have no longer been accessible or have access to information requested in the survey. For example, childcare programs that might have closed since 2012 either due to Superstorm Sandy, or for another reason, would not have been accessible on current childcare program databases. Additionally, the existence of these missing programs would not have even be apparent.

Second, arising from this first time lapse limitation, and identified in Chapter 4, there was an inability to identify and specifically childcare programs affected by Superstorm Sandy for survey participation. State licensing agencies were unwilling to

forward out survey invitations to their registered childcare. Additionally, some childcare programs, like residential childcare in New Jersey, were not required to register with the state, so an active database to draw from was not available. For most states, lists of nonresidential childcare programs could be found in public databases and letters could be sent to childcare programs listed. Childcare program public databases had to be analyzed in detail to find childcare programs that had been in operation since at least 2011 to be included in the list for random stratification invitation selection.

Third, the participant number and response rate for this research was extremely low. Only 114 childcare programs participated in this survey, and of these only 76 were included in the final number. This number was significantly below the desired sample size of 137 valid participants. The response rate was under 8%, which was also problematic. Part of this problem can be attributed to the aforementioned limitation in targeting selection, but there were also contributing factors. First, none of the open source childcare program databases provided e-mail contact information, which made data collection more costly and potentially impacted response rates with a limited means of reminder notification options available. Finally, the timing of the study was potentially problematic as it covered several holidays and typical stand down or vacation periods (i.e., Thanksgiving, Christmas, and New Year's Eve).

Fourth, there was an assumption that childcare programs located in areas of New York, New Jersey, and Connecticut that had been declared disaster areas due to Superstorm Sandy would have been likely to have sustained damage and would have been good candidates for survey recruitment. Discussions with childcare resource and

referral organizations in some of these affected areas indicated that while some counties had been declared disasters, the childcare community in that area really had not experienced a problem.

Fifth, in Chapter 1, the measuring instrument was identified as a significant limitation. A questionnaire was developed for this study, and the potential for bias in wording, or ambiguity of interpretation could not be ruled out. However, this was mitigated through consultation with multiple subject matter experts in the childcare community to help address validity concerns.

Finally, generalizability or representativeness must be addressed. The population surveyed were childcare program owners or directors in three different states who experienced a hurricane. While there were childcare programs in all three states that participated, survey numbers were low so questions of generalizability may still be applicable. The designation of the childcare program rather than an individual as the unit of measurement helped mitigate this limitation.

Recommendations

The purpose of this study was to research how childcare type and recovery funding used impacted childcare program recovery in respect to Superstorm Sandy. The analysis of data in this study did not result in many statistically significant results, but many of the results were values not far from significance ($p < .05$). Because the study did not meet desired sample sizes, I believe that further research is needed to help validate the theoretical framework and research questions. This study focused on Superstorm Sandy, the largest natural disaster to have impacted childcare programs at the time of my

doctoral studies program start. Since then, there have been numerous other disasters that have had a large geographical scope (e.g., Hurricane Matthew, Hurricane Hugo, Hurricane Irma and Hurricane Maria). I believe there would be enormous value in comparing the results of childcare programs who experienced these disasters in the same survey context. If larger sample sizes could be obtained, the results would provide potentially greater significance values or at least more robust assumption invalidation.

The survey itself also needs modification. The use of subject matter experts helped translate much of the contents to a format more helpful to childcare programs, however, there is room for improvement. First, a separate category of no damage rather than a category of $0-$5000 in damage is needed to help better qualify this category. Additionally, more clarification is needed for predisaster and postdisaster categories and 'other' options. The way the survey was worded resulted in some participants adding in information under the wrong section. This modification can be completed quickly and will add better result fidelity. I also recommend greater research into why SBA loans are not being sought be impacted childcare programs.

Implications

Childcare is a vital part of a community. Identification and analysis of childcare recovery stumbling blocks or best practices can improve childcare recovery postdisaster. This study is first of its kind to provide quantitative data on childcare recovery and how childcare type or the type and number of recovery funding resources used impacts childcare recovery time. A thorough review of the literature indicated that the return of

normalcy and routine is a key component in the recovery of children postdisaster and that it also helps parents start the recovery rebuilding process (Masten & Narayan, 2012).

The first step in process improvement is understanding of the process. Analysis of the data provided by this research could help improve community recovery rates and thereby enable positive social change postdisaster. Childcare recovery rate improvement helps children, parents, the childcare industry, as well as other industries in the community recover faster. Childcare is not only important to parents, it is an economic enabler post as an industry itself (Murrin, 2015; Warner, 2006, 2007; Wizemann et al., 2014). After a disaster, if parents cannot go to work because of a lack of childcare, community recovery will be affected (Bullock et al., 2011; Warner, 2006).

Childcare provides part of the daily critical child infrastructure children depend upon during normal circumstances as well as postdisaster (Bullock et al., 2011). Ensuring that children have the resources they need to recover helps enable an already vulnerable population (Bullock et al., 2011; Peek et al., 2008). Enabling childcare recovery also enables community recovery by allowing parents to get on with the task of rebuilding their lives and returning to work (Bullock et al., 2011; Wizemann et al., 2014). Social change starts with information. This study helps provide the first step in a long path to improving the resilience of the critical infrastructure children depend on not just in sunny weather, but during the most challenging times of their lives, when they and their families are impacted by disaster.

Significance to Theory and Practice

RDT traditionally was applied to corporate analysis and it focused on explaining corporate engagement in ventures or mergers as a behavior meant to alter resource dependencies (Davis & Cobb, 2010; Hillman, Withers, & Collins, 2009). Application of RDT in this study allowed the opportunity to test RDT relevance in a greater "survival" context, i.e., recovery from disaster. RDT assumes that organizations, when faced with resource dependencies and increased uncertainty, will seek to control or mitigate those resources (Pfeffer & Salancik, 1978; Pfeffer & Salancik, 2016; Ulrich & Barney, 1984). This study attempted to provide insight into whether or not childcare programs who attempted to mitigate resource limitations through predisaster resource accrual or through recovery funding diversification fared better in postdisaster recovery times than those who did not. The study results indicated that while there was not a statistically significant result for childcare programs that utilized predisaster versus postdisaster resources (or a combination), there were interesting differences. The study also indicated that the number of resources used played a slightly significant factor in recovery time. These results did not invalidate the extended application of RDT to childcare recovery, but instead posed the requirement for additional research to help better define applicability or refine application of RDT assumptions and survival strategies.

This study was significant because it evaluated how childcare program type and recovery funding used impacted the childcare program's recovery time. It looked at various characteristics like type and number of recovery funding resources used, as well as childcare program types (e.g., nonprofits or forprofit, corporate affiliations, childcare

program location status (leased/owned) and other factors) to see how recovery time may have varied as a result of these or combinations of these variables. Surprisingly, many of the aforementioned childcare program factors did not result in significant impacts on recovery time, but the data does indicate value in research replication and expansion to other disasters to help determine the true state of childcare recovery postdisaster. Despite the conclusions found by the 2010 National Commission on Children and Disasters about the underprepared nature of childcare for disaster, very little research to date has been conducted on childcare recovery (National Commission on Children and Disasters, 2010). This study helped fill a gap on current childcare recovery information and helped advance the practice of public policy and administration through provision of this baseline data.

Conclusions

This study help set the baseline for childcare recovery research. The survey results revealed interesting insight into childcare recovery funding resources utilized. With the exception of Research Question 3, which asked if differences in recovery time could be a result of the number of childcare recovery resources utilized, the results were not statistically significant. Childcare is a critical part of our community, yet very little is understood about its' vulnerability to disaster and ability to recover. Increasing research has indicated that childcare is important to not just the recovery of the community, but to the recovery of children as well. This study was not without limitations, yet it provided value both to setting the stage for social change, as well as modifying a theory (RDT) typically applied to describe corporate behavior, to a more literal exploration of survival

behaviors and the value of recovery resource diversification. More research is needed, and fortunately, or unfortunately, more disasters have occurred since Superstorm Sandy that can help expand the baseline of childcare recovery understanding. Greater understanding is the first step in development of policy that enables childcare recovery, which in turn could enable the recovery of both the children in an affected community, as well as the community writ large. Disaster policy has evolved over the years and has expanded to include key resources and critical infrastructure in the recovery equation. Given the importance of childcare to both community recovery and the recovery of children, perhaps it's time to expand it once again. I hope that the data provided in this study can be the first step in building the case for positive social change to do so.

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Appendix: Instrument Survey Questions

QUESTIONS FOR SURVEY

1. Were you the owner or director of this childcare program when Superstorm Sandy made landfall in October 2012?
    a. Director
    b. Owner
    c. Director and Owner
    d. Neither

2. Which state authority was your childcare program legally registered/licensed with when Superstorm Sandy made landfall?
    a. New York City Department of Health, Bureau of Day Care
    b. New York State Office of Children and Family Services
    c. State of Connecticut Office of Early Childhood
    d. State of New Jersey Department of Children and Families
    e. If you registered with another agency or were not required to register please comment here

3. How many years had the childcare program been in operation when Superstorm Sandy made landfall?

4. Is your childcare program still in operation now?

5. What year did your childcare program close?

6. Was the closure of your childcare program due to Superstorm Sandy?

7. What state was your childcare program located in?
    a. Connecticut
    b. New Jersey
    c. New York (other than New York City)
    d. New York City
    e. Other

8. What county in Connecticut was your childcare program located in?
    a. Fairfield
    b. New Haven
    c. New London
    d. Mashantucket Pequot Indian Reservation
    e. Other (please specify)

9. What county in New Jersey was your childcare program located in?

a. Atlantic
b. Bergen
c. Burlington
d. Camden
e. Cape May
f. Cumberland
g. Essex
h. Gloucester
i. Hudson
j. Hunterdon
k. Mercer
l. Middlesex
m. Monmouth
n. Morris
o. Ocean
p. Passaic
q. Salem
r. Somerset
s. Sussex
t. Union
u. Warren
v. Other (please specify)

10. What county in New York was your childcare program located in?
    a. Bronx
    b. Kings
    c. Nassau
    d. New York
    e. Orange
    f. Putnam
    g. Queens
    h. Richmond
    i. Rockland
    j. Suffolk
    k. Ulster
    l. Westchester
    m. Other (please specify)

11. Was your childcare program location…
    a. Leased or rented at the time of Superstorm Sandy impact?
    b. Owned at the time of Superstorm Sandy impact?
    c. Other (please specify)

12. At the time of Superstorm Sandy impact, was your childcare program…

a. Nonprofit?
b. Privately Owned (Forprofit)?
c. State or Federally Funded?
d. Mixed funding (either forprofit or nonprofit mixed with state or federal funding)?

13. Was your childcare program a franchise or part of a corporation (i.e., KinderCare, Bright Horizons, Childtime, Goddard, etc.)?

14. At the time of Superstorm Sandy impact, was your childcare program residential or nonresidential?…
    a. Residential (i.e., operated within a home)
    b. Nonresidential (i.e., operated within a school, church, or other nonresidential building)

15. How many days was your childcare program closed as a result of Superstorm Sandy?

16. How many days was your childcare program closed due to Superstorm Sandy damage (past restoration of public services/utilities)?

17. Was there any cost to repair or reopen your childcare program after Superstorm Sandy?
    a. Yes
    b. No. (Please explain: i.e., I did not put money towards repair, I closed or relocated, I could not afford it, etc.)

18. What was the extent of damage your childcare program experienced due to Superstorm Sandy?
    a. < $5,000
    b. $5,001 - $10,000
    c. $10,001 - $25,000
    d. $25,001 - $50,000
    e. $50,001 - $100,000
    f. $100,001 - $250,000
    g. $250,001 - $500,000
    h. >$500,000

19. Which of the following predisaster resources did you apply towards your childcare program recovery (select all that apply)?
    a. Business Property Insurance
    b. Personal Insurance
    c. Commercial Business Liability Insurance
    d. Business Savings

e. Home Owners Insurance
f. Personal Savings
g. Vehicle Insurance
h. None of the above
i. Other (please specify)

20. In regards to insurance, was the insurance you had enough to cover the cost of repairs to your childcare program resulting from Superstorm Sandy?
    a. Yes
    b. No

21. Please select the reason or reasons why insurance was not enough to cover the cost of repairs to your childcare program resulting from Superstorm Sandy.
    a. I did not have business insurance. Please indicate why not (for example: insurance was too expensive, I thought it was not needed, etc.) in the comment box below.
    b. I did not have enough business insurance. Please indicate what was not enough (for example: damage exceeded coverage amount, etc.) in the comment box below.
    c. I did not have the "right" kind of insurance. Please indicate what was missing (for example: I needed flood, hurricane or an additional damage rider or another type of business insurance that I had not previously purchases or separate of what insurance I had) in the comment box below.
    d. Please provide additional information here:

22. How important were the following predisaster resources in aiding your childcare program recovery?

	No value at all	Provided some help	Had a significant impact / made a difference	Could not have done without	n/a
Business Property Insurance					
Commercial Business Liability Insurance					
Home Owners Insurance					
Vehicle Insurance					
Personal Insurance					
Business Savings					
Personal Savings					

Other (see previous question)					

23. Which of the following postdisaster resources did you apply towards your childcare program recovery (select all that apply)?
    a. Grants or Gifts
    b. Loans
    c. None of the above
    d. Other (please specify)

24. Did you apply for a Small Business Administration (SBA) loan?
    a. Yes
    b. No

25. Why did you not apply for a Small Business Administration (SBA) loan?
    a. I didn't know about it or I never heard of SBA loans
    b. I didn't know how to apply
    c. I did not think I would qualify
    d. Other (please specify)

26. Did you receive a Small Business Association (SBA) loan?
    a. Yes
    b. No

27. If you used loans for your childcare program recovery, what type(s)?
    a. Loans from family / friends
    b. Loans from a financial institution (i.e., bank/credit union)
    c. Loan from the Small Business Association (SBA)
    d. I did not utilize loans for my childcare program recovery
    e. Other (please specify)

28. If you used gifts or grants for your childcare program recovery, what type(s)?
    a. Federal grants (FEMA – Individual Assistance (IA) grant/ housing)
    b. Federal grants (FEMA – Public Assistance (PA) grant)
    c. Grants from nonprofit or charitable organizations
    d. Grants / gifts from individuals
    e. State grants (Social Services Block Grant (SSBG) or others)
    f. I did not utilize grants/gifts for childcare recovery
    g. Other (please specify)

29. How important were the following postdisaster resources in aiding your childcare program recovery?

	No value at all	Provided some help	Had a significant impact / made a difference	Could not have done without	n/a
Grants or Gifts					
Loans					
Other (see previous question)					