

The Relationships Between Risk Factors, Household Adaptive Behaviors, and the Mediating Role of Flood Risk Perceptions

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Abstract

This purpose of this research is to examine the multiple relationships that explain household adaptive behaviors, and if (and how) risk perceptions play a mediating role in these relationships. Given the shift in transferring risks from flood risk governance structures to households, there is a renewed interest in promoting private adaptive behavior amongst households that are vulnerable to flood impacts. The population for this quantitative study is individual households in Portsmouth, Virginia (n=1,978). The integrated conceptual framework considers the assumptions of Protection Motivation Theory and the Psychometric Paradigm. Findings from this study will contribute to practitioners' understanding of the role of risk perception in flood risk management to better transfer risk to households and promote adaptive behavior. This study also builds on the theoretical knowledge of how risk perceptions explain adaptive behaviors in flood contexts.

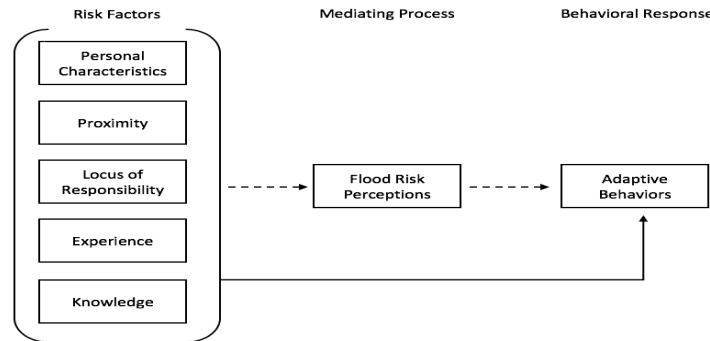
Background

- Flooding as a natural hazard
 - Flooding is the United States' most common and costly natural hazard
 - Flood events affect more than 8 million residents around the country
- Coastal Vulnerability
 - Residents near coastal seaboard are experiencing the effects of climate change through increased storm severity, storm surge, and recurrent flooding
 - The projected impacts of sea level rise will increase residents' exposure, potentially causing damage to their house dwelling
- Adaptive Behaviors
 - Residents may choose to engage in adaptive behaviors which are adjustments
- Risk Perceptions
 - Provide greater protection from flooding
 - Dune width is more important than dune height
- Theoretical Limitations
 - Adaptive behaviors are assumed to only be a direct function of risk perceptions
 - In previous studies, flood risk perceptions rarely account for the variance explained in models
 - Risk perceptions are a function of various risk factors, insinuating a mediating role of risk perceptions

Research Questions

- 1) What is the role of flood risk perceptions in explaining adaptive behaviors of households?
- 2) What is the mediating role of flood risk perceptions in explaining adaptive behaviors of households?

Proposed Conceptual Framework



Methods

Survey Design

- Survey was conducted in 2015
- Randomized telephone surveys
- Contains 41 questions related to the perceptions, experiences, and adaptive responses of households
- Total response n = 1,978

Data Analysis

- Path Analysis was used to test the direct, indirect, and total effects of the various relationships between risk factors, flood risk perceptions, and adaptive behaviors of households

Research Context

- Survey data were collected in Portsmouth, VA
- Portsmouth is a city vulnerable to sea level rise, storm surge, and increased flooding

Preliminary Results

	Direct Effects		Indirect Effects	Total Effects		Mediation
	Risk Perceptions	Adaptive Behaviors		Risk Perceptions	Adaptive Behaviors	
Personal Characteristics						
Age	-	-	-	-	-	None
Income	-	-	-	-	-	None
Residency	-	-	-	-	.002*	Full
Tenure						
Race	-.133*	.079*	0.00*	-	.079*	Partial
Proximity						
100 Feet	-	.144*	-	-	.154*	Partial
200 Feet	-	.021*	-	-	-	None
300 Feet	-	-	-	-	-	None
Experience						
In/Out of Neighborhood	.165*	.055*	-	.165*	.059*	Partial
Suffered Damage	.628*	-	.014*	.628*	-	None
Flood Frequency	.798*	.458*	.017*	.798*	.467*	Partial
Knowledge						
SLR and Flood Related	2.04*	-	.086*	2.04*	.118*	Full
Locus of Responsibility						
Individual or Gov't?	-.674*	-	-.027*	-.674*	-.065*	Full

Note: *p < 0.05; reported coefficients are standardized
 * if reported with "-" it is nonsignificant
 * age, income, and race were used as control variables in models 2-5

Preliminary Insights

- ❖ Risk perceptions interact within various relationships between flood risk factors and adaptive behaviors of households
- ❖ Some processes may be systematic while others are peripheral routes to persuasion
- ❖ Risk perceptions is a mediating mechanism in which various households use to influence their decision to engage in adaptive behaviors to flooding

Implications

- ❖ Multi-equation statistical analyses are better suited for analyzing the complex relationships that explain adaptive behaviors to flooding
- ❖ Flood managers may use risk perceptions as a means to target the relationship where partial and full mediation occur
- ❖ Where mediation does not occur, flood risk managers may use risk communication to address the direct relationships without regard to influencing perception
- ❖ This builds on our understanding of how social psychology can be used to understand how households engage in public policies (e.g., National Flood Insurance Program)

Future Research

- ❖ Future research should include panel data that may better capture time dimensions to substantiate causal ordering of relationships

References

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