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# Predictors of resiliency in women affected by Hurricane Katrina

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PREDICTORS OF RESILIENCY IN WOMEN AFFECTED BY HURRICANE KATRINA

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Master of Arts

In

The Department of Psychology

by  
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## ABSTRACT

While the physical devastation of Hurricane Katrina was immediately obvious, the psychological effects of the storm are still being investigated and the positive effects of trauma, although few, have yet to be adequately explored. Although most individuals will experience a trauma during their lifetime, only a small minority experience negative psychological consequences (Breslau, 2002). Resiliency is a quickly developing area in the literature; however, few studies have investigated predictors of resilience and positive outcomes in adults exposed to natural disasters. The purpose of this study was to explore individual factors and predictors of resilience in women exposed to Hurricane Katrina. Participants include 279 women from New Orleans and surrounding parishes. Regression analyses indicate that women with greater levels of perceived social support were significantly more resilient than those with lower levels of support as evidenced by both lower PTSD symptom severity and global distress. However, contrary to proposed hypotheses, greater use of both positive and negative coping was related to greater PTSD symptomatology and global distress 3-7 months following Hurricane Katrina. Therefore, in the months immediately following Hurricane Katrina, greater use of problem-focused coping strategies may actually have deleterious effects on the psychological adjustment of survivors. Bivariate correlations indicate that the positive and negative coping variables were significantly correlated such that an increase or decrease one variable resulted in a similar increase/decrease in the other. Demographic variables were found to be inconsistent predictors of resiliency.

## INTRODUCTION

Hurricane Katrina made landfall along the United States Gulf Coast on Monday, August 25, 2005 and would come to be known as one of the most costly and destructive disasters in recent history (Brewin et al., 2006). Violent winds and rain battered the city and a breach in the levee system resulted in catastrophic flooding. As the levees failed, flood waters would cause widespread destruction, devastating economic loss, and death to more than 1,600 individuals (Weems et al., 2007). Thousands of residents were left homeless, children were left without schools, and the city of New Orleans was immobilized for months. As a result of the storm, it is estimated that over 500,000 people were evacuated and nearly 90,000 square miles of the Gulf Coast were declared a disaster area (Brewin et al., 2006).

Residents were confronted with widespread destruction, violence, threat to life, and exposure to the dead and dying. Therefore, individuals displaced by Hurricane Katrina often suffered a great deal of psychological and emotional distress (Kessler et al., 2008; Weems et al., 2007). Many families were forced into temporary housing, daily routines were disrupted, and the loss of possessions was great. Residents had to find new schools for their children, secure new housing and sources of income, and establish new social networks far from their home, friends, and family. Thus, survivors faced many obstacles and a period of adjustment in which they were forced to decide how they would respond to these widespread burdens of trauma.

### **Adjustment Following Hurricane Katrina**

Epidemiological studies indicate that most adults are exposed to at least one potentially traumatic event in their lifetime (Bonnano, 2005). However, not everyone reacts to these events in the same way. In adults, a wide range of mental and physical

health risks have been shown to emerge post-disaster. The most common reactions include feelings of anger, helplessness, guilt, posttraumatic stress, depression, anxiety, and increased substance use (Kessler et al., 2008). Although most people experience at least a transient period of distress and confusion, only a small subset of exposed adults develop Posttraumatic Stress Disorder (PTSD) and suffer long term psychological distress (Kessler et al., 2008; Galea et al., 2007).

A variety of variables related to psychological adjustment in adults post-trauma have been studied (Norris, Friedman, & Watson, 2002). Variables reported to be associated with increased PTSD symptomatology include female gender, lower socioeconomic status, multiple trauma exposure, and degree of disaster exposure (Brewin, Andrews, & Valentine, 2000; Norris, Friedman, & Watson, 2002). Additionally, researchers have focused on whether certain psychosocial factors (i.e. coping strategies, social support, and optimistic expectations) are associated with psychological distress for individuals who experience traumatic and stressful events (Glass et al., 2009).

Predictors of posttraumatic stress and psychopathology can be divided into three categories: pre-trauma, peri-trauma, and post-trauma (Freedy, Resnick, & Kilpatrick, 1992). Pre-trauma variables include demographic variables such as race, gender, and socioeconomic status. However, existing literature notes many inconsistencies among these factors such as gender, age, and race has predicted PTSD in some populations but not in others (Brewin et al., 2000). However, variables such as educational attainment, previous trauma experience, childhood adversity, and psychiatric history more consistently predict PTSD (Brewin et al., 2000). Next, peri-traumatic predictors

refer to factors that occur during or as an immediate result of the traumatic event. Severity of traumatic exposure, proximity to the disaster, financial loss, exposure duration, perceived safety, degree of injury, and loss of loved ones are notable examples (Weems et al., 2007). Cognitive processing, perceived detachment, and other actions/reactions engaged at the time of the trauma are also peri-traumatic variables. Finally, post-trauma predictors reflect variables that have a continuing impact once the initial threat has passed. Post-trauma variables such as continued financial strain, chronic exposure, and chronic health problems exacerbate negative outcomes of exposure to a natural disaster (Norris, Friedman, & Watson, 2002).

### **Recovery, Resiliency, and Posttraumatic Growth**

Psychological recovery was initially viewed as the most common trajectory for individuals exposed to a traumatic event (Bonanno, 2005). It was widely assumed that trauma exposed individuals would inevitably experience moderate to severe symptoms of depression, anxiety, or stress that interfere with daily living, mental health, and social/occupational functioning for a period of time following the event. After a few weeks or months, however, people would slowly begin to recover and their symptoms would dissipate as they rebuilt their lives. Recovery is therefore defined as “moderate to severe elevations in psychological symptoms that significantly disrupt normal functioning and decline gradually over the course of many months before returning to pre-trauma levels” (Bonanno, 2005).

Resilience, characterized by only transient symptomatology and a rapid return to baseline functioning, was therefore conceptualized to be an unlikely course for individuals in the aftermath of disasters. In fact, resilience among adults exposed to

potentially traumatic events was thought to occur rarely and only in exceptionally healthy or pathological individuals (McFarlane & Yehuda, 1996). As a result, recovery and resilience had traditionally been lumped together to represent an overall positive trajectory; distinct from that of vulnerability and psychological distress. Recently, however, there has been an interest in differentiating and understanding resiliency as a unique trajectory from recovery (Bonanno, 2005).

Resilience has also commonly been associated with a third post-disaster trajectory, that of posttraumatic growth. Posttraumatic growth represents positive psychological changes that are experienced as a result of encountering a highly challenging or traumatic experience (Tedeschi & Calhoun, 2004). Posttraumatic growth often results in new skill acquisition, improved insight, or higher levels of functioning than was achieved pre-disaster, while resilience represents maintenance of or a quick return to pre-trauma levels of functioning, rather than a growth beyond prior functioning levels. Importantly, Westphal and Bonanno (2007) noted that neither posttraumatic growth nor resilience is superior to the other; instead, the two constructs represent distinct subsets of people who respond differently to traumatic events.

Westphal and Bonanno (2007) asserted that “many if not most people are resilient in the face of trauma” and “resilient outcomes typically provide little need or opportunity for posttraumatic growth” (419). Studies have even gone so far as to indicate that posttraumatic growth and resilience were inversely related. Specifically, these studies found that participants who report the least posttraumatic growth also reported the most resilience, as measured by an absence of PTSD symptoms.

## **Resiliency**

Resiliency as a concept has its roots in the fields of physics and mathematics and was used to describe “the capacity of materials or systems to return to equilibrium after a displacement” (Norris et al., 2007). This concept was later expanded and applied to the understanding of adaptive capacities in individuals and communities (Bonanno, 2004); however, approaches taken to define resiliency have varied considerably across researchers (see Norris et al., 2007). In fact, the literature on resilience reflects little consensus about definitions, leading to substantial variations in the operationalization and measurement of key constructs across studies. Most definitions of resiliency, emphasize a capacity for successful adaptation in the face of disturbance, stress, or adversity, although resilience has also frequently been defined as the absence of a pathological outcome following exposure to a potentially traumatic event or life circumstance (Norris et al., 2007; Seery, Holman, & Silver, 2010; Luthar, Cicchetti, & Becker, 2000). Bonanno (2005) provides the most widely accepted definition, and conceptualizes resilience as “a relatively stable pattern of healthy functioning coupled with the enduring capacity for positive emotion and generative experiences”. Despite these definitional differences, resilience is characterized by relatively mild and short-lived disruptions and a stable trajectory of healthy functioning across time. Even though resilient individuals may experience an initial, brief spike in distress they manage to keep functioning at or near their normal levels (Bonanno, 2005). Thus, resilience involves the capacity to rebound after a negative experience (outcome) as well as the capacity to maintain healthy outcomes following exposure to (process) (Zautra, 2009).

Nonetheless, debate continues as to whether resilience is best conceptualized as a process or as an outcome.

Deriving from these definitional differences, research also suggests that there is no single source of resilience and no single resilient trajectory (Norris et al., 2007). Rather, resilience is thought to be achieved through multiple, and sometimes unexpected pathways (Bonnano, 2005). At the most general level, it is assumed that the same characteristics that promote healthy development in children should also promote resilience in adults.

Work in adult resiliency owes much to the developmental theorists who have highlighted various protective factors that promote healthy trajectories among children exposed to abuse and other unfavorable life circumstances (Norris et al., 2009). Evidence that many children thrived despite their high-risk status led to increasing empirical efforts to understand individual variations in response to adversity. Early efforts were primarily focused on personal qualities, such as autonomy or high self-esteem (Garmezy, 1991; Masten, 2001). As work in that area evolved, however, researchers began to increasingly acknowledge that resilience may derive from factors external to the child. Subsequent research led to the implication of attributes not only within the child, but aspects within their family and social environment as well (Garmezy, 1991; Werner & Smith, 2001). It soon became clear that positive adaptation despite exposure to adversity involves a developmental progression, such that new vulnerabilities and/or strengths often emerge with changing life circumstances (Garmezy, 1991; Werner & Smith, 2001).

This study will review existing literature in the area of psychological resiliency among disaster affected adults and examine the predictors of a resilient trajectory of functioning. The following will include a brief discussion of previous research on two relevant variables thought to be associated with resilience.

### **Coping and Resilience**

Coping has been defined as “actions and cognitions used to manage stressful demands” (Lazarus & Folkman, 1984) and has been categorized many ways. Common dichotomies include: emotion focused vs. problems focused, approach vs. avoidant, and escape vs. control (Folkman & Moskowitz, 2004; Vigna et al., 2009). Regardless of the above dichotomy, a distinction is generally made between coping that is adaptive and that which is maladaptive. Research on the relation of coping strategies to psychological distress in adults following a traumatic event has primarily focused on two domains: problem-focused and emotion-focused coping strategies (Lazarus & Folkman, 1984). Problem-focused coping strategies involve engaging in specific behaviors to overcome the problems associated with the traumatic event. These strategies are generally considered adaptive and are associated with positive adjustment after traumatic events (Lazarus & Folkman, 1984). Emotion-focused coping strategies involve directing effort towards regulating emotional responses to a traumatic event and typically include both active and avoidant strategies (Lazarus & Folkman, 1984). Emotion-focused coping and avoidant-focused coping attempt to eliminate the negative feelings associated with a major life stress by withdrawing physically and mentally from a potentially threatening situation that remind the individual of the event. Both coping styles are maladaptive in nature, and have been proven to increase psychological distress (Pina et al., 2008).

## **Social Support and Resilience**

Paramount among the secondary stressors that emerge after a disaster is the disruption of social networks. In the wake of a disaster, family and neighborhood relationships are often negatively affected, leaving family members feeling isolated and unable to cope. In terms of social support, Weems and colleagues (2007) stated that “Katrina seriously disrupted social ties and one’s ability to assess not only his or her extended community, but family members as well”. Norris and colleagues (2007) explain that the loss of important attachments after disaster is unavoidable. However, there is a growing body of evidence which demonstrates that social support helps protect against psychological distress post-trauma (e.g., Brewin, Andrews, & Valentine, 2000; Glass et al., 2009).

Social support is a multidimensional construct that includes physical and instrumental assistance, resource and information sharing, and emotional and psychological support. According to Vigil and Geary (2008), social support is also among the strongest predictors of long-term mental health and physical functioning following a traumatic event. Research has also demonstrated that social support increases adults’ ability to tolerate distressing life events (Schumm, Briggs-Phillips, & Hobfoll, 2006) and can bolster feelings of competency following disasters.

Social support has also been defined as social interactions that provide individuals with assistance and “embed them into a web of social relationships perceived to be loving, caring, and readily available” in times of need (Norris et al., 2007). Research on social support makes the distinction between “perceived” vs. “received” support and “functional” vs. “structural”. Functional support refers to a

person's perceptions of social interactions as helpful or unhelpful after a traumatic event, while structural support refers to the external aspects of an individual's social network (size or complexity). Psychological distress, specifically PTSD, seems to be more strongly associated with functional than structural support. Being continuously on the receiving end of support can threaten self-esteem, whereas being constantly on the providing end creates stress and burden (Glass et al., 2009).

Social support also enhances social influence (Norris et al., 2007). In emergencies, people look to others to help them make decisions about appropriate behaviors. For example, having a larger social network pre-disaster has been correlated with receiving information about evacuation and recovery (Brewin et al., 2006; Norris et al., 2007). Such conditions of positive social support would thus likely foster a quicker resolution of psychological problems.

### **Current Study and Hypotheses**

The devastation caused by Hurricane Katrina has been studied vigorously over the past five years. Although the physical devastation was immediately obvious, the psychological effects of Hurricane Katrina are still being investigated. The physical damage caused to the infrastructure of New Orleans has been well documented, as has the psychological and emotional distress suffered by its residents. The positive effects of trauma, although few, have yet to be adequately explored. Resiliency is a quickly developing area in the literature; however, few studies have investigated predictors of resilience and positive outcomes in adults exposed to natural disasters. The current study will explore the relationship of two predictors to resiliency and examine the influence of demographic variables on trajectories of distress and resiliency.

The purpose of this study is to explore individual factors and predictors of positive outcomes and resilience in women exposed to Hurricane Katrina. Since resilience is a multidimensional construct and impacts a variety of aspects of one's life and current functioning, it is the aim of this study to understand the influence of two predictors and the extent to which they lead to resilient outcomes post-disaster. It is theorized that coping strategies and social support will be important predictors of resiliency. Specifically, the following are hypothesized:

1. It is expected that women with higher levels of perceived social support will experience lower levels of psychopathology and distress on the SCL-90 three to seven months following disaster than those with lower perceived social support.
2. It is expected that women with higher levels of perceived social support will experience lower symptom severity as measured by the PDS.
3. It is predicted that use of positive coping strategies would predict resiliency in hurricane exposed women, as evidenced by low levels of distress and psychopathology on the Global Severity Index of the SCL-90.
4. It is predicted that the use of positive coping strategies would predict resiliency in hurricane exposed women, as evidenced by low symptom severity, as measured by the PDS.

## METHODS

### **Participants**

Participants include 279 women from New Orleans and surrounding parishes who lived in and around the city when Hurricane Katrina made landfall in 2005. Three to seven months after the Hurricane, mothers and their children were recruited from public and private schools to participate in a National Institute of Mental Health funded study. Descriptive statistics were used to describe the demographic characteristics such as age, race, income, and educational attainment for the study sample (See Table 1). Of this sample, 65.6% of participating women were African American, 23.8% were Caucasian, and 8.9% were of other ethnicities. Mean age for the female participants was 38.56 years, and median income was between \$25,000-34,000.

### **Measures**

**Demographic Questionnaire.** In order to obtain background information a demographic questionnaire was designed and administered to all women participating in the study. Demographic variables assessed included age, family income, education level, and race.

**Posttraumatic Stress Diagnostic Scale.** (PDS; Foa, 1995). The Posttraumatic Diagnostic Scale (PDS) is a 49-item, self-report questionnaire that assesses Posttraumatic Stress Disorder symptom severity and parallels DSM-IV-TR diagnostic criteria. Items assess symptoms corresponding to each of the major PTSD symptom categories (i.e., re-experiencing, avoidance/emotional numbing, and hyperarousal) as specified in the DSM-IV (APA, 1994). Items assess the presence, severity, and duration of symptoms using multiple-choice and yes/no response formatting. Low total symptom

**Table 1: Sample Characteristics**

<b>Variable</b>		<b>Sample Size</b>	<b>Percent of Total</b>
Age	M=38.56	N=279	
	(SD=7.44)		
Race			
	African American	183	65.6%
	Caucasian	65	23.8%
	Hispanic	7	2.5%
	Asian	14	5.0%
	Other	4	1.4%
Education			
	6 <sup>th</sup> grade or less	2	.7%
	Junior High	7	2.5%
	Partial High School	31	11.1%
	High school Graduate	80	28.7%
	Some College	88	31.5%
	College Graduate	41	14.7%
	Graduate Degree	14	5.0%
Income			
	\$0-4,999	45	16.1%
	\$5,000-9,999	25	9.0%
	\$10,000-14,999	26	9.3%
	\$15,000-24,999	36	12.9%
	\$25,000-34,999	41	14.7%
	\$35,000-49,999	25	9.0%
	\$50,000-74,999	32	11.5%
	\$75,000-99,999	10	3.6%
	\$100,000+	6	2.2%

severity score will be used as a criterion variable for resiliency in this study. Alpha for the total scale was .877 for the total sample, indicating good reliability.

**Interpersonal Support and Evaluation List.** (ISEL; Cohen and Hoberman, 1983). The ISEL is a 40-item self-report measure of perceived social support. On a 4-point scale, women indicated how true or false a particular statement was in terms of their own life (0=definitely false, 3= definitely true). Items are counterbalanced for desirability, meaning half the items are positive statements about supportive social relationships, while the other half has a negative valence. Alpha for the Global Severity Score was .743.

**Brief COPE.** (Carver, 1997). The Brief COPE is a 28-item measure that measures both adaptive and manipulative coping skills. Women were asked to rate coping statements according to how much or how frequently the statement reflects their day to day coping behaviors. Each item is scored on a 4-point Likert scale (1 = I haven't been doing this at all, 4 = I've been doing this a lot). Subscale scores were calculated by averaging scores for the items, and higher scores indicate greater use of that strategy. Research is limited concerning the psychometric properties of the Brief Cope. The few studies that have been done indicate internal reliabilities ranging from .50 to .90, and subscale reliability ranging from .75 to .82. Alpha for the entire scale is .91 for the total population. For the positive coping scale, the alpha value was .91 and for the negative coping scale the alpha was .791.

**Symptom Checklist-90-R.** (SCL-90- R; Derogatis et al.,1994). The SCL-90-R is a 90-item self-report inventory that assesses a broad range of psychopathology. Women responded to how much they experienced particular symptoms and were

distressed by specific problems in the past month using a 5-point Likert scale (0 = not at all, 4 = extremely). Once completed, the SCL-90-R is broken into nine primary symptom dimensions including somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Three global indices as well as a total global severity index provide an overview of reported symptoms and their severity. The SCL-90-R demonstrates high internal consistency (ranging from .77-.90 across symptom dimensions) and test-retest reliability (.80-.90). Levels of concurrent, convergent, discriminate, and construct validity are comparable to other self-report inventories such as the MMPI-2. Resiliency in this study will be characterized by low levels of symptomatology and low levels of distress as indicated by the SCL-90 Global Severity Index. Alpha for the whole scale was .986 indicating strong reliability.

## **Procedure**

The data used in the current study was part of a larger data set evaluating mother and child psychological functioning in the wake of Hurricane Katrina. After receiving IRB approval, permission was obtained from schools in New Orleans to recruit mothers with children in the 4<sup>th</sup>-8<sup>th</sup> grades. For this study, students received fliers and consent forms containing information about the study which they were to provide to their mothers. Mothers received a packet of measures in the mail, while their children completed study measures with graduate researchers at school. Questionnaires completed by the female participants/mothers included the demographic questionnaire, PDS, Brief COPE, SCL-90-R, and other measures that were part of a larger data set

(See Appendices A through E for measures). Data collection took place 3-7 months after Hurricane Katrina. Participants were compensated for their time and participation.

## RESULTS

### **Missing and Excluded Data**

Eleven women were excluded from the analyses as a result of substantially incomplete or missing data for one or more of the measures of interest. Of the remaining participants, missing responses were replaced through mean substitution which applies an estimated mean based on available cases to the missing data.

### **Zero-Order Bivariate Correlations**

Bi-variate correlations were conducted for all variables of interest. Of the three demographic variables, race, education, and income were all negatively correlated with the criterion variables of PTSD Symptom Severity and Global Severity Index. Race was significantly negatively correlated with perceived social support, while income evidenced a significant positive correlation. Education and income were negatively correlated with negative coping, while they were positively correlated with use of positive coping strategies. Finally, race and education were significantly correlated with income.

As expected, Table 2 demonstrates that perceived social support was significantly and negatively correlated with both PTSD symptom severity and Global Severity Index. Surprisingly, however, both negative and positive coping were significantly and positively correlated with the criterion variables. Positive coping was significantly and positively correlated with negative coping. Social support and positive coping were not significantly correlated with each other, although they demonstrated a positive relationship; however, social support demonstrated a significant negative correlation with negative coping.

**Table 2: Zero-Order Bivariate Correlations**

Variable	1	2	3	4	5	6	7	8
1. Race	---	-.069	-.285**	-.075	.040	-.117*	-.011	-.041
2. Education		---	.471**	.043	-.199**	.071	-.121*	-.097
3. Income			---	-.042	-.307**	.241**	-.119*	-.173**
4. Positive Coping				---	.382**	.034	.348**	.309**
5. Negative Coping					---	-.444**	.446**	.571**
6. Social Support						---	-.280**	-.383**
7. PTSD Symptom Severity							---	.541**
8. Global Severity Index								---

\*correlation is significant at the .05 level (2 tailed)

\*\*correlation is significant at the .01 level (2 tailed)

### PTSD Symptom Severity

In order to examine the proposed hypotheses, two separate hierarchical regressions were conducted to investigate the capacity of demographic variables, social support, and coping style to predict resiliency. For both hierarchical regression analyses, income and education were entered in step one in order to control for any significant effects of demographic variables. The relevant predictor variables (coping and social support) were entered on the second step. It was hypothesized that women with higher levels of perceived social support and greater use of positive coping strategies will experience lower PTSD symptom severity.

As seen in Table 3, the results indicate that in step one, education and income were non-significant predictors of PTSD symptom severity. Positive coping, negative coping, and perceived social support were added to the regression in step two. The

results indicate that perceived social support was a significant negative predictor of PTSD Symptom Severity, while positive coping and negative coping were determined to be a significant positive predictors [F(5,23.079),  $p < .01$ ]. These variables accounted for 24.4% of the variance in PTSD symptom severity.

**Table 3:** Hierarchical Regression Evaluating Demographic Variables, Positive Coping, and Social Support as Predictors of Resiliency (PDS Total Symptom Severity)

Variable	Step 1		Step 2	
	B	$\beta$	B	$\beta$
Education	-.958	-.087	-.959	-.087
Income	-.482	-.079	.241	.040
Social Support			-.106**	-.181**
Positive Coping			4.383**	.249**
Negative Coping			5.764**	.249**

$R^2 = .019^*$  for Step 1;  $\Delta R^2 = .225^{**}$  for Step 2

\*  $p < .05$ , \*\*  $p < .01$ ; all other predictors *n.s.*

### Global Psychopathology and Distress

To evaluate the remaining hypotheses, a second hierarchical regression was conducted to further evaluate the capacity of the above demographic, coping, and social support variable to predict resiliency. It was hypothesized that women with higher levels of perceived social support and greater use of positive coping strategies will experience resiliency and lower levels of psychopathology and distress three to seven months following disaster.

As seen in Table 4, results indicate that in step one of the regression analysis, income was a significant negative predictor of women's scores on the Global Severity Index. Education, although not significant, was negatively correlated with criterion

scores. The addition of positive coping, negative coping, and perceived social support in step two improved the existing model. All three variables were determined to be significant predictors of Global Severity Index scores. Perceived social support was negatively predictive, while positive and negative coping were shown to be positively predictive of distress and global psychopathology. Although the demographic variables entered at step one were significant predictors of Global Severity Index scores, the model was significantly improved by the addition of the coping and social support predictor variables. These variables accounted for 32.8% of the variance in global distress and symptom severity.

**Table 4:** Hierarchical Regression Evaluation Demographic Variables, Positive Coping, and Social Support as Predictors of Resiliency (SCL-90 Global Severity Index)

Variable	Step 1		Step 2	
	B	$\beta$	B	$\beta$
Education	-.004	-.034	-.002	-.017
Income	-.009*	-.148*	.000	.004
Social Support			-.001**	-.221**
Positive Coping			.028**	.153**
Negative Coping			.092**	.378**

$R^2 = .027^{**}$  for Step 1;  $\Delta R^2 = .301^{**}$  for Step 2

\*  $p < .05$ , \*\*  $p < .01$ ; all other predictors *n.s.*

## DISCUSSION

The purpose of this study was to identify predictors of resiliency in women affected by Hurricane Katrina. The importance of coping style and social support in trauma recovery has been widely postulated, however, this study sought to further examine the importance of these predictors as they relate to resiliency. The proposed hypotheses were partially supported. A discussion of the results and limitations is presented below.

Results indicate that the demographic variables of educational attainment and household income were inconsistent predictors of resiliency when entered into the regression models, despite evidencing significant negative bivariate correlations with each of the criterion variables. Income was a significant negative predictor of Global Severity Index scores at step one, however, with the inclusion of coping style and social support its influence became less robust. These results are consistent with findings from previous studies which have found demographic variables to be inconsistent predictors of PTSD (Brewin et al., 2000); however, these findings may also suggest that women with greater financial resources or access to resources through higher income may be more resilient than women with fewer resources.

Based on previous research, it was hypothesized that women with higher levels of perceived social support and greater use of positive coping strategies will experience a resilient trajectory, as evidenced by lower PTSD symptom severity scores. This hypothesis was partially supported by the results of the regression analyses. As expected, greater perceived social support was predictive of lower PTSD symptom severity. These results support the established relationship between social support and

positive outcome post-disaster, especially the findings of Glass, Flory, Hankin, Kloos, and Tulecki (2009) who reported that social supports help to protect against psychological distress post-trauma. However, contrary to proposed hypotheses, positive coping was positively related to PTSD symptomatology 3-7 months following Hurricane Katrina. Greater use of negative coping strategies was also positively predictive of PTSD symptom severity, such that an increase in coping (both positive and negative) resulted in a similar increase in PTSD symptomatology.

It was further hypothesized that women with higher levels of perceived social support and greater use of positive coping strategies will be more resilient. For this study, resiliency was characterized as lower levels of psychopathology and distress. Consistent with proposed hypotheses, higher levels of perceived social support was predictive of lower psychopathology and global distress. However, greater use of both positive and negative coping strategies was found to predict higher levels of symptomatology and distress on the Global Severity Index. Consistent with past research, women who reported more negative coping reported more psychological symptoms (Norris et al., 2002).

Therefore, the regression analyses above indicate that women with greater levels of social support were significantly more resilient than those with lower levels of support, evidencing both lower PTSD symptom severity and lower psychological distress. For that reason, it would be of great benefit to foster the social connectedness of friends, families, and neighbors following future disasters given that this construct is significantly related to less symptomatology. The women participating in this study, although initially displaced, returned to the city of New Orleans promptly after the storm. Therefore,

although these women were at risk for psychological challenges and poor coping post-disaster, their social support system may not have been as directly impacted as women who relocated outside of New Orleans and Louisiana for longer periods of time. Since social support may be conferred in a variety of forms (emotional, instrumental, or religious), future research should also focus on understanding the specific mechanisms of each type.

It was also believed that the problem solving skills inherent in positive coping would be an essential component of resiliency. However, the results of the previous regressions indicate that in the months immediately following Hurricane Katrina, greater use of problem-focused coping strategies may actually have deleterious effects on the psychological adjustment of survivors. Bivariate correlations indicate that the positive and negative coping variables were significantly correlated such that an increase or decrease one variable resulted in a similar increase/decrease in the other. Therefore, given the unprecedented magnitude of this storm, individuals may have tried to cope with the devastation using all available methodologies whether adaptive or maladaptive. This finding is also consistent with clinical research on individuals exposed to traumatic experiences. These studies have documented the potential for re-traumatization and poorer adjustment for individuals who prematurely enter treatment or actively engage in compensatory behaviors. These researchers recognize the utility of taking time to adjust to and process the current situation and experience normal emotions before employing active strategies for remediation. Clearly, more research on coping style is warranted.

## **Limitations and Future Directions**

There are several limitations of this study which should be noted. First, outcome variables were limited to paper/pencil measures, with no inclusion of observational or interview data. Also, due to the unprecedented nature of Hurricane Katrina, the generalizability of this study is unclear. Consequently, further research is warranted to see if these results are comparable to those found for individuals exposed to other natural disasters or other types of trauma. The findings of this study may have also been limited by the manner in which positive outcomes were measured. Given that this data was part of a larger existing data set, it was necessary to conceptualize positive outcomes and resiliency as the inverse or lack of negative pathology. Lack of pathology, however, may represent only one dimension of resiliency. Therefore, it would be of substantial utility for trauma researchers to objectively measure the presence of both positive and negative adjustment variables in future studies. By explicitly incorporating a broader array of variables into their studies, future researchers will hopefully be afforded a clearer picture of individuals who are most at risk for experiencing negative versus resilient trajectories. Finally, this study assessed participants at a single time point and employed a limited set of predictors. Therefore, these findings should be considered preliminary analysis and future research should include more rigorous methodology and a greater array of constructs (i.e. optimism and mastery) believed to be predictive of resilient trajectories following traumatic exposure.

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## VITA

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