

Study 2019	Main Findings	Health Policy Implications
<p>Raker E.J., Lowe S., Arcaya M.C., Johnson S.T., Rhodes J., Waters M.C. (2019). Twelve years later: The long-term mental health consequences of Hurricane Katrina. <i>Social Science and Medicine</i>.</p>	<p>We find that post-traumatic stress symptoms (PTSS) declined at each of the three post-Katrina follow-ups, but 12 years after the hurricane, one in six still had symptoms indicative of probable post-traumatic stress disorder. The rate of non-specific psychological distress (PD) remained consistently higher in all three follow-ups, compared to the pre-disaster period. In full covariate-adjusted models, no sociodemographic variables predicted long-run combinations of PTSS and PD. However, 12 years later, exposure to hurricane-related traumatic events and pre-disaster PD significantly predicted co-occurring PTSS and PD. Hurricane-related housing damage predicted PTSS in earlier follow-ups, but no longer predicted PTSS in the long-term. Furthermore, hurricane-related traumatic events significantly differentiated the risk of having persistent PTSS, relative to recovering from PTSS. The results suggest that there is still a non-negligible group of survivors with continued need for recovery resources and that exposure to traumatic events is a primary predictor of adverse mental health more than a decade post-disaster.</p>	<p>This study has several clinical and practical implications. Clinically, the high rate of PTSS in the long-term suggests that survivors' disaster experiences should continue to be addressed as part of treatment. On the other hand, pre-disaster PD was a strong predictor of post-disaster outcomes, suggesting a need for services to address more longstanding mental health problems. As argued elsewhere, post-disaster interventions must be culturally informed to address barriers to care, e.g. stigma, specifically among black survivors (Wang et al., 2007). Practically, the results show that natural disasters exact an enduring toll on a sizable proportion of survivors. Disaster response efforts should reduce exposure to traumatic events by removing barriers to evacuation and should provide both immediate and long-term mental healthcare to those who have been exposed. Comprehensive economic and social estimates of natural disasters, especially under conditions of anthropogenic climate change, must therefore consider the enduring toll on mental health.</p>
<p>Schnake-Mahl, W., Sommers, B.D., Subramanian, S.V., Waters, M.C., &amp; Arcaya, M. (2019). Effects of gentrification on health status after Hurricane Katrina. <i>Health and Place</i>.</p>	<p>We employ a quasi-experimental intent to treat design to assess the causal effects of gentrification on health in the RISK population. We do not find evidence of significant main effects of being displaced to a gentrified neighborhood on BMI, self-rated health, or psychological distress. The analysis employs a quasi-experimental design and has several additional unique features—homogeneous population, limited selection bias, and longitudinal data collection—that improve our ability to draw causal conclusions about the relationship between gentrification and health. However, the unique context of displacement by natural disaster may limit the generalizability of our findings to other circumstances or residents experiencing gentrification.</p>	<p>Broadly, proactive policies to build and rebuild affordable housing, and investing in community organizing, social connections, and anchor institutions can help residents remain in their neighborhoods, build resiliency and reduce vulnerability to future disasters. Further, to minimize recovery disparities after natural disasters, governments and emergency management professionals can more equitably distribute rehabilitation resources and bring low-income and working-class voices into the recovery planning and process.</p>

Manove, E. E., Lowe, S. R., Bonumwezi, J., Preston, J., Waters, M. C. & Rhodes, J. E. (2019). Posttraumatic growth in low-income Black mothers who survived Hurricane Katrina. *American Journal of Orthopsychiatry*.

This mixed-methods study aimed to gain knowledge of the lived experience of posttraumatic growth (PTG) in 32 low-income Black mothers whose New Orleans' homes were damaged or destroyed by Hurricane Katrina, and half of whom had relocated indefinitely to Houston. Data from in-depth interviews with participants were examined in conjunction with quantitative scores on the Posttraumatic Growth Inventory (PTGI; Tedeschi & Calhoun, 1996). Participants were interviewed face-to-face on a range of postdisaster experiences, including positive changes, in 2009. Participants also completed the PTGI via a telephone survey within six months of being interviewed. Most (26 out of 32) participants described experiencing PTG within the 5 domains of the PTGI, with the domains most frequently coded, in descending order, being New Possibilities, Relating to Others, Personal Strength, Appreciation for Life, and Spiritual Change. PTG stemmed heavily from exposure to opportunities in survivors' postdisaster communities, including increased racial diversity, improved neighborhoods, and new educational and economic opportunities. Participants' frequency of all PTG codes was associated with their overall PTGI scores with a small-to-moderate effect size ( $r .32$ ;  $p .078$ ) in a relationship that trended toward significance. Without minimizing the catastrophic losses they entail, disasters may in some cases create spaces for PTG for survivors, including through new opportunities in areas where survivors formerly experienced oppression. Policymakers should examine how to make such opportunities available, visible and accessible to individuals absent a disaster.

This study suggests that although natural disasters disproportionately negatively impact individuals with oppressed statuses predisaster—for example, in the United States, women, Blacks, and low-income individuals are much more severely harmed by disasters—in some cases, natural disasters and subsequent relocation can also shake loose some of the entrenched structures of oppression and allow for posttraumatic growth (PTG) related to a reduction in experiences of race-, gender-, and socioeconomic-based oppression. This study highlights that along with more intra- and interpersonally driven growth in the 4 PTG domains of Relating to Others, Personal Strength, Appreciation for Life, and Spiritual Change, Hurricane Katrina precipitated PTG in the New Possibilities domain for our participants that was related to postdisaster experiences of greater equality. Policymakers, clinicians, and others should be attentive to ways in which the aftermath of disasters can provide space to create, and to make visible and accessible, opportunities for oppressed and underserved populations aimed at reducing the impact of racism, sexism and poverty-related oppression. More broadly, this study points to the pressing need to create such policies, absent a trauma or disaster, to assist individuals facing the same obstacles as our participants in accessing similar opportunities.

<p>Morris, K. A. &amp; Deterding, N. M. (2016). The emotional cost of distance: Geographic social network dispersion and post-traumatic stress among survivors of Hurricane Katrina. <i>Social Science &amp; Medicine</i></p>	<p>Social networks offer important emotional and instrumental support following natural disasters. However, displacement may geographically disperse network members, making it difficult to provide and receive support necessary for psychological recovery after trauma. Objectives: We examine the association between distance to network members and post-traumatic stress using survey data, and identify potential mechanisms underlying this association using in-depth qualitative interviews. We find network dispersion is positively associated with the likelihood of post-traumatic stress, controlling for individual-level socio-demographic characteristics, exposure to hurricane-related trauma, perceived social support, and New Orleans residency. We identify two social-psychological mechanisms present in qualitative data: respondents with distant network members report a lack of deep belonging and a lack of mattering as they are unable to fulfill obligations to important distant ties. Conclusion: Results indicate the importance of physical proximity to emotionally-intimate network ties for long-term psychological recovery.</p>	<p>Our work reinforces a need to distinguish between the material and emotional dimensions of social support and the importance of elucidating varied and nuanced mechanisms of emotional support inadequately captured by quantitative perceived emotional support scales. We also underscore how network characteristics both promote and impair health and highlight the value of mixed methods in studies of social networks and health</p>
<p>Waters, M. C. (2016). Life after Hurricane Katrina: The Resilience in Survivors of Katrina (RISK) Project. <i>Sociological Forum</i>.</p>	<p>This article presents an overview of the findings to date of the Resilience in Survivors of Katrina (RISK) Project, a longitudinal study of 1,019 young, predominantly female and African American community college students who were surveyed a year before Hurricane Katrina in New Orleans and then two to three times afterward. This study combines a multidisciplinary, multimethod approach to understanding the immediate and long-term effects of the Katrina disaster on physical and mental health, economic and social functioning, and neighborhood attainment. I discuss what we can learn from the rare inclusion of predisaster data and our unusual ability to follow participants for years after the disaster. I argue that it is important to follow the recovery of individuals and communities as well as the recovery of the city, as</p>	<p>I have stressed in this article that a longitudinal, multimethod, multidisciplinary approach to studying Katrina can contribute to our collective knowledge of the effects of disasters on individuals and families. The focus on the recovery of people, rather than place, is very difficult to maintain unless, like the RISK Project, you have a sampling frame of people from the disaster whom you can follow wherever The RISK Project 15 they relocate. We have found that by following people, we can begin to shed light on the long and complex decision making that goes into relocation and recovery at the individual level.</p>

these are often not the same, especially in Katrina where a large proportion of the city never returned.

Arcaya, M. C., Lowe, S. R., Asad, A. L., Subramanian, S. V., Waters, M. C. & Rhodes, J. (2016). Association of posttraumatic stress disorder symptoms with migraine and headache after a natural disaster. *Health Psychology*.

PTSD symptoms were associated with higher odds of experiencing frequent headaches or migraines with a standard deviation change in PTSD score corresponding to over twice the odds (95% confidence interval [1.64, 2.68]) of having trouble with frequent headaches or migraines in the postKatrina period. Each additional point on the intrusion subscale (sample M [SD] 1.6 [1.1]) was associated with 55% higher odds of reporting frequent headache/migraine (95% confidence interval [1.03, 2.33]), but we found no association with avoidance or hyperarousal symptoms. Clinicians and disaster planners should be aware that disaster survivors might be at heightened risk of migraine/headache episodes, and those experiencing intrusive reminders may be most affected.

Clinicians considering whether to adopt PTSD screening for their patients should be aware that PTSD symptoms were associated with headaches or migraines in an all-female sample as well. A second implication of our findings is that clinicians might consider paying particular attention to intrusive PTSD symptoms as risk factors for headache or migraine problems. With natural disasters expected to increase in frequency and severity due to global climate change (Van Aalst, 2006), researchers should continue to explore the wide-reaching and synergistic mental and physical health consequences of disasters.

Graif, C. (2016). (Un)natural disaster: Vulnerability, long-distance displacement, and the extended geography of neighborhood distress and attainment after Katrina. *Population and Environment*,

After Hurricane Katrina, socioeconomically vulnerable populations were slow to return to their poor and segregated pre-disaster neighborhoods. Yet, very little is known about the quality of their post-disaster neighborhoods. While vulnerable groups rarely escape neighborhood poverty, some Katrina evacuees showed signs of neighborhood improvement. The current study investigates this puzzle and the significance of long-distance moves for neighborhood change among participants in the Resilience in the Survivors of Katrina Project. The findings show that respondents' immediate and extended neighborhoods and metropolitan areas after Katrina were less disadvantaged, less organizationally isolated, and more racially and ethnically diverse compared to their pre-hurricane environments, and to the environments of those staying or returning home. Counterfactual analyses showed that more than within-neighborhood changes over time, between-neighborhood mobility and long-distance migration decreased respondents' exposures to distress in their neighborhood, extended geographic area, and metropolitan area.

Because of global warming, hurricanes of Katrina-like intensity occur twice as often compared to a few decades ago. Before the end of the century, this number may double again (Holland 2012). The findings here contribute to understanding postdisaster displacement by uncovering locational gains among a sample of vulnerable families displaced by Katrina. Broadly, the robust improvements in neighborhoods and broader spatial contexts found here suggest that the neighborhood poverty traps in which many vulnerable families find themselves (Crowder and South 2005; *Popul Environ* (2016) 37:288–318 Sampson and Sharkey 2008; Sharkey 2012) may be escaped through long-distance moves. Such gains are surprising from the constrained residential mobility standpoint, but are consistent with the migration scholarship, as long-distance migration has been historically associated with greater returns. The results advance our understanding of spatial mobility pathways among disadvantaged minority evacuees and integrate core insights from the scholarships on post-disaster migration, vulnerability, environmental effects, and residential stratification. The decreases in neighborhood poverty found here parallel those observed in voluntary residential mobility programs like the MTO and suggest that refining such programs to encourage long-distance moves may contribute to broader neighborhood gains. The findings also suggest that in order to help socioeconomically vulnerable survivors of environmental hazards retain their neighborhood gains and translate them into further benefits (Kirk 2009; Sharkey and Sampson 2010), future programs would do well to (a) prepare movers to capitalize on new resources at different geographic scales, from their immediate and extended neighborhoods to their metro area (and relatedly, assist with public or private transportation access); (b) expand housing access and affordability (Fussell and Harris 2014); (c)

strengthen communication between movers and groups with different cultural norms in receiving areas; (d) mitigate the disaster's psychological and financial tolls (Asad 2014; Bourque et al. 2006); and (e) Help evacuees overcome employment obstacles, from interrupted education, discrimination, disrupted networks, to prohibitive childcare costs.

<p>Asad, A. L. (2015). Contexts of reception, post-disaster migration, and socioeconomic mobility. <i>Population and Environment</i>.</p>	<p>Current theories conceptualize return migration to New Orleans after Hurricane Katrina as an individual-level assessment of costs and benefits. Since relocation is cost prohibitive, return migration is thought to be unlikely for vulnerable populations. However, recent analyses of longitudinal survey data suggest that these individuals are likely to return to New Orleans over time despite achieving socioeconomic gains in the post-disaster location. I extend the “context of reception” approach from the sociology of immigration and draw on longitudinal data from the Resilience in the Survivors of Katrina Project to demonstrate how institutional, labor market, and social contexts influence the decision to return. Specifically, I show how subjective comparisons of the three contexts between origin and destination, perceived experiences of discrimination within each context, and changing contexts over time explain my sample’s divergent migration and mobility outcomes. I conclude with implications for future research on, and policy responses to, natural disasters.</p>	<p>Understanding how vulnerable individuals’ experiences with post-disaster institutional, labor market, and social contexts shape whether and how they decide to return migrate is essential for scholars and policymakers interested in these communities’ long-term resettlement and recovery trajectories. As we have seen, vulnerable populations rely upon a combination of positive experiences with institutional, labor market, and social contexts in origin and destination, rendering individualistic approaches to disaster recovery insufficient (Myers et al. 2008). Instead, as Eva explained, a more comprehensive approach to disaster relief encompassing these three contextual dimensions is important. A holistic strategy—in Eva’s case, assistance to buy a home (institutional), access to a quality job (labor market), and feeling “at home” in the post-disaster location (social)—is not only likely to facilitate survivors’ recovery in the shortterm but also promote long-term mobility outcomes.</p>
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Chan, C. S., Lowe, S. R., Weber, E. & Rhodes, J. E. (2015). The contribution of pre- and postdisaster social support to short- and long-term mental health after Hurricanes Katrina: A longitudinal study of low-income survivors. *Social Science & Medicine*

A previous study of Hurricane Katrina survivors found that higher levels of predisaster social support were associated with lower psychological distress one year after the storm, and that this pathway was mediated by lower exposure to hurricane-related stressors. As a follow-up, we examined the impact of pre- and postdisaster social support on longer-term of mental health both psychological distress and posttraumatic stress. In this three-wave longitudinal study, 492 residents in the region affected by Hurricane Katrina reported levels of perceived social support and symptoms of psychological distress prior to the storm (Wave 1). Subsequently, one year after Hurricane Katrina (Wave 2), they reported levels of exposure, perceived social support, and symptoms of psychological distress and posttraumatic stress. The latter three variables were assessed again four years after the hurricane (Wave 3). Results of mediation analysis indicated that levels of exposure to hurricane-related stressors mediated the relationship between Wave 1 perceived social support and Wave 3 psychological distress as well as postdisaster posttraumatic stress. Results of regression analyses indicated that, controlling for Wave 1 psychological distress and disaster exposure, Wave 2 perceived social support was associated with Wave 2 and Wave 3 psychological distress but not posttraumatic stress. Our results confirmed the social causation processes of social support and suggest that posttraumatic stress might not stem directly from the lack of social support. Rather, preexisting deficits in social resources might indirectly affect longer-term posttraumatic stress and general psychological distress by increasing risk for disaster-related stressors.

Despite these limitations, this study provides evidence that higher levels of postdisaster perceived social support continued to be associated with lower levels of GPD four years after a major natural disaster. Additionally, the mediational pathway from predisaster perceived social support to postdisaster psychological functioning applies to both GPD and PTS at one- and four-year postdisaster. These results show that predisaster social support has a broad and long-term influence on postdisaster mental health outcomes, although its influence is not always direct. To help attenuate the detrimental impact of natural disasters, practitioners and policymakers should seek ways to solidify social support in the community both before and after a disaster.



Deterding, N. (2015). Instrumental and expressive education: College planning in the face of poverty. *Sociology of Education*

Nearly all young people in the United States aspire to a college degree, but many fail to complete college in a timely manner. Does this lack of attainment reflect abandoned college plans? I analyze mixed-methods data from a five-year study of 700 low-income mothers at two Louisiana community colleges. Hurricane Katrina displaced respondents and interrupted their college educations; respondents had to decide whether, how, and why to return to school. Few women earned degrees during the study, but survey data indicate that the rate of reenrollment and intentions to complete were high. Interview data reveal the cultural logics supporting continued plans for a return to college. Instrumentally, respondents believed education would result in better employment. Expressively, the moral status afforded students supported respondents' narratives of upward mobility despite the difficulties they faced. The logic of human capital investment dominates policy and academic discussions of education's value, but I find the symbolic meaning of a college degree also shapes plans for college return and college decision making long into adulthood. Plans to return persist long beyond the objective probability of earning a degree, and despite respondents' difficult experiences, due to the expressive value college plans add to these young women's lives

My work could serve as the basis for several fruitful avenues of future research. While the logic of human capital investment dominates policy—and increasingly academic—discussions of education's value, disadvantaged students themselves tell us that other reasoning factors into their decision making. Clearly, as long argued by Rosenbaum and colleagues (2006), many students—like Tina, Cherise, and Tonya—could benefit from a better understanding of the likely outcomes and consequences of their enrollment decisions. At the same time, a better understanding of what is at stake—both materially and symbolically—as students process this information may reveal important limitations to policies and practices that simply provide “better information.” Future comparative research should also examine whether the symbolic meaning of college education varies across students of different backgrounds who have access to different resources. The symbolic meaning of educational decisions will likely reveal much about the U.S. opportunity structure more broadly.

Lowe, S. R., Rhodes, J. E. & Waters, M. C. (2015). Understanding resilience and other trajectories of psychological distress: A mixed-methods study of low-income mothers who survived Hurricane Katrina. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*.

Recent longitudinal studies in the aftermath of natural disasters have shown that resilience, defined as a trajectory of consistently low symptoms, is the modal experience, although other trajectories representing adverse responses, including chronic or delayed symptom elevations, occur in a substantial minority of survivors. Although these studies have provided insight into the prototypical patterns of postdisaster mental health, the factors that account for these patterns remain unclear. In the current analysis, we aimed to fill this gap through a mixed-methods study of female participants in the Resilience in Survivors of Katrina (RISK) study. Latent class growth analysis identified six trajectories of psychological distress in the quantitative sample (n=386). Qualitative analysis of in-depth interviews with 54 participants identified predisaster, disaster-related and postdisaster experiences that could account for the trends in the quantitative data. In particular, preexisting and gains in psychosocial resources (e.g., emotion regulation, religiosity) and positive postdisaster impacts (e.g., greater neighborhood satisfaction, improved employment opportunities) were found to underlie resilience and other positive mental health outcomes. Conversely, experiences of childhood trauma, and pre and postdisaster stressors (e.g., difficulties in intimate partner relationships) were common among participants in trajectories representing adverse psychological responses. Illustrative case studies that exemplify each trajectory are presented. The results demonstrate the utility of mixed-methods analysis to provide a richer picture of processes underlying postdisaster mental health.

The results of the study show the utility of triangulating trajectory analysis with qualitative case studies. As in our quantitative analysis, statistical models that best represent the data can yield psychological trajectories with few participants, limiting statistical power to determine which factors might account for these patterns. Furthermore, quantitative analysis is necessarily limited by the measures included in a given study, as well as the measures available to assess a given construct. By supplementing our quantitative analysis with qualitative case studies, we identified several additional risk and protective factors that could be explored in further research. Additionally, the case studies provided richer information about how risk and protective factors operated mechanistically in participants' lives to shape mental health and other outcomes. Clinically, the results demonstrate the importance of taking a life course perspective to understand disaster survivors' presenting problems (Cherry 2009). It was clear from our analysis that sources of participants' distress were not limited to the period during Katrina and its initial aftermath and that, for some participants, the hurricane led to the opportunity to access mental health services for the first time, leading to alleviation of symptoms that were present prior to the disaster. In addition to helping patients overcome predisaster and disaster-related traumatic experiences, clinicians could assess and attend to difficulties in survivors' interpersonal relationships, especially those with intimate partners, and help them identify resources to alleviate postdisaster stressors. Efforts to build survivors' coping skills and identify new opportunities in the postdisaster environment could also facilitate positive psychological outcomes.

Bosick, S. (2015). "Pushed out on my own": The impact of Hurricane Katrina in the lives of low-income emerging adults. *Sociological Perspectives*.

The literature would predict that the loss of these important supports would hinder the respondents' transition-to-adulthood experiences. To the contrary, those who relocated away from social ties were more likely than those who returned to report qualitative improvement across life domains. Relocators credited Hurricane Katrina with affording them structural opportunities that lead to a greater sense of independence, a fundamental component of adulthood. This work contributes to our theoretical understanding of the role of familial support during the transition to adulthood. Despite the expectation that these women would suffer greatly from Katrina's disruption to their social ties, those who were still living away from these supports at the time they were interviewed reported qualitative improvement across life domains. They touted better employment opportunities, stronger educational programs, safer schools and neighborhoods for their children, and more independent living circumstances than they had prior to the storm. In short, our respondents reported greater independence, which, consistent with Arnett (2004), they viewed as a fundamental requirement of adulthood. The women saw themselves, not as passive players, but as effective actors seizing opportunities that led them to feel more accomplished and self-reliant. They felt that the decision to relocate outside of New Orleans was responsible for this positive turn in their lives. They viewed their fresh independence and improved structural opportunities as incompatible with returning to their New Orleans-based networks.

The findings imply a paradox in which the social ties upon which low-income mothers rely as they transition to adulthood may undermine their independence, a value they espouse as fundamental to adulthood. The geographically fixed nature of this familial support often takes the form of dependent living arrangements and conflicts with their ability to pursue opportunities in other geographic locations. This highlights an important disparity between the forms of support available to transitioners from lower income versus higher income families. The findings further contribute to a growing literature on the drawbacks of prolonged parental support during the transition to adulthood (Hamilton 2013; Johnson 2013). Still, the findings suggest that it is possible and useful to facilitate exploration by vulnerable populations during the transition to adulthood. Promoting semiautonomous living situations for students with children may offer such emerging adults a fresh context in which to pursue alternative lifestyles and explore new possibilities for upward mobility. Providing subsidized daycare at our community colleges and universities may also help to decrease the reliance on familial social ties. Furthermore, it would be useful to expose vulnerable populations to educational and occupational trajectories that might otherwise fall outside their view of life possibilities. Building more institutionalized routes from education to employment would also allow these populations to envision unfamiliar careers as tangible possibilities. At the same time, it is important to consider ways to provide these institutional supports without undermining the familial bonds. Vulnerable populations should not have to choose between opportunity and social ties.

Lowe, S.R, Willis, M & Rhodes, J. (2014). Health Problems among Low-Income Parents in the Aftermath of Hurricane Katrina. *Health Psychology*

The mental and physical health effects of exposure to traumatic events during the hurricane persist over time. More specifically, rates of physical illnesses rose sharply and persisted for several years after Hurricane Katrina, with migraines, headaches, and back problems more common than digestive problems. Indeed, the proportion of respondents experiencing migraines increased by nearly 40% over the four waves of data collection, from 16% at baseline to 54% at the second post-Katrina wave. Importantly, these rates are much higher than that of women in the general population (20%). Additionally, those who experienced more psychological distress were at higher risk of developing chronic health problems. Bereavement also significantly increased the odds of developing each problem, such that participants who experienced bereavement were 3.23 times more likely to develop migraines, 2.99 times more likely to develop digestive problems, and 2.50 times more likely to develop back

Besides mental health, disasters also take a significant toll on survivors' physical health for many years after the event. As such, crisis and post-disaster medical units should screen for physical health conditions in addition to psychological distress, especially among survivors who have experienced bereavement. Disaster survivors, in particular those from ethnic minority groups, might also be more likely to present with common physical health problems rather than psychological distress; by assessing health problems, practitioners might be able identify survivors at risk for psychological symptoms and in need of mental health services. Furthermore, since many survivors of disasters come into contact with service agencies (e.g., FEMA, non-profit organizations) after a disaster, the events might provide unique opportunities to detect latent health problems and to offer or refer to treatment. Stronger connections among services agencies and health providers are needed to facilitate appropriate referrals. The majority of low-income adults in the United States with health problems and serious mental illness do not receive adequate care (Wang, Demler, & Kessler, 2002; Young, Klap, Sherbourne, & Wells, 2001). Redressing the structural barriers that impede service use among this group is especially important (Miranda & Green, 1999).

Calvo, R., Arcaya, M., Baum, C. F., Lowe, S. R. & Waters, M. C. (2014). Happily ever after? Pre and post disaster determinants of happiness among survivors of Hurricane Katrina. *Journal of Happiness Studies*

We found that happiness significantly decreased from pre-disaster to 1 year post-disaster but there were no significant differences in happiness between the pre-disaster and 4 years post-disaster assessments. An exception were 38 women who continued to have lower levels of happiness 4 years post-disaster than at pre-disaster. These women were more likely to be living on their own after the storm and reported consistently lower levels of perceived social support from the community both before and after the storm than the other women of the sample. Factors associated with the survivor's happiness after the storm included exposure to hurricane stressors and losing a loved one to the hurricane. These were predictive of lower happiness 1 year post-disaster. Four years after the hurricane only exposure to hurricane stressors was predictive of lower levels of happiness. In contrast, pre-disaster happiness and post-disaster social support were protective against the negative effect of the hurricane on survivors' happiness. Women's happiness decreased and remained low for at least 1 year following Hurricane Katrina. 4 years later, however, most women had regained their pre-Katrina levels of happiness. These findings confirm previous studies that observed that the initial low levels of happiness reported by survivors of natural disasters increased as time from the catastrophe passed (Luechinger and Raschky 2009; Papanikolau et al. 2012). An exception to this general pattern were 38 women who presented higher levels of happiness prior to the hurricane but remained in the lower categories of happiness 4 years after the storm. These women were more likely than the rest of the sample to live alone after the storm and reported consistently lower levels of perceived social support from the community than the rest of the cohort both before and after the storm.

Despite these limitations, our results highlight the importance of facilitating interventions that improve the social support of victims of natural disasters to prevent long-term declines in happiness. In addition, very few studies have examined happiness adaptation to exogenous life events with prospective longitudinal data. By monitoring individuals' happiness before and after the occurrence of a natural disaster, our study goes beyond previous research on the effect of natural disasters in happiness.

Fussell, E. & Lowe, S. R. (2014). The impact of housing displacement on the mental health of low-income parents after Hurricane Katrina. *Social Science and Medicine*

Using latent profile analysis, we demonstrated three profiles of displacement experiences within the sample: (1) returned, characterized by return to a predisaster community; (2) relocated, characterized by relocation to a new community, and (3) unstably housed, characterized by long periods in temporary housing and multiple moves. Using regression analyses, we assessed the relationship between displacement profiles and three mental health outcomes (general psychological distress, posttraumatic stress, and perceived stress), controlling for predisaster characteristics and mental health indices and hurricane-related experiences. Relative to participants in the returned profile, those in the relocated profile had significantly higher general psychological distress and perceived stress, and those in the unstably housed profile had significantly higher perceived stress. Based on these results, we suggest interventions and policies that reduce postdisaster housing instability and prioritize mental health services in communities receiving evacuees. Our results support our contention that displacement weakens survivors' capacities to conserve resources by revealing that participants with returned profiles show lower levels of distress and perceived stress compared to those in relocated and unstably housed profiles. It is possible that the pathways to poorer mental health outcomes were qualitatively different between relocated and unstably housed profiles, although this did not produce significant differences in the level of distress and perceived stress.

The linkage between displacement and mental health we find in our sample of low-income, mostly non-Hispanic Black mothers underscores the importance of effective postdisaster sheltering and housing restoration policies, especially for this vulnerable group. Post-Katrina sheltering practices exposed the inadequacies of current policies for sheltering large numbers of displaced residents for prolonged periods and for repairing affordable rental property in the disaster affected community (Nigg et al., 2006; US GAO, 2010). Indeed, repeated extensions of temporary housing assistance increased anxiety and stress among those who depended on it (Lein et al., 2012). Our results demonstrate this relationship. Finally, the results indicate the need for mental health services for relocated and unstably housed disaster survivors. Practitioners could forge connections with unstably housed survivors by connecting with disaster housing assistance programs and social service agencies working with survivors. Additionally, clinicians in communities receiving disaster survivors could avail themselves to the displaced. A greater understanding of the secondary stresses associated with resettlement and unstable housing would guide practitioners in exploring areas of stress not fully recognized in disaster-affected patients and facilitate individuals' disaster recovery.

<p>Chan, C. S. &amp; Rhodes J. E. (2014). Measuring exposure in Hurricane Katrina: A meta-analysis and an integrative data analysis. PLoS ONE</p>	<p>To date there is no consensus on the operationalization of exposure severity in the study of the impact of natural disasters. This is problematic because incomplete and inconsistent measurement of exposure limits the internal and external validity of disaster studies. The current paper examined the predictive validity of severity measures in two interrelated studies of Hurricane Katrina survivors. First, in a meta-analysis of eight studies that measured both exposure severity and posttraumatic stress, the effect size was estimated to be <math>r = .266</math>. The moderating effects of sample and study characteristics were examined and we found that minority status and number of stressors assessed were significant moderators. Second, in an integrative data analysis of five independent samples of Hurricane Katrina survivors, the impact of specific disaster-related stressors on mental health was compared. Threat to physical integrity of self and others were found to have the strongest association with posttraumatic stress (PTS) and general psychological distress (GPD). The lack of basic necessities, such as food, water, and medical care, and loss of pet were also found to be strongly associated with both PTS and GPD. The results from the two studies are integrated and their implication for disaster research and relief are discussed.</p>	<p>These findings reinforce the importance of providing necessities and medical care, as well as accommodation for pets, if possible, in the aftermath of a disaster. In looking at the data reported in the published reports we examined, we recommend that future studies strive to include bivariate associations to facilitate systemic review and metaanalysis. Our findings indicate that they should also consider using composite scores of exposure severity with caution, given that there is great variability in the impact of each DRS. It might be advisable to separate different types of DRS and to include relatively understudied but evidently significant stressors such as pet loss. The use of objective measures might also help complement the subject self-report events.</p>
<p>Arcaya, M. C., Lowe, S. R., Rhodes, J. E., Waters, M. C. &amp; Subramanian, S. V. (2014). Association of PTSD symptoms with asthma attacks among Hurricane Katrina survivors. Journal of Traumatic Stress.</p>	<p>The relationship between posttraumatic stress disorder (PTSD) and asthma in the wake of natural disasters is poorly understood. Using pre- and postdisaster data (<math>N = 405</math>) from the Resilience in Survivors of Katrina (RISK) project, we examined associations between PTSD symptoms, measured by the Impact of Event Scale-Revised (IES-R), and self-reported postdisaster asthma attacks. A 1-point increase in the IES-R avoidance score, which corresponded to one standard deviation change in this sample, was associated with double the odds of reporting an asthma attack or episode since the hurricane, 95% CI Revised spacing among characters: [1.22, 4.16]. Association with</p>	<p>Despite limitations, our results may help inform postdisaster health services delivery and predisaster mitigation planning; clinicians and disaster planners should be aware that demand for asthma-related health care may rise among survivors, as suggested by previous research (Ohkouchi et al., 2013; Rath et al., 2011), and that those experiencing PTSD avoidance symptoms may be at particular risk.</p>

hyperarousal and intrusion symptoms was null. Further research using objective measures of asthma morbidity is needed; nevertheless, these findings may help inform postdisaster health services delivery and predisaster mitigation planning.

Arcaya, M., James, P., Rhodes, J. E., Waters, M. C. & Subramanian, S. V. (2014). Urban sprawl and body mass index among displaced Hurricane Katrina survivors. *Preventive Medicine*.

Respondents from 8 New Orleans-area counties were dispersed to 76 counties post-Katrina. Sprawl increased by an average of 1.5 standard deviations (30 points) on the county sprawl index. Each one point increase in sprawl was associated with approximately .05 kg/m<sup>2</sup> higher BMI in unadjusted models (95%CI: .01–.08), and the relationship was not attenuated after covariate adjustment. Conclusions: We find a robust association between residence in a sprawling county and higher BMI unlikely to be caused by self-selection into neighborhoods, suggesting that the built environment may foster changes in weight. Among a displaced population, relocation to a more sprawling area was associated with higher BMI. The average increase in sprawl experienced by displaced RISK participants corresponds to a 4.3 kg weight gain for 1.7 m tall individuals. At a height of 1.7 m and a baseline BMI at the sample's mean of 28.8, this change represents a 5% increase in body weight. Although our observational data do not allow us to rule out endogeneity as an explanation, the association does not appear to be driven by self-selection into more sprawling counties, nor confounded by differences in economic outcomes for residents of sprawling versus more urban areas.

In the context of disaster research, we note that post-disaster planning should consider how evacuees can access neighborhoods that support health. More broadly, these findings add to a growing evidence base that the built environment can foster changes in weight, underscoring the need to integrate health into public dialogue about land use planning. Zoning laws, subdivision regulations, and other policies that regulate land use and development may have the power to help to slow, and potentially reverse, the tide of the obesity epidemic.



Fussell, E. & Harris, E. (2014). Homeownership and vulnerability to housing displacement after Hurricane Katrina. *Social Science Quarterly*.

Among low-income African-American mothers, homeowners' odds of being in their pre-Katrina home rather than a new home are greater than those of renters, while renters' odds of being in a pre-Katrina home are greater than those of subsidized housing residents, *ceteris paribus*. The difference in homeowners' and renters' odds is reduced to insignificance when access to private insurance is added to the model, although the difference for subsidized housing residents remains. Homeownership and disaster assistance protect against housing displacement. Renters, especially those in subsidized housing, were more vulnerable to housing loss after this disaster. This bolsters the contention that there is a homeowner bias in housing recovery policies (Comerio 1998; Zhang and Peacock 2010). In contrast, renters were more likely to be in new homes, which were often located outside of the city and sometimes the state. Residents of Section 8 and public housing were even more likely to be in new homes than market renters.

By identifying how pre-Katrina housing tenure affects postKatrina housing type both directly (through differences in legal rights to a home) and indirectly (through access to private insurance) this research provides empirical support for the argument that housing tenure and housing recovery policies are associated with unequal vulnerability to housing displacement after a disaster.

Arcaya, M. C., Subramanian, S. V., Rhodes, J. E. & Waters, M. C. (2014). Role of health in predicting moves to poor neighborhoods among Hurricane Katrina survivors. *Proceedings of the National Academy of Sciences*.

We use prospectively collected data on 569 poor, predominantly African American Hurricane Katrina survivors to examine the extent to which health problems predicted subsequent neighborhood poverty. Our outcome of interest was participants' 2009–2010 census tract poverty rate. Participants were coded as having a health problem at baseline (2003–2004) if they self-reported a diagnosis of asthma, high blood pressure, diabetes, high cholesterol, heart problems, or any other physical health problems not listed, or complained of back pain, migraines, or digestive problems at baseline. Although health problems were not associated with neighborhood poverty at baseline, those with baseline health problems ended up living in higher poverty areas by 2009–2010. Differences persisted after adjustment for personal characteristics, baseline neighborhood poverty, hurricane exposure, and residence in the New Orleans metropolitan area, with baseline health problems predicting a 3.4 percentage point higher neighborhood poverty rate (95% confidence interval: 1.41, 5.47). Results suggest that better health was protective against later neighborhood deprivation in a highly mobile, socially vulnerable population. Researchers should consider reciprocal associations between health and neighborhoods when estimating and interpreting neighborhood effects on health. Understanding whether and how poor health impedes poverty deconcentration efforts may help inform programs and policies designed to help low-income families move to—and stay in—higher opportunity neighborhoods.

Notwithstanding these limitations, demonstrating evidence of health selection into residential areas following a shock helps to inform research and policy. Although we conceptualize a dynamic interplay between neighborhood and health over time, a unidirectional interest in neighborhood effects on health currently dominates the literature. Studies in this realm should at least consider reciprocal associations between health and neighborhoods when estimating and interpreting effect estimates of neighborhood characteristics on health outcomes. From a policy perspective, new strategies to tackle concentrated poverty are sorely needed, and direct investments in health may help to interrupt longstanding relationships among poor places, poor people, and poor health. More evidence on mechanisms linking health to subsequent neighborhood attainment would be critical to planning such investments, although testable pathways include reluctance to move away from social ties who help with childcare and other caretaking, minimizing housing payments in response to the threat of unplanned health-related costs or lost wages, and reduced “bandwidth” available to seek out new neighborhoods while coping with health problems (34). A different perspective on causal pathways asks what factors at the neighborhood level actively draw sicker versus healthier residents. In other words, it is not just that residents seek neighborhoods, but that neighborhoods also seek residents (35). Further investigation is needed into which structural aspects of urban ineq

Dunn, E. C., Solovieff, N., Lowe, S. R., Gallagher, P. J., Chaponis, J., Rosand, J., Koenen, K. C., Waters, M., Rhodes, J. & Smoller, J. W. (2014). Interaction between genetic variants and exposure to Hurricane Katrina on post-traumatic stress and post-traumatic growth: A prospective analysis of low income adults. *Journal of Affective Disorders*

Gene-environment interaction (GxE) studies could offer new insight into the factors underlying variability in post-disaster psychological responses. However, few studies have explored GxE in a disaster context. We examined whether ten common variants in seven genes (BDNF, CACNA1C, CRHR1, FKBP5, OXTR, RGS2, SLC6A4) modified associations between Hurricane Katrina exposure and PTS and PTG. Data were from a prospective study of 205 low-income non-Hispanic Black parents residing in New Orleans prior to and following Hurricane Katrina. Results—We found a significant association (after correction) between RGS2 (rs4606;  $p=0.0044$ ) and PTG, which was mainly driven by a cross-over GxE ( $p=0.006$ ), rather than a main genetic effect ( $p=0.071$ ). The G (minor allele) was associated with lower PTG scores for low levels of Hurricane exposure and higher PTG scores for moderate and high levels of exposure. We also found a nominally significant association between variation in FKBP5 (rs1306780,  $p=0.0113$ ) and PTG, though this result did not survive correction for multiple testing. Limitations—Although the inclusion of low-income non-Hispanic Black parents allowed us to examine GxE among a highly vulnerable group, our findings may not generalize to other populations or groups experiencing other natural disasters. Moreover, not all participants invited to participate in the genetic study provided saliva. To our knowledge, this is the first study to identify GxE in the context of posttraumatic growth. Future studies are needed to clarify the role of GxE in PTS and PTG and postdisaster psychological responses, especially among vulnerable populations.

In summary, our results suggest that RGS2 plays a role in PTG. Future studies are needed to understand which genetic as well as social and psychological determinants explain the variation in response to natural disasters and which populations are most vulnerable (or resilient) to developing PTSD and experiencing PTG following exposure to trauma.

Lowe, S.R., Manove, E., & Rhodes, J., (2013). Posttraumatic Stress and Posttraumatic Growth Among Low-Income Mothers who Survived Hurricane Katrina. *Journal of Consulting and Clinical Psychology*

Post Traumatic Stress (PTS), assessed at both one and three years after Hurricane Katrina, was significantly and positively associated with Post Traumatic Growth (PTG), assessed at three years post-disaster. Additionally, survivors with probable PTSD at each time point, as indicated by clinical cutoff scores, reported significantly higher levels of PTG. Also, women with higher predisaster distress had significantly higher post-disaster PTS.

Particularly in light of the persistent PTSD among many survivors, these results highlight the need for disaster preparedness efforts that minimize exposure to hurricane-related stressors, including plans for evacuation via public transportation, guidelines for what conditions necessitate a mandatory evacuation, and means for enforcing such mandates. Policies that ensure that adequate medical care and necessary medications are available during disasters might also prevent disaster-related fatalities and the psychological toll of bereavement. Efforts in the aftermath of disasters to connect survivors with affordable mental health services, particularly those with pre-existing mental health conditions and those who have faced high levels of hurricane exposure, would help to prevent posttraumatic stress reactions. Once affected survivors are identified, mental health practitioners should strive to employ culturally sensitive and empirically supported interventions to both reduce PTS and promote PTG. Meaning-making interventions would also enhance survivors' optimism and purpose, promoting positive psychological outcomes

Lowe, S.R., & Rhodes, J. (2013). Trajectories of psychological distress among low-income, female survivors of Hurricane Katrina. *American Journal of Orthopsychiatry*.

Over half of the survivors' fit into a trajectory consistent with resilience; that is, they maintained low levels of psychological distress over the course of the study, but experienced an elevation in symptoms at the first pre-disaster time point followed by a return to pre-disaster levels by PK2. The other trajectories reflected a range of psychological responses to disasters, and indicated that predisaster functioning had a major influence on post-disaster psychological outcomes. Degree of exposure to hurricane-related stressors, social support, and socioeconomic status were significant predictors of trajectory group membership.

Pre-disaster levels of psychological distress had a clear influence on post-disaster psychological trajectories. Pre-disaster data provides insight into how natural disasters alter the developmental course of psychological symptoms, particularly if multiple data points have been collected. The results also provide support for group-based statistical approaches. Although a resilient trajectory represented the majority of the sample, there were clear subgroups of participants that deviated from this pattern. With traditional latent growth curve modeling, we would have overlooked participants with consistent distress and delayed responses, as well as those who experienced improvements in functioning in the post-disaster period. The psychological trajectories have implications for post-disaster clinical interventions. Slight elevations in psychological symptoms should be normalized, and communities exposed to disaster should be informed that these symptoms often occur in mild forms (e.g., with low levels of frequency and intensity) and, in most instances, dissipate over time. At the same time, psycho-educational interventions should provide information on what individuals can do in the event of more intense, persistent psychological symptoms. Additionally, the findings of the study demonstrate that not all survivors are equally vulnerable to post-disaster psychological distress, and suggest factors predictive of adverse reactions (e.g., higher pre-disaster psychological symptoms, lower social support). Screening for these factors could help practitioners identify survivors that might be in particular need of mental health services, to whom they could deploy empirically supported treatments, address grief responses to human and pet bereavement, and bolster social support networks. Disaster policies should likewise include measures for protecting individuals suffering from psychological distress from disaster exposure, including those ensuring

timely evacuation, food and shelter during the storm and its aftermath, and access to medicine and medical care. Including means for evacuating pets and reuniting survivors with their animals could also protect against distressing symptoms. Lastly, policies that promote the long-term financial stability of low-income survivors, including diverse training and educational opportunities, increased earnings, affordable childcare, and enforcement of anti-discrimination laws, could help promote the long-term psychological adjustment of low-income survivors.

Lowe, S. R., Godoy, L., Rhodes, J., & Carter, A. (2013). Predicting Mothers' Reports of Children's Mental Health Three Years after Hurricane Katrina. *Journal of Applied Developmental Psychology*

Exposure was associated with increased maternal psychological distress and increased school mobility in the first post-disaster year. Three years post-disaster, exposure was also associated with child's internalizing and externalizing symptoms indirectly, through their impact on maternal psychological distress.

The results suggest the importance of practices that bolster schools and families' readiness for disasters. This might include additional means for reaching out to parents and tracking students in the aftermath of disasters, both to ensure that students are connected with new schools and to foster communication amongst students, teachers, counselors, and other school personnel during transitions. Students who maintain some connection to their former school might feel supported even as they enter a new school and community. To the extent possible, post-disaster policies should prioritize and facilitate temporary locations for damaged schools, and planning for their reconstruction. Policies that promote the long-term stability of low-income families, who are particularly likely to face a large number co-occurring stressors, in the aftermath of disasters would also protect against frequent school transitions and psychological distress (Yoshikawa et al., 2012). The results suggest that children who change schools frequently in the aftermath of disasters would be appropriate targets for mental health services. Routine screening of new students for mental health problems would help identify children in need, and identified children could receive counseling services during the school day. Schools represent an ideal setting for screening and the provision of psychological services for children in the aftermath of disasters, given that they are a common point of entry, provide services for children with mental health needs, and that they can serve as "nurturing environments." Give this role, schools could help foster prosocial behaviors and help to prevent mental health problems. Mental health services for low-income mothers in the aftermath of disasters could also offset the impact of disasters on the psychological functioning of children; practitioners could connect with mothers through the their children's school or through religious communities, housing

developments, social service agencies, and community health centers to provide support and advocacy. Finally, clinicians should take into account structural barriers that often prevent low-income mothers from receiving services, including lack of insurance, childcare, and transportation (Miranda & Green, 1999).

Chan, C. & Rhodes, J. (2013). Religious coping, posttraumatic stress, psychological distress, and posttraumatic growth among female survivors four years after Hurricane Katrina. *Journal of Traumatic Stress.*

Results from structural regression modeling indicated that negative religious coping was associated with psychological distress, but not PTS. Positive religious coping was associated with PTG. Further analysis indicated significant indirect effects of pre- and postdisaster religiousness on postdisaster PTG through positive religious coping. Findings underscore the positive and negative effect of religious variables in the context of a natural disaster.



Lowe, S. R., Manove, E. E., & Rhodes, J. E. (2013). Posttraumatic stress and posttraumatic growth among low-income mothers who survived Hurricane Katrina. *Journal of Consulting and Clinical Psychology*

**Objective**—The purpose of the study was to explore the relationship between posttraumatic stress (PTS) and posttraumatic growth (PTG) after Hurricane Katrina, and the role of demographics, pre-disaster psychological distress, hurricane-related stressors, and psychological resources (optimism and purpose) in predicting each. **Method**—Participants were 334 low-income mothers (82.0% non-Hispanic Black) living in the New Orleans area prior to Hurricane Katrina, who completed surveys in the year prior to the hurricane (T1), and one and three years thereafter (T2 and T3). **Results**—Higher T2 and T3 PTS full-scale and symptom cluster subscales (intrusion, avoidance, and hyperarousal) were significantly associated with higher T3 PTG, and participants who surpassed the clinical cut-off for probable PTSD at both T2 and T3 had significantly higher PTG than those who never surpassed the clinical cut-off. Older and non-Hispanic Black participants, as well as those who experienced a greater number of hurricane-related stressors and bereavement, reported significantly greater T3 PTS and PTG. Participants with lower T2 optimism reported significantly greater T3 intrusive symptoms, whereas those with higher T1 and T2 purpose reported significantly greater T3 PTG. **Conclusions**—Based on the results, we suggest practices and policies that identify disaster survivors at greater risk for PTS, as well as longitudinal investigations of reciprocal and mediational relationships between psychological resources, PTS, and PTG.

Particularly in light of the persistent PTS among many survivors, these results highlight the need for disaster preparedness efforts that minimize exposure to hurricane-related stressors, including plans for evacuation via public transportation, guidelines for what conditions necessitate a mandatory evacuation, and means for enforcing such mandates. Policies that ensure that adequate medical care and necessary medications are available during disasters might also prevent disaster-related fatalities and the psychological toll of bereavement. Efforts in the aftermath of disasters to connect survivors with affordable mental health services, particularly survivors with pre-existing mental health conditions and those who have faced high levels of hurricane exposure, would help to prevent posttraumatic stress reactions. Once affected survivors are identified, mental health practitioners should strive to employ culturally sensitive and empirically supported interventions to reduce PTS, including cognitive behavioral therapy (CBT) and prolonged exposure (PE) therapy (Hobfoll et al., 2007b). Meaning-making interventions could also enhance survivors' sense of optimism (Lee, Cohen, Edgar, Laizner, & Gagnon, 2006), potentially alleviating intrusive symptoms. It is less clear whether practitioners should encourage PTG in trauma survivors. Although there is some evidence that successful cognitive behavioral treatment (CBT) could lead to meaningful change in PTG (Knaevelsrud, Liedl, & Maercker, 2010; Zoellner, Rabe, Karl & Maercker, 2011), less is known about its relation to indices of psychological health or behavioral changes. As Zoellner and colleagues (2011) note, however, the body of literature suggests that increases in PTG can occur independent of declines in distress, perhaps reflective of illusory growth. There are also no treatment studies to our knowledge that focus on disaster survivors and include measures of both PTG and PTS, leaving it to speculation how the

two constructs might relate to each other over time in post-disaster clinical interventions. Clearly, more research is needed in this area.

Chan, C. S., Rhodes, J. E., & Perez, J. E. (2012). A prospective study of religiousness and psychological distress among female survivors of Hurricanes Katrina and Rita. *American Journal of Community Psychology*

Pre-disaster religious involvement and faith were predictive of better post-disaster social resources, which, in turn, were associated with lower levels of psychological distress. Building on these findings, we examined the role of religious coping on post-hurricane outcomes. When the hurricane was interpreted as resulting from the wrath or punishment of God, or from demonic involvement then there was a higher risk for psychological disturbance. There was also a higher risk for psychological distress if the hurricane led to spiritual tension, questioning, or discontent. By contrast four years after Hurricane Katrina, positive religious coping was associated posttraumatic growth (PTG), above and beyond the protective effects of social support and optimism. Consistent with previous research, PTG was found to be strongly positively associated with symptoms of PTSD at the first follow-up wave.

Relief workers and mental health care providers should take note of the protective role of religion in the lives of survivors, and make efforts to restore faith-based organizations (e.g., to provide a place for and means to worship and practice one's faith); however they should also be aware of the potential risk that negative religious coping might pose for long-term symptomatology.

Lowe, S. R. & Rhodes, J. (2012). Community college re-enrollment after Hurricane Katrina. *Journal of College Student Retention*.

High levels of pre- and posthurricane educational optimism were significant predictors of reenrollment, as were lower posthurricane psychological distress and fewer post-hurricane hours employed. In addition, experiencing a greater number of moves since the hurricane was a marginally significant predictor of posthurricane re-enrollment.

It is noteworthy that a single item of educational optimism could significantly predict re-enrollment after the hurricane. Colleges seeking to screen students at risk of dropping out might consider administering this item at various stages of their education. In addition to educational optimism, a few other variables emerged as significant predictors of re-enrollment. A marginally significant predictor of re-enrollment was the number of moves experienced between the hurricane and the post-hurricane assessment. To counter the negative impact of frequent moves on re-enrollment after natural disasters, community college services, both in the affected area and in communities to which survivors have relocated, could connect students with resources related to housing and advocate on students' behalf if necessary. Residential instability might also be a proxy indicator of low psychosocial resources. In particular, displacement after a disaster is associated with greater depression and post-traumatic stress (Najarian et al., 2001), as well as lower socioeconomic status (Brodie et al., 2006). In non-disaster contexts, previous research has also found frequent moves to be associated with decreased tangible support and companionship (Magdol & Bessel, 2003), health declines (Larson, Bell & Young, 2004), and increases in psychological distress among women (Magdol, 2002). Number of moves, therefore, could be related to participants' access to psychosocial and economic resources that would enable them to reenroll in school after the hurricane. In a similar vein, participants' hours of employment were inversely related to their likelihood of community college reenrollment. This, too, could be a proxy for socioeconomic status in the aftermath of Hurricane Katrina. Participants with lower economic resources may have been more likely to prioritize stable employment over returning to school. This might have been particularly the case

		<p>or participants who were unable to navigate the bureaucracies that might help them to re-establish their lives. Community college personnel, in the affected area and elsewhere, should reach out to survivors of major stressors to provide them with information about financial aid. Reduced tuition or scholarships to survivors could alleviate financial stress and thereby promote re-enrollment. Lastly, participants' psychological distress after Hurricane Katrina was a negative predictor of re-enrollment. To offset the potential negative impact of psychological distress on educational attainment, community colleges could work to relocate former students and inform them of counseling services both on campus and in the community. This finding also provides support for well-advertised and affordable counseling services for natural disaster survivors.</p>
<p>Lowe, S., Green, G., &amp; Rhodes (2012). What can multi-wave studies teach us about disaster research?: An analysis of low-income Hurricane Katrina survivors. <i>Journal of Traumatic Stress</i></p>	<p>Post-disaster cross-sectional estimates of the impact of traumatic stress exposure produce somewhat inflated estimates of disaster and social support effects.</p>	<p>Recovery efforts that fail to take into account pre-disaster mental health may overestimate the effects of the disaster.</p>

<p>Lowe, S. R., Rhodes, J., &amp; Scoglio, A. (2012). Changes in Marital and Partner Relationships in the Aftermath of Hurricane Katrina: An Analysis of Low-Income Women. <i>Psychology of Women Quarterly</i></p>	<p>Many survivors reported external stressors following the hurricane including unemployment and prolonged separation, changes in their partner's perceived psychosocial functioning, and changes in the relationship process, particularly pertaining to relationship communication styles. Some survivors reported that the strain negatively impacted their relationships. Two of the forty survivors also cited the strain resulting from Katrina as the instigating factor that led their partner to physically abuse them. With one participant stating that strain from the hurricane led her partner to drink and become abusive and another noting that financial strain from the hurricane led her to return to her abusive partner. However, other survivors reported that their relationships grew stronger (18 of 40) following the hurricane. Those who reported stronger relationships noted that following the hurricane they had experienced decreased their economic distress and that this in turn benefited their relationships. Respondents who reported stronger relationships also noted that the hurricane brought about a greater sense of perspective.</p>	<p>Survivors in the study were attuned to the negative impact of disaster related stress on their partners' functioning (including increases in mental health symptoms as well as alcohol and substance use). In the aftermath of a hurricane, health care workers should be vigilant for spousal abuse. Financial as well as psychological problems following a large natural disaster can impact relationships and women's physiological well being. Increasing the financial stability of families by helping both men and women secure jobs may help mitigate some of these strains. However it is import to keep in mind that not all individuals will experience a hurricane as strain on their relationship, especially for those who are able to quickly find employment a hurricane may be seen as an opportunity for growth. Healthcare workers should be careful not to assume that a natural disaster has led to relationship instability.</p>
<p>Paxson, C., Rhodes, J., Waters, M. &amp; Fussell, E. (2012). Five Years Later: Recovery from Post Traumatic Stress and Psychological Distress Among Low-Income Mothers Affected by Hurricane Katrina. <i>Social Science and Medicine</i>.</p>	<p>Exposure to traumatic hurricane experiences (e.g. lack of food or water; not knowing where children were) and losses varied widely: 80.8% experienced home damage and 32.1% experienced the death of a friend or relative, By the second wave of data collection after Katrina (about 4 years after the hurricane), nearly 30% of our sample had levels of psychological distress high enough to indicate probable mental illness. Although this represents a decline from the initially post hurricane prevalence rate of 36% (about 1 year after the hurricane), it is still substantially higher than the pre-hurricane prevalence rate of 24% (Rhodes, Chan, Paxson, Rouse, Waters, &amp; Fussell, 2010). By the second wave of data collection symptoms of PTSD have also declined, but one third of the survivors still meet criteria of probable post-traumatic stress disorder. Factors associated with high levels of</p>	<p>Home damage has serious consequences for mental health, greatly increasing the risk of developing chronic post traumatic stress symptoms (PTSS), with or without psychological distress (PD). Fully 94% of those who had PTSS at the second follow-up had experienced home damage. The importance of home damage for PTSS may be due to the "secondary traumas" associated with the loss of community and the sometimes prolonged search for a new home (Gill 2007). These secondary traumas may have been more severe in the case of Hurricane Katrina, especially for low-income individuals. Another conclusion is that the effects of exposure to traumatic events during the hurricane on mental health have not faded over time. Although many individuals who experience PTSS and PD in the short run do recover, individuals exposed to trauma and loss continue to</p>

	<p>continuing symptoms of PTSD, especially in combination with psychological distress, include housing loss, traumatic experiences during the hurricane, and death of a family or friend</p>	<p>be at heightened risk of psychological problems long after the event is over. We found that pre-hurricane SES played a small role in protecting individuals from chronic mental health problems. This may be because higher-earning individuals may have been better positioned to find employment after the hurricane or to afford the costs of rebuilding or resettlement. Having social support was also protective against PD at the second follow-up.</p>
<b>2011</b>		
<p>Lowe, S. R., Chan, C. S., &amp; Rhodes. (2011). The impact of child-related stressors on the psychological functioning of lower-income mothers after Hurricane Katrina. <i>Journal of Family Issues</i>.</p>	<p>Lacking knowledge of a child's safety during the hurricanes was a significant predictor of heightened - psychological distress and PTSD, even after controlling for demographic variables, pre-disaster psychological distress, evacuation timing, and bereavement.</p>	<p>Given that separations from children were significantly predictive of postdisaster maternal mental health, systems that quickly reunite children with primary caregivers in the aftermath of disasters, including the National Emergency Child Locator Center within the National Center for Missing Children and FEMA's National Emergency Family Registry and Locator System, should be strengthened. Research and development grants to improve technologies that track missing children would be helpful in this regard (Shriver et al., 2009). Second, disaster preparedness should also include means to fulfill survivors' basic needs, including adequate shelter, food, and clothing (Madrid &amp; Grant, 2008), which was a primary concern of mothers in the current study. Structural barriers, including lack of adequate housing, transportation, employment and educational opportunities, and childcare, should also be addressed along- side psychological concerns. Likewise, policies that address structural barriers are needed to promote lower- income families' long-term stability and functioning.</p>

		<p>Additionally, disaster policies should increase readiness of health care facilities that serve children. Preparedness measures, such as evacuation medication packs, easily transferable immunization information systems, and electronic medical files, would protect against adverse physical and mental health outcomes among children, particularly those with chronic health conditions. Last, our findings suggest the need for expanded access to empirically supported, culturally competent, and developmentally appropriate mental health services in the aftermath of disasters (Weems, &amp; Pina, 2009).</p>
<p>Lowe, S. R., Lustig, K., &amp; Marrow, H. B. (2011). African American women's reports of racism during Hurricane Katrina: Variation by interviewer race. <i>New School Psychology Bulletin</i></p>	<p>This study investigated the effects of interviewer race on low-income African American female hurricane survivors' reports of racism during Hurricane Katrina and its aftermath (<math>N = 41</math>). Respondents were asked directly about the role of racism during the storm and evacuation by one of three interviewers (two White females and one African American female). Contrary to expectations, respondents were not significantly more likely to agree that racism played a role during the hurricane and its aftermath when with an African American interviewer compared to a White interviewer. However, when speaking to the White interviewers versus the African American interviewer, respondents were significantly more likely to use qualifying and contradictory statements and to make references to other races also being victims of the hurricane. We predicted that respondents would be significantly less likely to assert that racism played a part during and after the disaster with the White interviewers than with</p>	<p>A potential implication of this perspective is that African Americans' responses to African American interviewers might have greater validity due to respondents' greater comfort and trust. However, as Bobo and Fox (2003) note, researchers should not assume that African American's assessments of discrimination with an African American represent their "true" opinion. For example, Davis (1997a) speculates that, with African American interviewers, African Americans may feel pressure to report a heightened sense of racial solidarity or support for causes that are related to African Americans or persons of color and contrary to the dominant White culture. The results of the study also have implications for clinicians working with clients of other races, particularly White clinicians working with African American clients. As has been noted elsewhere (Hays, 2001; Sue &amp; Sue, 1999), clinicians should strive to maintain an awareness of how their own racial backgrounds affect their</p>



	<p>the African American interviewer. This hypothesis was not supported, however.</p>	<p>relationships with clients, what information clients will disclose, and especially how they will disclose and discuss sensitive topics. Both academic research and clinical interviews are active processes within which interviewer and clinician characteristics influence the type of, and the manner in which, information is shared by participants and clients. This is consistent with feminist scholars' assertion that the power and authority imbued in the researcher's role, personal position, and insider status significantly influence the co-construction of the interview (Hesse-Biber, 2007).</p>
<b>2009-2010</b>		
<p>Lowe, S. R., Chan, C. , &amp; Rhodes, J. E. (2010). Pre-Hurricane social support protects against psychological distress: An analysis of young, low-income, predominantly African-American mothers. <i>Journal of Consulting and Clinical Psychology</i>.</p>	<p>Pre-disaster social support protects survivors against post-disaster psychological distress; this effect was mediated through its effects on pre-disaster psychological distress, exposure to hurricane-related stressors, and post-disaster social support.</p>	<p>Efforts to mobilize and fortify social support can help to attenuate individuals' exposure to natural disaster and reduce adverse outcomes in their aftermath. In addition to bolstering social support, specialized post-disaster mental health services should be made more available.</p>

<p>Rhodes, J., Chan, C., Paxson, C., Rouse, C. E., Waters, M. &amp; Fussell, E. (2010). The impact of Hurricane Katrina on the mental and physical health of low-income parents in New Orleans. <i>American Journal of Orthopsychiatry</i>.</p>	<p>The prevalence of probable serious mental illness doubled, and nearly half of the respondents exhibited probable PTSD. Higher levels of hurricane-related loss and stressors were generally associated with worse health outcomes, controlling for baseline socio-demographic and health measures. Higher baseline resources predicted fewer hurricane-associated stressors, but the consequences of stressors and loss were similar regardless of baseline resources. Adverse health consequences of Hurricane Katrina persisted for a year or more, and were most severe for those experiencing the most stressors and loss. Additionally, higher personal income, more perceived social support, and ownership of a car predicted fewer hurricane-related stressors, but other resources, such as receipt of public benefits and mental and physical health, did not.</p>	<p>Affordable housing would help to promote the immediate safety as well as the long-term stability of fragile young families that are represented in this study. Likewise, the inclusion of women in the post-Katrina work force, both through the skills-training and enforcement of anti-discrimination laws, would help the survivors benefit from the influx of economic resources into the region. Educational resources and assistance are vitally needed to ensure that survivors can return to their educational goals.</p>
<p>Zwiebach, L., Rhodes, J., &amp; Roemer, L. (2010). Resource loss, resource gain, and mental health among survivors of Hurricane Katrina. <i>Journal of Traumatic Stress</i></p>	<p>Losses of social and other resources (i.e. personal property, physical health) were significantly associated with post-disaster psychological stress (Zwiebach, Rhodes, &amp; Roemer, 2010).</p>	<p>Declines in physical and mental health are related; the importance of shoring up services for survivors in these two domains is paramount. Counseling interventions are needed to help restore hope and expectations for the future, as well as to minimize and manage the elevated stress resulting from natural disasters. Most of the participants were single mothers, suggesting that timely intervention could offset problems in younger generations as well. Since many survivors of disasters come into contact with service agencies after a disaster, there may be unique opportunities to offer or refer to treatment. Finally, a priority of organizations working with disaster victims should be a focus on community-wide initiatives, attempting to preserve existing neighborhoods and social networks while fostering the formation of new social connections.</p>

Lowe, S.R., Rhodes, J., Zweibach, L., & Chan, C. (2009). The impact of pet loss on the perceived social support and psychological distress of Hurricane Survivors. *Journal of Traumatic Stress*

Pet loss was a significant predictor of post-hurricane distress, particularly for those with less robust social networks.

In addition to effective local planning, more pet-friendly policies in emergency shelters and hotels are needed. Furthermore, coordinated community efforts to reunite pets with their owners are also needed. With implementation of these policies, we may be able prevent at least some of the difficulties experienced following a natural disaster.