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Predictors of positive adjustment in children exposed to the Deepwater Horizon Oil Spill and Hurricane Katrina

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PREDICTORS OF POSITIVE ADJUSTMENT IN CHILDREN EXPOSED TO THE
DEEPWATER HORIZON OIL SPILL AND HURRICANE KATRINA

A Thesis

Submitted to the Graduate Faculty of the
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in

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by
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TABLE OF CONTENTS

Abstract.....	iii
Introduction.....	1
Hurricane Katrina.....	1
Deepwater Horizon Oil Spill.....	2
Psychological Consequences of Disasters on Children.....	2
Positive Adjustment Following a Disaster.....	3
Social Support and Positive Adjustment.....	5
Coping and Positive Adjustment.....	6
Summary and Purpose.....	7
Method.....	8
Participants.....	8
Procedure.....	9
Measures.....	9
Behavior Assessment System for Children, Self-Report, Second Edition.....	9
Social Support Scale for Children.....	10
Kidcope.....	10
Social Support Questionnaire for Children.....	10
Youth Coping Responses Inventory.....	10
Results.....	12
Descriptive Statistics.....	12
Coping.....	12
Social Support.....	12
Child-Reported Positive Adjustment.....	13
Correlational Analyses.....	13
Regression Analyses.....	15
Discussion.....	17
Study Limitations.....	18
References.....	20
Appendix A: Youth Coping Responses Inventory.....	23
Appendix B: Social Support Questionnaire for Children.....	25
Appendix C: Social Support Scale for Children.....	27
Appendix D: Kidcope.....	29
Appendix E: IRB Approval Forms.....	30
Vita.....	32

ABSTRACT

Although numerous studies have focused on the harmful effects of natural disasters, few have examined the positive adjustment that is demonstrated by some individuals post-disaster. Even fewer studies have investigated this resiliency in children. The current study aims to address this limitation by evaluating variables related to children's resiliency post-disaster. Specifically, the study was designed to identify and compare predictors of positive adjustment in youth who were exposed to either Hurricane Katrina or the Deepwater Horizon Oil Spill. It was hypothesized that children who use more adaptive coping strategies and have higher levels of social support will show greater amounts of positive adjustment after a disaster. This hypothesis was partially supported in both samples. For children exposed to Hurricane Katrina, those who reported higher levels of classmate/peer, and teacher support also reported higher levels of personal adjustment. For oil spill exposed children, the use of destructive coping strategies resulted in lower levels of positive adjustment. Social support provided from parents and peers both emerged as significant predictors of positive adjustment in this sample. Determining the degree to which variables such as social support and coping predict positive adjustment allows for the identification of risk and protective factors in children exposed to natural or man-made disasters. The results of this study will also provide useful information to professionals working with trauma-exposed children.

INTRODUCTION

The devastating effects of natural disasters have been extensively researched with adults and, to a lesser degree, children. With rare exception, the literature focuses on factors predictive of negative outcomes following trauma exposure. Commonly these studies fail to evaluate factors related to children who return to pre-disaster levels of functioning or those who exhibit an unexpected positive outcome. Identification of pre- and post-disaster factors that contribute to this positive adjustment will help clinicians who treat children and families who are adjusting to the challenges presented by the disaster.

Events such as hurricanes, floods, tornadoes, terrorist attacks, and other devastating disasters undoubtedly cause severe distress to children who experience the event firsthand. In an attempt to examine how children adjust immediately after and in the months following a disaster, Klein, Devoe, Miranda-Julian, and Linas (2009) found that children were unexpectedly cooperative with their parents as the disaster unfolded. In the months following the disaster, however, many children developed sleep problems and exhibited increased levels of irritability, sadness, and fearfulness.

The current study examined two samples of children exposed to either the Deepwater Horizon Oil Spill or Hurricane Katrina in order to identify the factors that were predictive of resiliency and positive adjustment in the aftermath of the disasters.

Hurricane Katrina

Hurricane Katrina made landfall near the southern coast of Louisiana on August 29, 2005, becoming one of the most destructive hurricanes in U.S. history. Thousands of children and families were displaced due to the widespread damages caused. Children were exposed to an average of 7 hurricane-related events including: losing track of relatives, being taken to

another city, being separated from a parent, witnessing or hearing about others being hurt, sick, or dying, and/or having their home destroyed (Pina et al., 2008). Many of these children were left homeless in the aftermath of the hurricane. In a study of children exposed to Hurricane Katrina, Pina et al. (2008) found that 23.9% evidenced symptoms severe enough to meet criteria for Posttraumatic Stress Disorder (PTSD).

Deepwater Horizon Oil Spill

The Deepwater Horizon Oil Spill of 2010 was one of the most costly disasters in U.S. history, affecting both the wildlife and family functioning in southern Louisiana. Many individuals in the affected areas were financially dependent upon the fishing industry and likely experienced significant financial difficulties due to the impact of the oil spill on their livelihoods. In one of the few studies examining children exposed to oil spills, Kahn (1997) found that after the Prince William Sound Oil Spill in 1989, most children understood the devastating and life altering effects of the disaster. Recognition of the potentially devastating effects of oil spills may be adequate enough to develop both negative and positive adjustment post-disaster.

Psychological Consequences of Disasters on Children

PTSD is one of the most researched outcomes for children exposed to disasters. According to the DSM-IV-TR (American Psychiatric Association, 2000), PTSD occurs after experiencing or witnessing a traumatic event that is responded to with intense fear, helplessness, or horror. Individuals with PTSD exhibit a pattern of behavior that involves (1) re-experiencing in the form of flashbacks, dreams, and intrusive thoughts; (2) avoidance such as feelings of detachment, limited affect, and avoidance of activities associated with trauma; and (3) increased arousal such as sleep difficulties, anger, exaggerated startle response, and hypervigilance (American Psychiatric Association, 2000).

Garrison, Bryant, Addy, and Spurrier (1995) found that most children and adolescents exposed to Hurricane Andrew reported some symptoms of PTSD. In addition, 3% of males and 9% of females evidenced symptoms severe enough to meet full criteria for a diagnosis of PTSD. Studies of major depressive disorder and generalized anxiety disorder have found rates of 19% and 13%, respectively, in samples of children and adolescents exposed to disasters (Kar & Bastia, 2006). Additional findings also suggest that rates of PTSD increase with age (Garrison et al., 1995) and certain symptoms, such as hyperarousal, do not decline in the year after a natural disaster (La Greca, Silverman, Lai, & Jaccard, 2010). Many children continue to report substantial levels of post-traumatic stress up to two years after a disaster (La Greca et al., 2010). These findings provide overwhelming evidence of the distressing impact of natural disasters and the need to identify the factors that most effectively protect against these outcomes.

Collectively, the aforementioned negative responses to a traumatic event indicate a need to identify pre- and post-disaster factors that are the most effective in diminishing the negative impact of the trauma. The current study aims to identify these factors by examining the role that coping responses and social support play in the path to resiliency in children exposed to Hurricane Katrina and the Deepwater Horizon Oil Spill. Interestingly, because of the demographic characteristics of the area that each of these disasters impacted, examination of social support and coping variables allows for comparison of a rural, primarily Caucasian sample to an urban, predominantly African-American sample.

Positive Adjustment Following a Disaster

Despite the abundance of studies focusing on individual reactions to disasters, few have focused on children and adults who demonstrate positive adjustment and the factors that contribute to their rapid recovery. Ozer, Best, Lipsey, and Weiss (2003) estimate that around

50%-60% of the U.S. population will be exposed to a traumatic or stressful event; however, only 5%-10% of these individuals develop PTSD. The remaining individuals who do not develop PTSD remain at a healthy level of functioning after traumatic stress and are able to positively adapt in the face of adversity. The term “resilience” is often used to define the process of positive adjustment after a disaster or traumatic event. After exposure to a significantly adverse situation, resilient individuals are able to positively adapt despite the impairments caused by the trauma (Luthar, Cicchetti, & Becker, 2000). Many resilient individuals show no apparent disruptions in everyday functioning and interpersonal relationships despite this setback (Bonanno, 2008).

In addition to returning to or remaining at a healthy level of functioning, some individuals show an unexpected increase in functioning after a disaster. Children who exhibit this post-traumatic growth (PTG) not only return to pre-disaster functioning, but also experience positive outcomes as a result of trauma exposure (Tedeschi & Calhoun, 1996). Studies have also indicated that PTG is positively related to post-traumatic stress symptoms (Devine, Reed-Knight, Loiselle, Fenton, & Blount, 2010; Kilmer et al., 2009). Studies of PTG have defined three areas in which individuals may experience a positive outcome. *Perceived changes in self* describes changes that occur as a result of an individual experiencing a traumatic event and observing their own competence in handling the stress caused by their experience. *Changed sense of relationships with others* describes an individual’s realization of their need to self-disclose to others and acceptance of available social support that may have been ignored before the traumatic event. *A changed philosophy of life* describes an individual adopting an alternate explanation and perspective on life (Tedeschi & Calhoun, 1996).

Social Support and Positive Adjustment

Social support from various sources has been identified as a significant predictor of resiliency. Children who report greater exposure to a disaster subsequently report lower levels of perceived social support, which may contribute to the subsequent increase in negative outcomes (Norris & Kaniasty, 1996). Social support operates as a buffer against trauma-related stressors, psychological distress, and depression (Ellis, Nixon, & Williamson, 2009; Lowe, Chan, & Rhodes, 2010), and was associated with greater amounts of personal adjustment in children exposed to Hurricane Katrina (Vigna, Hernandez, Paasch, Gordon, & Kelley, 2009). Children's perceived social support is associated with lower levels of distress post-disaster and is the best predictor of post-disaster resiliency when compared to children's received social support (Chu, Saucier, & Hafner, 2010). In a meta-analysis examining the relationship between perceived social support and children's well-being, Chu et al. (2010) found a positive relationship between social support and overall well-being that increased with the age of children. However, the studies included in this meta-analysis examined social support under normal circumstances and did not include disaster-exposed children. Nevertheless, they have implications for the role that social support may play in helping disaster-exposed children return to previous levels of functioning.

The majority of the literature focuses on social support from either family members or extrafamilial adults and peers. The relationship between the source of social support and children's resiliency is unclear. Chu et al. (2010) found the strongest effect size for teachers and school personnel support, however, some studies indicate that peer (La Greca et al., 2010) and classmate support (Moore & Varela, 2010) are more significantly related to post-traumatic stress symptoms. Still others find strong relationships between both familial and extrafamilial support

and PTSD symptoms (Pina et al., 2008). The current study attempts to clarify this relationship by examining the various sources of support provided to disaster-exposed youth.

Coping and Positive Adjustment

Coping can be defined as processes that are employed to reduce anxiety and distress. In animal models, coping is often conceptualized as learned behaviors that function to improve chances of survival during life-threatening situations (Folkman & Lazarus, 1988). An alternative approach breaks coping down into approach and avoidance strategies. Approach strategies are those focused on solving various problems associated with the trauma and acquiring information relevant to a stress-inducing situation. Avoidance coping involves the utilization of strategies, such as distraction, that are useful in alleviating emotional distress (Altshuler & Ruble, 1989).

Numerous coping strategies are used by children in distressing situations. Tyc, Mulhern, Jayawardene, and Fairclough (1995) found that children used an average of seven strategies (e.g. cognitive restructuring, problem solving, wishful thinking, and distraction) in response to chemotherapy-related nausea and emesis. Those coping strategies that were rated as most effective were, not surprisingly, used most frequently.

The stress caused by natural disasters leads children to continually search for effective coping strategies (Lack & Sullivan, 2008). Positive coping strategies such as wishful thinking, emotional regulation, and distraction are naturally employed by children and effectively help children cope with stressful events (Tyc et al., 1995). The use of such strategies has been found to decrease severe psychopathology post-disaster (Jeney-Gammon & Daugherty, 1993; Pina et al., 2008) and is associated with greater personal adjustment (Vigna et al., 2009).

In addition to techniques used by children in response to traumatic events, significant others in a child's life can employ various techniques to help them cope. This coping assistance

is similar to social support in that another individual facilitates various techniques (e.g., distraction and reinstatement of familiar roles) that help the child return to normal levels of functioning (Prinstein, La Greca, Vernberg, & Silverman, 1996). In children exposed to Hurricane Andrew, Prinstein et al. (1996) found that reinstatement of familiar roles and routines was the most frequently used coping assistance strategy followed by distraction and emotional processing. In addition, children identified as having moderate to very severe levels of PTSD reported receiving more emotional processing assistance from parents and friends. These children also reported more distraction assistance from all sources when compared to children with low levels of PTSD.

Salloum and Lewis (2010) found that many of the individuals affected by Hurricane Katrina reported numerous occupational and financial difficulties, problems caring for children and family, and housing issues. Children in this sample reported using coping assistance most frequently. They also reported using other active coping strategies such as seeking meaning and cognitive restructuring. These children reported receiving coping assistance from various sources including family, friends, and God (Salloum & Lewis, 2010).

Summary and Purpose

The current study evaluated social support and various coping strategies to determine whether these factors were associated with positive adjustment in children affected by Hurricane Katrina, a primarily impoverished African-American sample, and those affected by the Deepwater Horizon Oil Spill, a primarily Caucasian rural sample. It was hypothesized that children's use of positive coping strategies and greater amounts of social support would lead to increased amounts of positive adjustment in both samples, although the source of support (e.g. parent, peers, adults) might vary across samples.

METHOD

Participants

Demographic characteristics of study participants can be found in Table 1. Children who participated in two larger studies conducted after both the Deepwater Horizon Oil Spill and Hurricane Katrina were included in the current study. Each sample (i.e., Hurricane Katrina and the Deepwater Horizon Oil Spill) included 68 children. These two studies were conducted separately and examined numerous factors associated with child and family functioning after a disaster.

Table 1. Demographic Characteristics of Study Participants

	Hurricane Katrina (Sample A)		Deepwater Horizon Oil Spill (Sample B)	
	N	%	N	%
Child Sex				
Male	24	35.3	24	35.3
Female	44	64.7	44	64.7
Race/Ethnicity				
African-American	43	63.2	4	5.9
Caucasian/White	17	25.0	43	63.2
Asian/Pacific Islander	4	5.9	6	8.8
Hispanic/Latino	2	2.9	3	4.4
American Indian or Alaskan Native	0	0.0	5	7.4
Other	0	0.0	2	2.9
Decline to Answer	2	2.9	5	7.4

Sample A. This sample included children from Orleans Parish who were impacted by Hurricane Katrina. The children were selected from a larger sample of hurricane exposed children and matched on gender and age with children who experienced the BP oil spill. Children in this sample ranged from ages 9 to 14 ($M=11.79$, $SD=1.43$). This sample was composed of 25% Caucasian, 63.2% African American, 5.9% Asian/Pacific Islander, and 2.9% Hispanic. Children completed questionnaires approximately four to seven months following the hurricane.

Sample B. Sample B consisted of children who were directly affected by the Deepwater Horizon Oil Spill. Children from the towns of Grand Isle, Lafitte, Houma, and Venice, Louisiana completed questionnaires regarding their coping strategies, social support, and personal adjustment after the Deepwater Horizon Oil Spill. Children ranged from ages 9 to 16 years ($M = 11.79$, $SD = 1.6$). Data were collected approximately six to ten months following the oil spill. Demographic characteristics were also collected. This sample was composed of 63.2% Caucasian, 5.9% African American, 7.4% American Indian or Alaskan Native, 8.8% Asian/Pacific Islander, and 4.4% Hispanic children.

Procedure

Children in both samples were administered several questionnaires including measures of social support from familial and extrafamilial sources, coping strategies used post-disaster, and positive adjustment. Children completed these questionnaires at their schools, community centers, or churches, and were provided small incentives for their participation.

Measures

Behavior Assessment System for Children, Self-Report, Second Edition.

Children in both samples completed the BASC-2. The BASC-2 is a 176-item self-report measure of behavior. Items are either rated as “True” or “False” or on a 4-point Likert scale ranging from 1 (“Never”) to 4 (“Almost Always”). The Personal Adjustment subscale of the BASC-2 is a composite measure of positive adjustment composed of the Relations with Parents, Interpersonal Relations, Self-Esteem, and Self-Reliance scales. This composite measure of personal adjustment was used as the criterion variable and an indicator of children’s post-disaster adjustment (Reynolds & Kamphaus, 2004).

Social Support Scale for Children. Children in the Hurricane Katrina sample completed the Social Support Scale for Children. This 24-item measure assesses social support provided to the child from parents, teachers, and peers/classmates. Children are presented with two statements and asked to choose the statement that best describes them. Children then rate the degree to which the statement represents them (Harter, 1985).

Kidcope. The Kidcope was also completed by the hurricane-exposed sample. This 15-item measure assesses children's use of ten coping strategies in response to traumatic events and yields two factors, positive and negative coping. Younger children (age 5 to 13) rated items as either "yes" or "no". A 4-point Likert scale (not at all, sometimes, a lot, and almost all the time) was used to examine positive and negative coping in older children (ages 13 to 16) (Spirito, Stark, & Williams, 1988).

Social Support Questionnaire for Children. The Social Support Questionnaire for Children is a 50-item measure of social support provided to children from five sources: parents, relatives, non-relative adults, siblings, and peers. Items are rated on a four-point Likert scale ranging from 0 ("Never or Rarely True") to 3 ("Always True"). This questionnaire provides a valid measure of social support by including additional sources of support used by ethnic minority populations (Gordon, 2011).

Youth Coping Responses Inventory. The YCRI is a 44-item self-report measure of coping strategies. Items are rated on a four-point Likert scale ranging from 1 ("Never") to 4 ("Almost Always"). This scale yields three factors related to coping for youth: Diversion, Destructive Coping, and Ameliorative Coping. The first factor, Diversion, measures coping strategies an individual uses to focus their attention away from the problem. Destructive Coping includes both destruction of property and self-destructive coping strategies. The final factor,

Ameliorative Coping, measures an individual's use of problem-solving and emotional expression (Hernandez, Vigna, & Kelley, 2010).

RESULTS

Descriptive Statistics

Table 2 provides descriptive information regarding all continuous variables examined in the study for Sample A. Table 3 contains information regarding Sample B variables.

Coping. Children in Sample A completed separate measures of coping depending on their age. Older children reported a mean of 6.82 (SD = 3.81) and 4.85 (SD = 2.47) for positive and negative coping, respectively. Younger children reported a mean of 4.20 (SD = 1.71) for positive coping and 3.24 (SD = 1.78) for negative coping. Out of a maximum score of 4 on the YCRI, children in Sample B reported a mean of 2.73 (SD = 0.53) for diversion coping, 1.64 (SD = 0.45) for destructive coping, and 2.35 (SD = 0.56) for ameliorative coping.

Social Support. Children in Sample A reported relatively high levels of social support from all sources. The mean scores for the social support variables were 3.33 (SD = 0.64) for parent support, 3.19 (SD = 0.52) for peer/classmate support, and 3.23 (SD = 0.56) for teacher support. Children in Sample B similarly reported high levels of social support from all sources. Out of a maximum score of 3, social support scores were 2.56 (SD = 0.60) for parent support, 2.33 (SD = 0.67) for relative support, 2.50 (SD = 0.62) for adult support, 2.11 (SD = 0.64) for peer support, and 2.09 (SD = 0.73) for sibling support.

Variable	Mean	SD
1. Parent Support	3.33	0.64
2. Peer/Classmate Support	3.19	0.52
3. Teacher Support	3.23	0.56
4. Positive Coping (older sample raw score) ^a	6.82	3.81
5. Positive Coping (younger sample raw score) ^a	4.20	1.71
6. Negative Coping (older sample raw score) ^a	4.85	2.47
7. Negative Coping (younger sample raw score) ^a	3.24	1.78
8. Personal Adjustment (T-score)	49.25	10.18

^aSeparate coping measures exist for each age group

Table 3. Means and Standard Deviations for Continuous Variables (Sample B)

Variable	Mean	SD
1. Parent Support	2.56	0.60
2. Relative Support	2.33	0.67
3. Adult Support	2.50	0.62
4. Peer Support	2.11	0.64
5. Sibling Support	2.09	0.73
6. Diversion Coping	2.73	0.53
7. Destructive Coping	1.64	0.45
8. Ameliorative Coping	2.35	0.56
9. Personal Adjustment (T-score)	51.86	9.92

Child-Reported Positive Adjustment. The BASC-2 Personal Adjustment scale is part of a nationally normed measure interpreted in terms of T-scores ($M = 50$, Range = 0 – 100). T-Scores above 70 represent high levels of adjustment and scores below 30 represent low levels of adjustment. None of the children in either sample endorsed high levels of adjustment. There was not a significant difference between groups in the amount of adjustment reported. For children in both samples, approximately 2% of the participants reported low levels of adjustment post-trauma. The majority of children reported levels of adjustment within the average range (Sample A, $M = 49.25$, $SD = 10.18$; Sample B, $M = 51.86$, $SD = 9.92$).

Correlational Analyses

Results of correlational analyses for Sample A are presented in Table 4. Neither the positive or negative coping variables were significantly associated with personal adjustment. For social support variables, parent support ($r = .51$), peer/classmate support ($r = .55$), and teacher support ($r = .57$) were significantly related to higher levels of personal adjustment.

Table 4. Bivariate Correlations Among Study Variables for Sample A

	1	2	3	4	5	6	7	8
1. Child Age	—							
2. Child Sex	.02	—						
3. Parent Support	-.20	.09	—					
4. Peer/Classmate Support	-.06	.22	.56**	—				
5. Teacher Support	-.19	.10	.73**	.56**	—			
6. Positive Coping	.09	.21	-.15	-.12	-.01	—		
7. Negative Coping	.02	.09	.00	-.14	.07	.655**	—	
8. Personal Adjustment	-.04	-.09	.51**	.55**	.57**	-.03	-.06	—

* Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Results of correlational analyses for Sample B are presented in Table 5. Significant relationships between the outcome measure, child-reported personal adjustment, and significant predictors ranged from .39 to .59. Diversion coping ($r = .39$) and destructive coping ($r = -.52$) were significantly associated with positive adjustment. All social support variables were significantly associated with personal adjustment, with coefficients ranging from .46 to .59.

Table 5. Bivariate Correlations Among Study Variables for Sample B

	1	2	3	4	5	6	7	8	9	10	11
1. Child Age	—										
2. Child Sex	-.25*	—									
3. Parent Support	-.03	.13	—								
4. Relative Support	-.11	.22	.74**	—							
5. Adult Support	-.18	.16	.75**	.82**	—						
6. Peer Support	-.07	.27*	.48**	.64**	.59**	—					
7. Sibling Support	.06	.09	.66**	.57**	.60**	.60**	—				
8. Div. Coping	-.19*	.09	.39**	.53**	.44**	.51**	.45**	—			
9. Dest. Coping	-.09	-.04	-.16	-.05	-.16	-.07	-.21	-.05	—		
10. Amel. Coping	-.33**	.27*	.14	.29*	.22	.41**	.27*	.63**	.34**	—	
11. Pers. Adjustment	-.10	.10	.59**	.47**	.55**	.52**	.46**	.39**	-.52**	.09	—

*Correlation is significant at the 0.05 level

**Correlation is significant at the 0.01 level

Regression Analyses

Sample A. A hierarchical regression analysis was conducted for Sample A. Results of the analysis are presented in Table 6. Child sex and age were entered in the first step. Social support and coping variables were entered in step 2. Results indicate that the overall model significantly predicted personal adjustment $F(7, 60) = 5.03, p < .01$. These variables accounted for 37% of the variance in children's report of positive adjustment. In this model, peer/classmate-provided social support ($B = 4.60, p = .05$) was a significant predictor and uniquely accounted for 4% of the variance as indicated by the Sr^2 statistic. Teacher support ($B = 5.15, p = .05$) was also a significant predictor and accounted for 4% of the variance. Positive and negative coping strategies were not significantly predictive of personal adjustment.

Table 6. Regression Analyses Predicting Child-Reported Personal Adjustment (Sample A)

	R^2	ΔR^2	B	β	Sr^2	F model
Step 1	.007					$F(2,65) = .234$
Child Sex			-1.47	-.08	0.03	
Child Age			-0.20	-.03	0.00	
Step 2	.37	.36				$F(7,60) = 5.03^{**}$
Parent Support			2.05	.14	0.00	
Peer/Classmate support			4.60*	.26	0.04	
Teacher Support			5.15*	.31	0.04	
Positive Coping			1.33	.15	0.01	
Negative Coping			-1.08	-.12	0.02	

*Significant at the 0.05 level

**Significant at the 0.01 level

Sample B. A hierarchical regression analysis was conducted to determine if children's coping strategies and social support significantly predicted positive adjustment. Child sex and age were entered in step 1. Social support and coping scores were entered into step 2 of the regression analysis. As indicated in Table 7, the overall model was significant, $F(10, 57) = 9.71, p < .01$, and accounted for 63% of the variance in children's report of positive adjustment. In this

Table 7. Regression Analyses Predicting Child-Reported Personal Adjustment (Sample B)

	R ²	ΔR ²	B	β	Sr ²	F model
Step 1	.018					<i>F</i> (2,65) = .546
Child Sex			1.58	.077	0.00	
Child Age			-0.57	-.094	0.00	
Step 2	.630	.612				<i>F</i> (10,57) = 9.71**
Diversion Coping			1.28	.07	0.00	
Destructive Coping			-10.19**	-.46	0.14	
Ameliorative Coping			.966	.06	0.00	
Parent Support			7.58**	.47	0.07	
Relative Support			-2.17	-.15	0.00	
Adult Support			1.27	.08	0.00	
Peer Support			5.41**	.35	0.05	
Sibling Support			-2.06	-.06	0.00	

*Significant at the 0.05 level

**Significant at the 0.01 level

model, destructive coping was a significant predictor of positive adjustment post-disaster ($B = -10.19$, $p < .01$) and uniquely accounted for 14% of the variance, as indicated by the Sr^2 statistic.

Parent-provided social support ($B = 7.58$, $p < .01$) and peer social support ($B = 5.41$, $p < .01$) were significant social support variables and accounted for 7% and 5% of the variance in personal adjustment, respectively.

DISCUSSION

The current study contributes to the existing literature on children's responses to traumatic events by examining the extent to which social support and coping predict child-reported personal adjustment. Previous research on trauma-exposed youth primarily focused on identifying variables associated with maladjustment after trauma exposure. The current study is one of only a few that has examined factors predictive of higher levels of positive adjustment, with an emphasis on social support and coping variables provided to children after two separate traumas, Hurricane Katrina and the Deepwater Horizon Oil Spill.

For the oil spill exposed sample, the hypothesis that the use of positive coping strategies would be associated with greater amounts of positive adjustment was partially supported. Although diversion and ameliorative coping were not significant predictors, destructive coping was inversely related to positive adjustment, indicating that self-destructive behaviors and the destruction of property resulted in lower levels of positive adjustment. For the Hurricane Katrina sample, neither coping strategy (i.e. positive coping and negative coping) emerged as a significant predictor of post-traumatic positive adjustment.

For social support variables, the results indicate that social support is significantly associated with positive adjustment. Parent-provided social support was significantly associated with positive adjustment for children exposed to the Deepwater Horizon Oil spill. Teacher-provided social support emerged as a significant predictor in the Hurricane Katrina sample. Interestingly, social support provided from a peer or classmate was associated with greater levels of personal adjustment in both samples. This finding is consistent with previous research with children exposed to Hurricane Katrina. Specifically, Pina et al. (2008) found that social support provided from extrafamilial sources buffered against post-traumatic stress symptoms, anxiety,

and depression. Social support provided from family members was not found to be a significant predictor of these outcome variables. Moore and Varela (2010) found that hurricane-exposed children who reported higher levels of classmate support exhibited fewer PTSD symptoms than those who endorsed lower levels of support. These authors posited that post-trauma social support may be difficult for hurricane-exposed children to access due to being displaced from neighborhood friends and family. As parents dedicate many of their emotional and financial resources to rebuilding their lives after the trauma, children rely on conversation with classmates and friends who may have experienced similar situations.

Study Limitations

Although this study provides useful information regarding the variables associated with children's post-trauma adjustment, several limitations should be noted. First, this study presented correlational relationships between personal adjustment and the coping and social support variables of interest. Causal conclusions cannot be drawn from these associations. Additionally, although hurricane-exposed participants were drawn from a large, already established data set, sample size for this study was limited by the number of participants available in the smaller data set (Sample B). This resulted in a relatively small sample size for both groups. In addition, different measures of coping and social support were used in each of the samples, which prevented the direct comparison of between-group differences in the use of these variables and their differential effects across different traumas. Finally, pre-disaster measures were not available, so it is difficult to determine pre-trauma levels of adjustment, the use of specific coping strategies, and the availability of social support. Future studies could expand and improve upon this work by examining the relationships among positive adjustment,

coping strategies, and social support in larger disaster-affected samples and with the use of consistent measures of these variables.

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APPENDIX A: YOUTH COPING RESPONSES INVENTORY

Directions: People do different things when they are very upset or bothered by a problem or situation. Indicate how often you do each of the following things when you experience a serious problem or situation. Circle 1 for Never, 2 for Sometimes, 3 for Often, and 4 for Almost Always.

TO HELP MYSELF DEAL WITH THE PROBLEM, I ...

HOW OFTEN DID YOU DO THIS?

	Never	Sometimes	Often	Almost Always
1. Return to doing things with friends.	1	2	3	4
2. Try to relax or calm down.	1	2	3	4
3. Spend time with my family.	1	2	3	4
4. Try to see the good side of things.	1	2	3	4
5. Yell, scream, or get angry.	1	2	3	4
6. Stay by myself.	1	2	3	4
7. Return to doing things with my family.	1	2	3	4
8. Do something quiet like watch TV, _____ play on the computer, or read a book.	1	2	3	4
9. Pray.	1	2	3	4
10. Blame someone for causing the problem.	1	2	3	4
11. Keep quiet about the problem.	1	2	3	4
12. Play a game to forget my problems.	1	2	3	4
13. Imagine I am in the situation again.	1	2	3	4
14. Talk with a friend about the problem.	1	2	3	4
15. Know the problem is in God's hands.	1	2	3	4
16. Focus on the cause of the problem.	1	2	3	4
17. Take it out on others.	1	2	3	4
18. Return to helping around the house.	1	2	3	4
19. Play sports to forget my problems.	1	2	3	4
20. Ask adults for advice.	1	2	3	4
21. Cry to let my feelings out.	1	2	3	4
22. Write about the situation for myself only (like in a diary).	1	2	3	4
23. Destroy things.	1	2	3	4
24. Eat more than usual.	1	2	3	4
25. Look for people who can help me.	1	2	3	4
26. Wish that I could change the way that I feel.	1	2	3	4
27. Focus on how to solve the problem.	1	2	3	4
28. Tell myself things to make me feel better.	1	2	3	4

HOW OFTEN DID YOU DO THIS?

	Never	Sometimes	Often	Almost Always
29. Return to after-school activities like sports, dance, or clubs.	1	2	3	4
30. Receive comfort from friends.	1	2	3	4
31. Come up with several different solutions to the problem.	1	2	3	4
32. Refuse to obey adults.	1	2	3	4
33. Receive comfort from family.	1	2	3	4
34. Expect the worst possible outcome.	1	2	3	4
35. Return to my regular daytime activities like church or school.	1	2	3	4
36. Do a physical activity like riding my bike or walking.	1	2	3	4
37. Receive comfort from my place of worship.	1	2	3	4
38. Try to understand the situation.	1	2	3	4
39. Return to completing homework.	1	2	3	4
40. Tell myself that it is not really happening to me.	1	2	3	4
41. Take it out on myself.	1	2	3	4
42. Make jokes about it.	1	2	3	4
43. Try to think of positive things.	1	2	3	4
44. Focus on what is good in my life.	1	2	3	4

APPENDIX B: SOCIAL SUPPORT QUESTIONNAIRE FOR CHILDREN

		Never or Rarely True	Sometimes True	Often or Very True	Always True
1.	I have a relative who gives me good advice.	0	1	2	3
2.	I enjoy spending time with a sibling.	0	1	2	3
3.	I have a sibling who treats me fairly.	0	1	2	3
4.	A relative helps me feel good about myself.	0	1	2	3
5.	A peer comforts me when I am upset.	0	1	2	3
6.	A peer cares about me and makes me feel wanted.	0	1	2	3
7.	A sibling helps me when I need it.	0	1	2	3
8.	A parent shows me affection.	0	1	2	3
9.	A relative is there when I need them.	0	1	2	3
10.	A peer gives me good advice.	0	1	2	3
11.	I have a relative who shows me how to do things.	0	1	2	3
12.	I have an adult in my life who really cares about me.	0	1	2	3
13.	A sibling will let me borrow money if needed.	0	1	2	3
14.	A peer accepts me for who I am.	0	1	2	3
15.	A parent makes sure I have what I need.	0	1	2	3
16.	A peer supports my decisions.	0	1	2	3
17.	A relative helps me when I need it.	0	1	2	3
18.	I have a peer I can count on.	0	1	2	3
19.	A peer encourages me.	0	1	2	3
20.	A sibling comforts me when I am upset.	0	1	2	3
21.	A parent helps me feel good about myself.	0	1	2	3
22.	I have a parent who encourages me.	0	1	2	3
23.	I have a parent who treats me fairly.	0	1	2	3
24.	A parent helps me when I need it.	0	1	2	3
25.	A relative explains things I don't understand.	0	1	2	3
26.	I have a sibling who supports my decisions.	0	1	2	3
27.	An adult comforts me when I am upset.	0	1	2	3
28.	An adult spends time with me when I need it.	0	1	2	3
29.	A relative comforts me when I am upset.	0	1	2	3

		Never or Rarely True	Sometimes True	Often or Very True	Always True
30.	A parent shows me how to do things.	0	1	2	3
31.	I have an adult in my life who I can really count on.	0	1	2	3
32.	I have a parent that I can count on.	0	1	2	3
33.	A sibling gives me affection.	0	1	2	3
34.	A parent cares about my feelings.	0	1	2	3
35.	A relative listens when I want to talk.	0	1	2	3
36.	A parent listens when I want to talk.	0	1	2	3
37.	An adult shows me how to do things.	0	1	2	3
38.	I have a sibling who cares about me.	0	1	2	3
39.	A relative helps take care of things I can't do alone.	0	1	2	3
40.	An adult helps me when I need it.	0	1	2	3
41.	An adult helps me feel good about myself.	0	1	2	3
42.	I have a peer who understands me.	0	1	2	3
43.	I have a peer who will lend me money if I need it.	0	1	2	3
44.	A peer praises me when I've done something well.	0	1	2	3
45.	I have a sibling I can trust to keep a secret.	0	1	2	3
46.	An adult gives me good advice.	0	1	2	3
47.	A sibling accepts me for who I am.	0	1	2	3
48.	An adult shows me affection.	0	1	2	3
49.	A relative helps me cope with my problems.	0	1	2	3
50.	An adult cares about my feelings.	0	1	2	3

APPENDIX C: SOCIAL SUPPORT SCALE FOR CHILDREN

Check
at least
one

PEOPLE IN MY LIFE

Name _____
(First) (Last)

	Really True for Me	Sort of True for Me	Sample Item	Sort of True for Me	Really True for Me		
	<input type="checkbox"/>	<input type="checkbox"/>	Some kids like to do fun things with a lot of other people	BUT	Other kids like to do fun things with just a few people.	<input type="checkbox"/>	<input type="checkbox"/>
1.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have parents who <i>don't</i> really understand them	BUT	Other kids have parents who really <i>do</i> understand them.	<input type="checkbox"/>	<input type="checkbox"/>
2.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have classmates who like them the way they are	BUT	Other kids have classmates who wish they were <i>different</i> .	<input type="checkbox"/>	<input type="checkbox"/>
3.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have a teacher who <i>helps</i> them if they are <i>upset</i> and have a problem	BUT	Other kids <i>don't</i> have a teacher who helps them if they are upset and have a problem.	<input type="checkbox"/>	<input type="checkbox"/>
4.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have a close friend who they can tell <i>problems</i> to	BUT	Other kids <i>don't</i> have a close friend who they can tell problems to.	<input type="checkbox"/>	<input type="checkbox"/>
5.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have parents who <i>don't</i> seem to want to hear about their children's problems	BUT	Other kids have parents who <i>do</i> want to <i>listen</i> to their children's problems.	<input type="checkbox"/>	<input type="checkbox"/>
6.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have classmates that they can become friends with	BUT	Other kids <i>don't</i> have classmates that they can become friends with.	<input type="checkbox"/>	<input type="checkbox"/>
7.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> have a teacher who <i>helps</i> them to <i>do</i> their very best	BUT	Other kids <i>do</i> have a teacher who <i>helps</i> them to do their very best.	<input type="checkbox"/>	<input type="checkbox"/>
8.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have a close friend who really <i>understands</i> them	BUT	Other kids <i>don't</i> have a close friend who understands them.	<input type="checkbox"/>	<input type="checkbox"/>
9.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have parents who <i>care</i> about their feelings	BUT	Other kids have parents who <i>don't</i> seem to care very much about their children's feelings.	<input type="checkbox"/>	<input type="checkbox"/>
10.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have classmates who sometimes make fun of them	BUT	Other kids <i>don't</i> have classmates who make fun of them.	<input type="checkbox"/>	<input type="checkbox"/>
11.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>do</i> have a teacher who <i>cares</i> about them	BUT	Other kids <i>don't</i> have a teacher who cares about them.	<input type="checkbox"/>	<input type="checkbox"/>

(OVER)

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me	
12.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have a close friend who they can talk to about things that bother them	BUT	Other kids <i>don't</i> have a close friend who they can talk to about things that bother them.	<input type="checkbox"/>	<input type="checkbox"/>
13.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have parents who treat their children like a <i>person</i> who really matters	BUT	Other kids have parents who <i>don't</i> usually treat their children like a person who matters.	<input type="checkbox"/>	<input type="checkbox"/>
14.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have classmates who pay attention to what they say	BUT	Other kids have classmates who usually <i>don't</i> pay attention to what they say.	<input type="checkbox"/>	<input type="checkbox"/>
15.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> have a teacher who is <i>fair</i> to them	BUT	Other kids <i>do</i> have a teacher who is fair to them.	<input type="checkbox"/>	<input type="checkbox"/>
16.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> have a close friend who they like to spend time with	BUT	Other kids <i>do</i> have a close friend who they like to spend time with.	<input type="checkbox"/>	<input type="checkbox"/>
17.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have parents who like them the way <i>they are</i>	BUT	Other kids have parents who wish their children were <i>different</i> .	<input type="checkbox"/>	<input type="checkbox"/>
18.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> get asked to play in games with classmates very often	BUT	Other kids <i>often</i> get asked to play in games by their classmates.	<input type="checkbox"/>	<input type="checkbox"/>
19.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> have a teacher who cares if they feel bad	BUT	Other kids <i>do</i> have a teacher who cares if they feel bad.	<input type="checkbox"/>	<input type="checkbox"/>
20.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> have a close friend who really <i>listens</i> to what they say	BUT	Other kids <i>do</i> have a close friend who really listens to what they say.	<input type="checkbox"/>	<input type="checkbox"/>
21.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have parents who <i>don't</i> act like what their children do is <i>important</i>	BUT	Other kids have parents who <i>do</i> act like what their children do is important.	<input type="checkbox"/>	<input type="checkbox"/>
22.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids often spend recess being <i>alone</i>	BUT	Other kids spend recess playing with their classmates.	<input type="checkbox"/>	<input type="checkbox"/>
23.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids have a teacher who treats them like a <i>person</i>	BUT	Other kids <i>don't</i> have a teacher who treats them like a person.	<input type="checkbox"/>	<input type="checkbox"/>
24.	<input type="checkbox"/>	<input type="checkbox"/>	Some kids <i>don't</i> have a close friend who cares about their feelings	BUT	Other kids <i>do</i> have a close friend who cares about their feelings.	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX D: KIDCOPE

Child Version (Ages 5 – 13)

1.	I just tried to forget it	Yes	No
2.	I did something like watch TV or played a game to forget it	Yes	No
3.	I stayed by myself	Yes	No
4.	I kept quiet about the problem	Yes	No
5.	I tried to see the good side of things	Yes	No
6.	I blamed myself for causing the problem	Yes	No
7.	I blamed someone else for causing the problems	Yes	No
8.	I tried to fix the problem by thinking of answers	Yes	No
9.	I tried to fix the problem by doing something or talking to someone	Yes	No
10.	I yelled, screamed, or got mad	Yes	No
11.	I tried to calm myself down	Yes	No
12.	I wished the problem had never happened	Yes	No
13.	I wished I could make things different	Yes	No
14.	I tried to feel better by spending time with other like family, grownups or friends	Yes	No
15.	I didn't do anything because the problems couldn't be fixed	Yes	No

Adolescent Version (Ages 13 – 16)

1.	I thought about something else: tried to forget it; and/or went and did something like watch TV or play a game to get it off my mind	0	1	2	3
2.	I stayed away from people; kept my feelings to myself; and just handled the situation on my own	0	1	2	3
3.	I tried to see the good side of things and/or concentrated on something good that could come out of the situation	0	1	2	3
4.	I realized that someone else caused the problem and blamed myself for causing it	0	1	2	3
5.	I realized that someone else caused the problem and blamed them for making me go through this	0	1	2	3
6.	I thought of ways to solve the problem; talked to others to get more facts and information about the problem and/or tried to actually solve the problem	0	1	2	3
7a.	I talked about how I was feeling; yelled, screamed, or hit something	0	1	2	3
7b.	I tried to calm myself by talking to myself, praying taking a walk, or just trying to relax	0	1	2	3
8.	I kept thinking and wishing this had never happened; and/or that I could change what had happened	0	1	2	3
9.	Turned to my family friends, or other adults to help me feel better	0	1	2	3
10.	I just accepted the problem because I knew I couldn't do anything about it.	0	1	2	3

APPENDIX E: IRB APPROVAL FORMS



Institutional Review Board
203 B-1 David Boyd Hall
Louisiana State University and A&M College
Baton Rouge LA 70803

(225) 578-8692
FAX: 578-6792
irb@lsu.edu

LSU IRB
ACTION ON PROTOCOL APPROVAL REQUEST

TO: Mary Lou Kelley
Psychology
FROM: Robert C. Mathews, Chairman
Institutional Review Board for Research with Human Subjects
DATE: November 30, 2005
RE: IRB# 2561

TITLE: "Predictors of Recovery in Children Evacuated from Hurricane Katrina"

New Protocol/Modification: M

Review type: Full Expedited X Review date: 11/30/2005

Approved X Disapproved

Approval Date: 11/30/2005 Approval Expiration Date: 11/30/2006

Re-review frequency: (annual unless otherwise stated)

Number of subjects approved: 400

By: Robert C. Mathews

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING -- Continuing approval is CONDITIONAL on:

- 1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
7. Notification of the IRB of a serious compliance failure.
8. SPECIAL NOTE:

*All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.osr.lsu.edu/osr/comply.html

Application for Approval of Projects Which Use Human Subjects

This application is used for projects/studies that cannot be reviewed through the exemption process.



Institutional Review Board
 Dr. Robert Mathews, Chair
 131 David Boyd Hall
 Baton Rouge, LA 70803
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 F: 225.578.6792
 irb@lsu.edu
 lsu.edu/irb

– Applicant, Please fill out the application in its entirety and include two copies of the completed application as well as parts A-E, listed below. Once the application is completed, please submit to the IRB Office for review and please allow ample time for the application to be reviewed Expedited reviews usually takes 2 weeks. Carefully completed applications should be submitted 3 weeks before a meeting to ensure a prompt decision.

– A Complete Application Includes All of the Following:

- (A) Two copies of this completed form and two copies of part B thru E.
- (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
- (C) Copies of all instruments to be used.
 *If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
- (D) The consent form that you will use in the study (see part 3 for more information.)
- (E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>)
- (F) IRB Security of Data Agreement: (<http://www.lsu.edu/irb/IRB%20Security%20of%20Data.pdf>)

1) Principal Investigator*: Rank

*PI must be an LSU Faculty Member

Dept: Ph: E-mail:

2) Co Investigator(s): please include department, rank, phone and e-mail for each

Russell Matthews, Ph. D. Assistant Professor Dept. of Psychology, LSU matthews@lsu.edu	Shannon Self-Brown Associate Professor Dept. of Psychology, Georgia State University sselfbrown@gsu.edu
---	--

3) Project Title:

4) Proposal Start Date: 5) Proposed Duration Months:

6) Number of Subjects Requested: 7) LSU Proposal #:

8) Funding Sought From:

ASSURANCE OF PRINCIPAL INVESTIGATOR named above

I accept personal responsibility for the conduct of this study (including ensuring compliance of co-investigators/co-workers) in accordance with the documents submitted herewith and the following guidelines for human subject protection: The Belmont Report, LSU's Assurance (FWA00003892) with OHRP and 45 CFR 46 (available from <http://www.lsu.edu/irb>). I also understand that copies of all consent forms must be maintained at LSU for three years after the completion of the project. If I leave LSU before that time, the consent forms should be preserved in the Departmental Office.

Signature of PI *Mary L. Kelley* Date 7-30-10

ASSURANCE OF STUDENT/PROJECT COORDINATOR named above. If multiple Co-Investigators, please create a "signature page" for all Co-investigators to sign. Attach the "signature page" to the application.

I agree to adhere to the terms of this document and am familiar with the documents referenced above.

Signature of Co-PI (s) *[Signature]* Date 8-5-10

315

IRB #	LSU Proposal #
<input type="radio"/> Full	
<input checked="" type="radio"/> Expedited	
<input type="radio"/> Human Subjects Training	
<input type="radio"/> Human Subjects Training	

Study Approved By:
 Dr. Robert C. Mathews, Chairman
 Institutional Review Board
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