Family Resilience Following the Deepwater Horizon Oil Spill: Theory and Evidence

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Abstract

Family resilience raises the question of how family units adapt to external shocks. One notable form of such shocks are disasters. Research shows that disasters are occurring with greater frequency and severity throughout the world. Natural and human-made hazards pose an ongoing threat to positive family functioning everywhere, making it difficult to ignore the importance of disaster resilience for research and practice concerning family wellbeing. In this chapter, we examine the issue of family resilience in the context of disaster. We begin by articulating what is meant by *hazards* and *disasters* and how that links to *family resilience*. In doing so, we stress the importance of *adaptive capacity* and *trajectories over time*. We then provide an illustration of ongoing research related to the Resilient Children Youth and Communities (RCYC) Project, a joint venture between researchers at Louisiana State University (LSU) and Columbia University's National Center for Disaster Preparedness (NCDP), concerning family resilience in the context of the BP Deepwater Horizon oil spill. We then close by outlining considerations for research, policy, and practice.

Keywords: adaptive capacity; disaster; hazard; oil spill; resilience

Family resilience raises the question of how family units adapt to external shocks. One notable form of such shocks are disasters. Research shows that disasters are occurring with greater frequency and severity throughout the world (Brunsentev & Vroman, 2017). Natural and human-made hazards pose an ongoing threat to positive family functioning everywhere. Implied in this reality is climate change, which is resulting in increased precipitation, sea level rise, and extreme temperatures around the globe (Fischer & Knutti, 2015). Indeed, a committee convened by the National Academies did not mince words in declaring disaster resilience "a national imperative" in the United States (National Research Council, 2012). The committee stated eight reasons to support this contention (2012, p. 14):

1) Disasters will continue to occur, whether natural or human-induced, in all parts of the country;

2) The population will continue to grow and age as will the number and size of communities; in some regions population decline and the number and size of communities will create a different set of challenges as tax bases decline;

3) Demographic data demonstrate that more people are moving to coastal and southern regions-areas with a high number of existing hazards such as droughts and hurricanes;

4) Public infrastructure is currently aging beyond acceptable design limits;

5) Infrastructure such as schools, public safety, and public health that are essential to communities are facing economically difficult times as the population grows and ages;

6) Economic and social systems are becoming increasingly interdependent and thus increasingly vulnerable should a key part of the system be disrupted;

7) Risk cannot be eliminated completely, so some residual risk will continue to exist and require management;

8) Impacts of climate change and degradation of natural defenses such as coastal wetlands make the nation more vulnerable.

Taken together, it becomes difficult to ignore the importance of disaster resilience for research and practice, and its implications for family functioning.

In what follows, we examine the issue of family resilience in the context of disaster. We begin by articulating what is meant by *hazards* and *disasters* and how that links to *family resilience*. In doing so, we stress the importance of *adaptive capacity* and *trajectories over time*. We then provide an illustration of ongoing research related to the Resilient Children Youth and Communities (RCYC) Project, a joint venture between researchers at Louisiana State University (LSU) and Columbia University's National Center for Disaster Preparedness (NCDP) concerning family resilience in the context of the BP Deepwater Horizon oil spill (DHOS). We then close the chapter by outlining considerations for research, policy, and practice.

Family Resilience in the Context of Disaster

The social scientific study of disasters has long sought to understand how hazard events upset and disorganize "the essential functions of society" (Fritz, 1961, 655). *Hazards* can be broadly understood to be situations or events that pose a potential threat to people and property. Hazards become *disasters* once the potential threat is actively realized. For example, a hurricane churning in ocean waters represents a hazard, that can in turn morph into a disaster depending on the scale of the impacts once the wind and water make landfall. Importantly, disasters are generally not conceptualized by social scientists to be single-point-in-time events, but as social *processes* that unfold over the course of time (e.g., Brunsma & Picou, 2008; Kreps, 1989; Kreps & Drabek, 1996; Quarantelli & Dynes, 1977). Accordingly, Quarentelli (2000, 62) frames

disasters as change processes in which "the routines of collective social units are seriously disrupted and when unplanned courses of action have to be undertaken to cope with the crisis." Families are on the front line in such contexts. Understanding how families differentially anticipate, prepare, resist, cope, and recover from disasters thus becomes a critical task for science, policy, and practice.

Social units and systems are not uniformly able to navigate the challenges posed by disasters. Instead, families and other social groups possess sets of traits and characteristics that variably influence their adaptive capacity to cope with disaster impacts (Henry, Morris, & Harris, 2015; Wisner, Blaikie, Cannon, & Davis, 2004). Accordingly, like disasters, *resilience* is also often conceptualized more as process than outcome (Masten & Monn, 2015; Norris et al., 2008). In this vein, Masten and Monn (2015, 6) define resilience as "the capacity for adapting successfully in the context of adversity, typically inferred from evidence of successful adaptation following significant challenges or system disturbances." This adaptive capacity is generated by different combinations of networked resources that can be called upon in the face of risk and social disruption.

Drawn from work by the Consortium for Resilient Gulf Communities (Finucane et al. 2019) and Abramson et al.'s (2015) Resilience Activation Framework (RAF), Figure 1 provides a framework for thinking about resilience as adaptive capacity. The first takeaway from this figure is that resilience is multisystem, multilevel, process-oriented, and dynamic. The adapted model begins with a multisystem and multilevel context, which is centered on the family unit given the focus of this volume. The family is in turn embedded in community, a policy context, built environment, and natural environment. All of these systems are comprised of their own sets of characteristics and traits prior to the occurrence of a hazard event. Once a hazard has

presented itself, there is a disturbance to the system resulting in social disruption. Social disruption is then posited to interface with a set of networked adaptive capacities that present families (and other social units) with variable assets and deficits for coping. Such capacities are networked in the sense that they are not wholly independent of one another, but are instead interrelated in important ways (i.e., they can substitute, complement, amplify, and mute each other). Here we use the "capitals" framework suggested by Abramson et al. (2015) to illustrate this idea, where in the face of a stressor a family will have differential resources in the form of different types of capital, including education and skills (human capital); job stability, security, and income (economic capital); social network ties and voluntary group memberships (social capital); and efficacy in the political system (political capital). A family's reaction to the disturbance over time is in turn dependent upon its ability to activate resilience (i.e., draw upon assets and mitigate deficits existing in its networked resources) to influence its trajectory toward wellbeing-related outcomes (e.g., health, positive functioning). The advantage of conceptualizing family disaster resilience in this manner is that it frames an understanding of resilience as a process, and provides a structure for testing how differential access to social resources influence positive adaptation and coping. A better understanding of these mechanisms can serve as a guide for preventative and early intervention programs aimed at activating and sustaining resilience during disasters (Abramson et al., 2015).

[Figure 1 about here]

Differential Impacts by Disaster Type

Researchers and responders have traditionally classified disasters as either "natural" (i.e., an "Act of God") or "technological" (i.e., human-made). Studies have shown that in natural

disaster contexts, while there is often great disruption to the social system, there is also a collective sense that no one is to blame, consensus on the legitimacy of victims and their need for aid, and general social cohesion on moving toward recovery. Technological disasters, on the other hand, have been linked to the emergence of "corrosive community," a context in which those affected develop contested narratives around impacts, responsibility, and blame, that in turn become a source of rancor, discord, and protracted litigation. These dynamics ultimately generate more severe and chronic social and health consequences compared to natural disasters (Couch & Kroll-Smith, 1985; Gill & Picou, 1998; Kroll-Smith & Couch, 1993; Marshall, 2004; Marshall, Picou, & Schlichtmann, 2004; Picou, Marshall, & Gill, 2004; Ritchie, Gill, & Farnham, 2013).[1] A key element of corrosive community is the emergence of "recreancy," which focuses on the erosion of trust in institutions. More specifically, recreancy is "the failure of experts or specialized organizations to execute properly responsibilities to the broader collectivity with which they have been implicitly or explicitly entrusted" (Freudenburg, 2000, p. 116; see also Freudenburg, 1993). In technological disasters, there is a primary responsible party to blame and hold accountable for damages, but there are also often other organizations—notably, government agencies tasked with regulation, risk mitigation, and response—that are also culpable (Gill et al., 2014). For example, a corporation may be responsible for an industrial accident, but government entities with a responsibility for regulating that industry may be guilty of lax oversight or blameworthy for a lackluster response once a disaster process has begun to unfold (e.g., Federal Emergency Management Agency or FEMA).

[1] There is also growing recognition that many disasters can be conceptualized as "natech"—with combined natural and technological disaster elements. Picou (2009) points to the storm effects and infrastructural failures (in particular, petrochemical releases) related to Hurricane Katrina as a notable example.

Oil spills represent a prime example of a technological disaster, especially those on the scale of the Exxon Valdez oil spill (EVOS) in 1989 and the DHOS in 2010.[2] A substantial body of literature has been developed in the three decades since the EVOS documenting the emergence of corrosive community and long-lasting negative impacts on psychosocial health in communities affected by that disaster (Gill, Ritchie, & Picou, 2016). Researchers who played a central role in building the EVOS literature predicted the DHOS as a likely "rerun" (Ritchie, Gill, & Picou, 2011), and this estimation has proven largely accurate to date. Accordingly, the DHOS has been linked to heightened social disruption, recreancy, and myriad forms of psychosocial stress (Ayer, Engel, Parker, Seelam, & Ramchand, 2018; Cope & Slack, 2017; Cope, Slack, Blanchard, & Lee, 2013, 2016; Gill et al., 2014; Lee & Blanchard, 2012; Parks, Drakeford, Cope, & Slack, 2018; Ritchie, Gill, & Long, 2018).

The Context of the BP Deepwater Horizon Oil Spill

On April 20, 2010, the BP-leased Deepwater Horizon oil rig exploded about 50 miles offshore of Southeast Louisiana. Eleven workers on the platform were killed by the blast and the subsequent sinking of the structure ruptured the seafloor wellhead, which in turn gushed crude oil into the Gulf of Mexico at a rate of 50,000 barrels a day for nearly 3 months. It is estimated that approximately 210 million gallons of oil were released into the Gulf before the wellhead was brought to a static state, surpassing the EVOS in scale, and resulting in the largest accidental

[2] Some reject referring to events like these as "spills"—or even to characterizing many disasters as "technological" per se—arguing that the terms minimize the scope and complexity of such disasters. For example, Perrow (1984) posited that accidents of this type were inevitable in highly complex and tightly coupled systems characterized by catastrophic risk, and that to identify the source as a mere failure of technology is misguided. See also Beck (1992).

marine oil spill in history (CNN, 2018; Robertson & Krauss, 2010).[3] Like the EVOS before it, the DHOS unleased cascading impacts on the surrounding natural environment and human settlements on the coastline.

Importantly, the Gulf of Mexico plays a central role in the economy and culture of the region, with particular emphasis on the seafood and energy industries (Austin, 2014; Henry & Bankston, 2002). The Louisiana Gulf Coast produces 26% (by weight) of continental U.S. commercial fisheries landings, and supports infrastructure supplying 90% of the nation's outer continental shelf oil and gas (Coastal Restoration and Protection Authority, 2013). In short, the lives and livelihoods of the region's people are very much tied to the Gulf of Mexico.

Preliminary Evidence from the Resilient Children, Youth, and Communities Project

In 2015, a team of researchers from LSU and the NCDP came together to examine the unfolding social and public health impacts from the DHOS five years after the onset of the disaster. These efforts were organized as the RCYC study and funded by the Gulf of Mexico Research Initiative (GoMRI). RCYC has the unique features of using a geographically targeted, longitudinal, and mixed methods research design. The geographic approach enables the team to examine spill-affected communities in a manner that larger population-based studies cannot (i.e., disaster impacts can be "washed out" in larger regional samples because affected areas are more localized). The longitudinal design facilitates the study of the DHOS as a *disaster process*, rather than a single-point-in-time event. The application of mixed methods provides the opportunity to

[3] During the Gulf War in 1991, Iraqi forces intentionally released as much as 336 million gallons of oil into the Persian Gulf (CNN, 2018). Importantly, this was a purposeful action in the context of war; a disaster to be sure, but no accident.

triangulate different types of information to provide a fuller account of disaster impacts and resilience.

RCYC leveraged previous research efforts undertaken by the NCDP. Specifically, in 2012, NCDP used a multi-stage sampling design to select communities, census blocks, and households with children to build a dataset concerning the impacts of the DHOS in Louisiana, Mississippi, Alabama, and Florida.[4] An impact index was calculated to identify spill-affected communities. Data availability necessitated the use of zip codes as proxies for communities. Three sources of data were leveraged to create the index: 1) individual claims data from the Gulf Coast Claims Facility (zip code), 2) business claims data from the Gulf Coast Claims Facility (zip code), and 3) aggregated coastline oiling data from National Oceanic and Atmospheric Administration's Shoreline Cleanup and Assessment Technique (latitude/longitude). Z-scores were calculated for each of the three variables by zip code and then summed to create an overall oil impact index for each community. The product was a standardized index where higher values indicated zip codes where more assistance claims were filed and/or shoreline oiling conditions were more pronounced. Zip codes were then rank-ordered using the index (see Fig. 2), and the top-ranked communities were then identified as the sampling frame (N=8 in Louisiana).

Within these communities, a two-stage cluster sampling design was utilized to randomly select census blocks, and within these blocks households with children. More specifically, an average of 15 census blocks per community were randomly selected, with target enrollments set using block density of households with children. Drawing on 2010 Census data, census blocks were chosen if at least 70% of the households were occupied and if there were at least 5 households with children. Households were approached based on a two-armed protocol. If a

[4] For a more detailed account of this work, see Abramson et al. (2013).

block had less than 40 occupied households, every household was approached to determine eligibility. Household eligibility was determined by the presence of at least one child between the ages of 3 and 18 years old and a parent or caregiver age 18 years or older. If a block had more than 40 occupied households, then households were approached based on data purchased from InfoUSA which provided a list of addresses with children in the household. To mitigate potential biases in the purchased list, households to the left and right of a selected household were also approached. In addition, a 1:1 matching household was selected from the block based on random points generated by a geographic information system software, and, again, neighbors to the left and right of that household. Once an eligible household was recruited, the child in the home with the most recent birthday was chosen as the reference for child-focused questions (Binson, Canchola, & Catania, 2000).

[Fig. 2 about here]

In 2014, NCDP returned to households in Louisiana only. Since the initial surveys conducted in 2012 were anonymous, the research team revisited the previously interviewed addresses and collected identifiable information to populate the cohort database. The RCYC team then followed up with the same group of respondents in 2016 and 2018. Tracking and tracing techniques resulted in a 74% retention rate between the first and second waves (Hill & Willis, 2001; Laurie, Smith, & Scott, 1999; Lugtig, 2000). The survey instrument covered topics such as direct and indirect oil spill exposure, physical and mental health status, perceptions of recovery, demographic data, and a range of characteristics theoretically linked to social vulnerability and resilience.

In 2017, a subsample of survey respondents was selected to participate in focus group discussions. Respondents were selected from six communities across the region in order to

capture variation in geographic impacts. Within each community people were purposively selected to achieve a mix of different experiences with health and economic impacts from the DHOS (i.e., those that did and did not report such impacts in the survey). Ultimately, the research team conducted focus groups in six different communities with a total of 46 participants. Moderators used an open-ended interview guide to lead the discussions. The sessions resulted in over nine hours of audio-recorded narrative data that was later transcribed and coded for emergent themes.

This mixed method approach sought to answer three broad sets of questions: 1) What are the social and public health impacts of the DHOS; 2) What attributes of families are related to greater resilience and vulnerability to the disaster; and 3) How does all of this change over time? In what follows we present preliminary RCYC data from the 2014 and 2016 surveys (N=484) and 2017 focus groups (N=46) as an empirical illustration of the DHOS as a social disruption process unfolding over many years.

Figure 3 shows the percentage of RCYC respondents reporting direct and indirect exposure to the DHOS by type in 2014. The data reveal that DHOS exposure was not uncommon among respondents. Nearly one-quarter (23%) reported direct physical exposure of a parent, 14% direct physical exposure of a child, and 40% parental exposure by smell. Further, over one-third (36%) reported income loss and 15% job loss attributed to the DHOS.

[Fig. 3 about here]

In Figure 4 we present odds ratios (OR) from simple (bivariate) logistic regression models predicting whether a child experienced negative mental/behavioral health symptoms in 2014 and 2016 (yes=1) by type of DHOS exposure in 2014. The negative child mental/behavioral health issues that were probed include depression, anxiety, trouble sleeping,

and getting along with other children. These symptoms are based upon parental report, not a clinical diagnosis. The ORs represent the odds that a child had experienced mental/behavioral health challenges given a particular DHOS exposure, compared to the odds of that outcome occurring in the absence of that exposure. An OR greater than 1 indicates an increased occurrence of the event and an OR less than 1 indicates a decreased occurrence of the event. In all cases, reported ORs are statistically significant ($p<.000$).

[Fig. 4 about here]

The results reveal that every type of DHOS exposure is related to significantly greater odds that a child is experiencing negative mental/behavioral health symptoms. In 2014, physical oil spill exposure by the child is linked to nearly five times the odds (OR=4.8) that a child had a health symptom. Exposure by smell (OR=3.3), family income loss (OR=3.4), and family job loss (OR=3.5) are all linked to more than three times the odds of a child health challenge. And physical oil spill exposure by a parent is associated with more than twice the odds (2.6) of the child experiencing a negative mental/behavioral health symptom. In 2016, in all cases these relationships are weaker, suggesting a degree of recovery over time. Nonetheless, family DHOS exposure remains associated with about twice the odds of children experiencing mental/behavioral health challenges (ORs range from 1.8 to 2.5). The analysis presented here does not explore intervening variables that influence further resilience and vulnerability in these relationships. However, it is clear that DHOS exposure is positively correlated with negative psychosocial impacts for children in the affected region.

Our focus group data help to contextualize these quantitative relationships. Members of our focus groups discussed the effects of cumulative risk associated with recurring disasters on the psychosocial stress experienced by their families. People in this region of the country have

not only been impacted by the DHOS in recent history, but also the slower moving threats of sea level rise and land subsidence, as well as impacts from multiple hurricanes, perhaps most notably Hurricane Katrina in 2005 (Cope et al., 2018). As one focus group respondent shared:

> We just got back on track from Katrina, you know, destroying our whole house. Everything was ripped—ripped out, ripped up—everything. I mean, we got rid of everything. The whole house was just like a frame. So, we started from scratch, and then [the oil spill] happened.

Other respondents discussed how the stressors caused by the DHOS disrupted their livelihood strategies. Oil spills often have multiplier effects that hurt people economically across a host of industries, but are known to have especially pernicious effects on renewable resource communities (Cope et al, 2013; Gill et al., 2016; Marshall et al., 2007; Parks et al., 2018). One of our focus group respondents noted that her family had traditionally depended on fishing to make a living by constructing and selling nets and crab traps, harvesting oysters, and trolling for fish and shrimp. However, the negative impacts of the DHOS had caused her family to abandon this way of making a living, imposing both an economic and cultural blow. She shared with the group:

> The trolling business is not doing good. Me and my husband have went back to school. We got our GED diplomas. We're now in college…[studying] to become nursing assistants…[We made this change] because the shrimping and the oystering and all of that is no good for us [since the oil spill]. We have to actually look for [new] things that don't really meet [the] lifestyle that we're used to…the bayou life.

The findings from the RCYC project outlined above provide evidence of the ways in which the DHOS has impacted family wellbeing in South Louisiana. This evidence suggests that direct and indirect family exposure to the oil spill is correlated with greater child psychosocial health challenges four and six years after the disaster began. Further, this research points to the role of cumulative risk for families in a disaster-prone setting and disruption of cultural lifeways, both of which research has suggested pose threats to family resilience (Masten & Munn, 2015).

These findings are preliminary. The incorporation of a third wave of survey data (2018), multivariate and multivariable longitudinal modeling techniques, and continued coding and sifting through the themes in the focus group data will all allow for a more sophisticated analysis of family resilience as this research progresses. One thing, however, is clear: for families in the spill-affected region, the DHOS was not an event that happened back in 2010, but rather a process of disruption that continues to impact families to this day.

Implications

Implications for understanding family resilience

The material covered thus far presents a host of implications for the study and promotion of family resilience. One cross-cutting implication is that the threats posed to families by disasters are multisystem, multilevel, process-oriented, and dynamic. Approaches to the question of family resilience must recognize that families are embedded in and interrelated with other systems and levels of analysis, and that disaster processes pose potential (and often different) threats to functioning across and within them. This reality means that siloed knowledge and expertise will not work well in building a comprehensive understanding of the resilience process, and that instead a truly integrated transdisciplinary multisystem perspective is called for (Finucane et al., 2019; Masten & Monn, 2015). This is hard work. It requires that scholars and practitioners work across disciplines and professions, span boundaries, and make their tools, language, and expertise accessible to others. In a modern world, characterized by a complex and specialized division of labor, this is no easy task. This is not to suggest that all work in this area must be all-systems encompassing—such a suggestion would obviously be impractical—but it does require a broader awareness and openness in all aspects of research and practice.

A second cross-cutting implication is the need to think about disasters and family resilience as a process rather than an outcome, as a question of adaptive capacity over time (Abramson et al., 2015; Finucane et al., 2019; Masten & Monn, 2015; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008). Scholarship and practice must acknowledge that snapshots at single time points and one-time interventions are unlikely to yield great dividends and may even mislead us. The dynamism of resilience in families and other systems requires a commitment to thinking about longitudinal dynamics.

Implications for practice and policy

The concept of resilience incorporates an ecological view of human and environmental systems that is especially useful in interdisciplinary dialogue around disaster prevention, preparedness, response, and recovery. As noted above, for people living in South Louisiana the DHOS is not an isolated disaster, but one of many they have experienced in recent memory. In the aftermath of the DHOS, billions of dollars are being invested in planning, implementing, and monitoring of restoration activities across the Gulf of Mexico (Coastal Protection and Restoration Authority, 2018). Supporting resilient coastal families and communities is an important part of this process. The scale and complexity of addressing needs on the "human coast" warrants a reflexive approach to policy—plans that can be adjusted over time alongside evolving understandings of the social, public health, and economic outcomes of the DHOS and other disasters. Research endeavors like RCYC have an important role to play in this process.

In order to motivate efforts to bolster resilience, it is critical to understand the patterns of economic and human impacts following disaster and to share that understanding with stakeholders (National Research Council, 2012). The RCYC study offers a unique dataset with

rich insight into outcomes for children and families affected by the DHOS. This data is publicly available through GoMRI's open data-sharing policy, which ensures a data and information legacy that promotes continual scientific discovery and public awareness (Gulf of Mexico Research Initiative, 2018). Open data-sharing policies offer social and economic value by reducing barriers to information access (National Research Council, 2012; Zuiderwijk, Janssen, & Davis, 2014). Easily accessible, empirical information about the economic and human impacts of disaster may be especially important to community practitioners seeking to establish evidence-based programming to promote resilience through capacity-building.

From the standpoint of practice, building adaptive capacity for families and communities involves the development of sustainable skills, shared resources, and organizational structures by fostering knowledge, leadership, and the ability to represent diverse group interests (National Research Council, 2012; Wagner, Chhetri, & Strum, 2014). The process of capacity-building is rooted in social, political, and economic contexts, and cannot be conducted without a robust understanding of these dynamics (Chandra, Acosta, Stern, Uscher-Pines, & Williams, 2011). One example of capacity-building around mental health within spill-affected communities is the Gulf of Mexico Peer Listening Program. This program provides training to community-members that allows them to support others in disaster contexts through a combination of counseling, crisis intervention skills, and sharing their own lived experience (Picou et al, 2004).

Parents and caregivers in spill-affected areas may be interested not only in accessing knowledge about disaster trends and outcomes in their communities, but also in resilience resources and tools. NCDP, in partnership with Save the Children and funding by GSK, completed a pilot project called the Resilient Children/Resilient Communities Initiative (RCRC). Using the lens of preparedness, the initiative aimed to strengthen planning efforts of

organizations, both formal and informal, which serve children on a daily basis or may do so during a disaster. By bolstering organizational preparedness, these groups can better buffer affected families and help normalcy or routine be reestablished more quickly, resulting in better outcomes for children (Abramson, Park, Stehling-Ariza, & Redlener, 2010). Through this project, an online toolbox of resources for parents and families, community emergency planners, and policymakers has been developed to help people better prepare for the unexpected.[5] Additional stakeholders for such tools include, but are not limited to, social workers, counselors, pediatric healthcare providers, teachers and others involved in K-12 education, and community health workers.

The National Commission on Children and Disasters' *2010 Report to the President and Congress* identified mental health, physical health, and disaster case management as three out of ten critical areas in policy/programming that must be addressed to better meet the needs of children following disaster. Community-level resources such as integrated behavioral health services are suggested as being especially effective in addressing interrelated mental and physical health concerns (Osofsky, Osofsky, Wells, & Weems, 2014). Interventions in school settings have also been shown to foster resilience in youth following an adverse event (Baum, Rotter, Reidler, & Brom, 2009). Because the impacts of a disaster like the DHOS can be expected to unfold over many years, providers in affected areas should be trained not only in immediate response, but also in the provision of long-term, multisystem, culturally appropriate, and accessible services (Miller & Pescaroli, 2018; Osofsky et al, 2014).

The above conceptualization of resilience relates closely to systems and strengths-based approaches to provide services in mental health, nursing, and education settings (examples

[5] This resource can be accessed at https://rcrctoolbox.org.

include biopsychosocial, person-in-environment, family systems perspectives). This conceptual overlap may facilitate translation of empirical evidence into evidence-based-practice (Maston & Monn, 2015). Practitioners in spill-affected areas can utilize these concepts to engage in capacity-building activities with children and families through a combination of education, community engagement, case management, advocacy, and resource-brokering. Effective work with families and children requires an applied understanding of the links between family dynamics and broader social and environmental processes (Hernández, Almeida, & Dolan-Delvecchio, 2014). Empirical knowledge surrounding oil spill exposure and human outcomes can provide another dimension of contextual understanding to work with children and families in clinical, school, and home settings.

Conclusion and Future Directions

This chapter has provided an overview of theory and empirical evidence concerning family resilience in the context of disaster. In doing so, we have stressed the importance of avoiding the conceptualization of disasters as single-point-in-time events, and instead as processes than unfold over longer time horizons. From the standpoint of research and practice on family resilience this means framing approaches to the issue in terms of *adaptive capacity* and *trajectories over time*. We know that disasters are increasing in severity and frequency the world over (Fischer & Knutti, 2015), making it imperative that we build a better understanding of disaster resilience in terms of science, policy, and practice (National Research Council, 2012). We fail to do so at our peril.

There is a great deal of work to undertake going forward. Some themes suggested here include the need for transdisciplinary research that is longitudinal in order to assess human

impacts of disaster as a multifaceted dynamic process. Researchers need to be able to chart the way disaster impacts put families on trajectories toward positive functioning or cascading problems. Importantly, the vast majority of research on disasters is reactionary. That is, resources are only mobilized *after* a hazard has morphed into a disaster. This means researchers often lack a pre-disaster baseline to work from. This poses a major impediment to our understanding of disaster resilience dynamics. While our knowledge is growing, we continue to understand precious little about what people's range of adaptive capacities are and how they are interrelated. Only better data and sustained research attention will get us there, and allow for developing evidence-based practice aimed building resilience capacity pre-disaster, and activating and sustaining resilience once a disaster process is underway.

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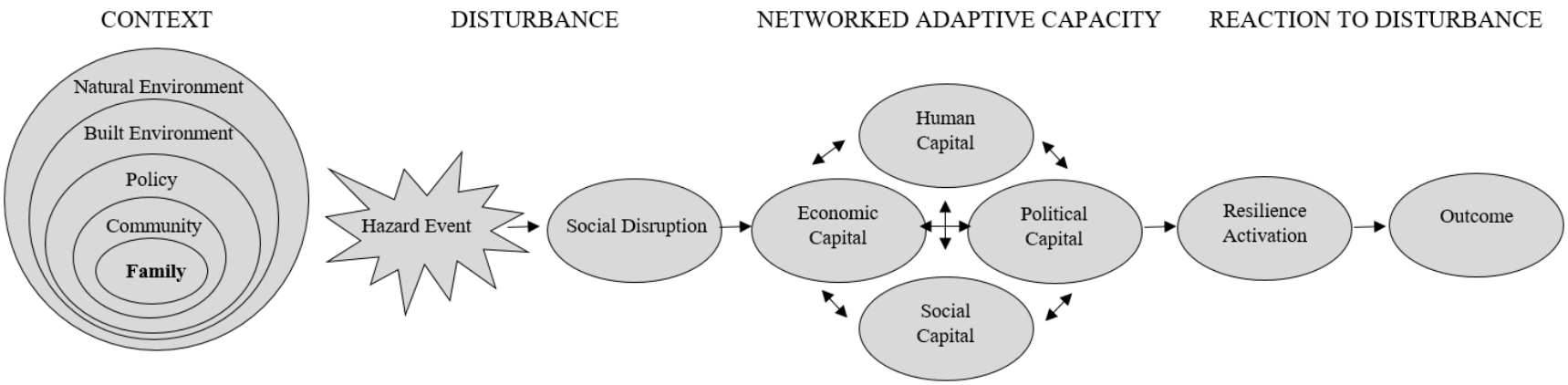

Fig. 1. Conceptual framework of family resilience
Note: Adapted from Abramson et al. (2015) and Finucane et al. (2019).

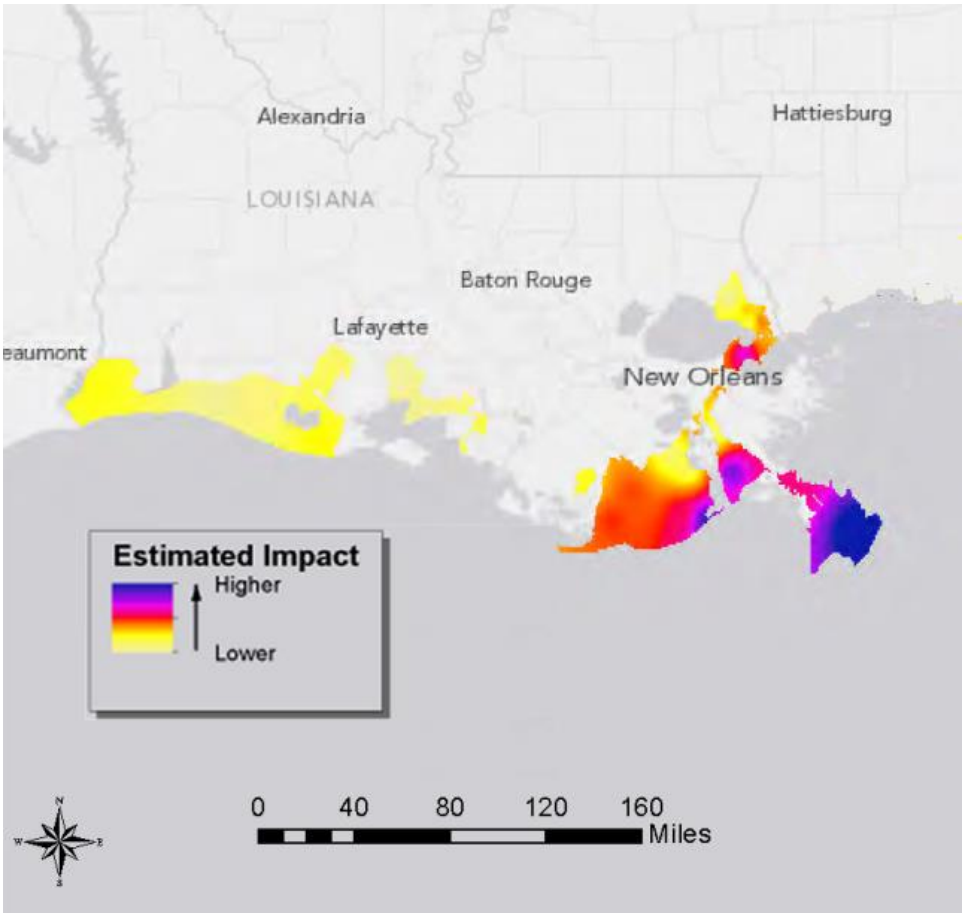

Fig. 2. Estimated oil spill impact in South Louisiana
Source: RCYC project.

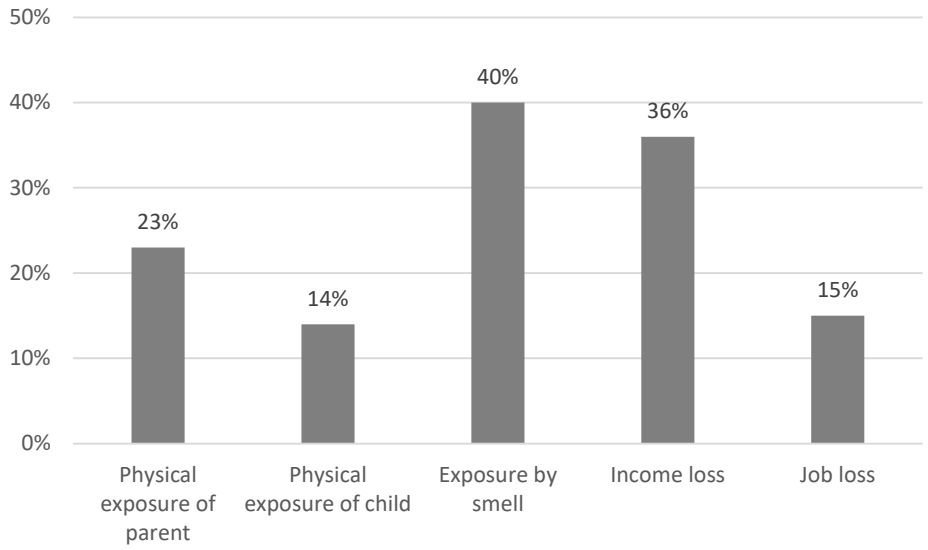

Fig. 3. Percentage reporting oil spill exposure by type, 2014
Source: RCYC project (N=484).

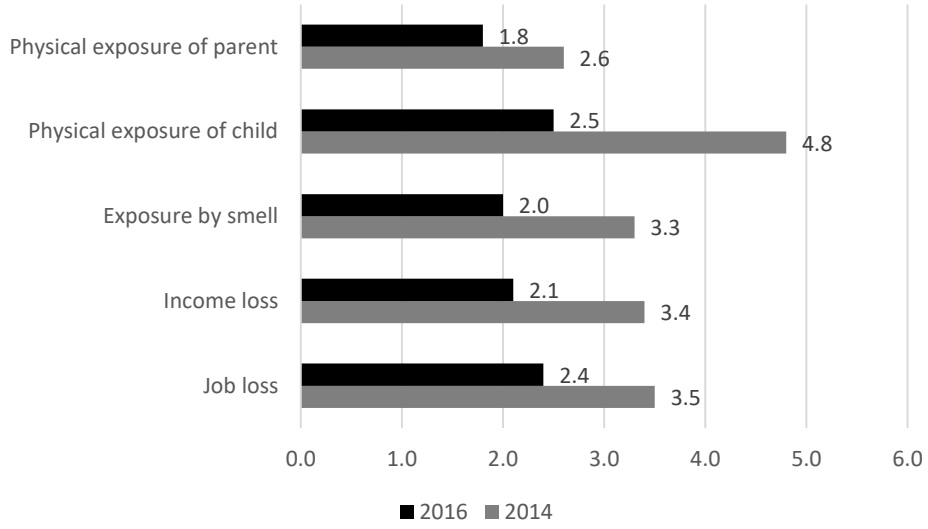

Fig. 4. Odds ratio of child mental/behavioral health problems in 2014 and 2016 (yes=1) by oil spill exposure in 2014 (yes=1), p<.000.
Source: RCYC project (N=484).