

Regional Differences in Cognitive Dissonance in Evacuation Behavior at the Time of the 2011 Japan Earthquake and Tsunami

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Abstract

This paper constructs an evacuation decision-making model that takes cognitive dissonance into consideration. The purpose of this construction is to clarify the psychological mechanism for the evacuation behavior of residents during an emergency, based on Akerlof and Dickens (1982). Specifically, we empirically explore people’s psychological mechanism (e.g. cognitive dissonance) for evacuation behavior when a tsunami disaster occurs. As a result, we show that the level of anxiety depends on the area where residents live and that the average anxiety of residents is mostly correlated to the level of damage of past disasters, and that it is affected also by the ages of residents. Since the level of anxiety largely affects an individual’s evacuation behavior, this result can indicate for what kinds of people intervention and assistance are required based on the level of anxiety.

Full Text

This preprint is available for [download as a PDF](#).

Figures

3 rd stage	<u>No purchase (stay)</u> eq(9)	<u>Purchase (evacuate)</u> eq(8)
2 nd stage	<u>Subjective probability</u> eq(7)	<u>Subjective probability</u> eq(6)
1 st stage	<u>Subjective probability < Threshold value</u> eq(3)	<u>Subjective probability > Threshold value</u> eq(2)

Figure 1

The behavior-decision process

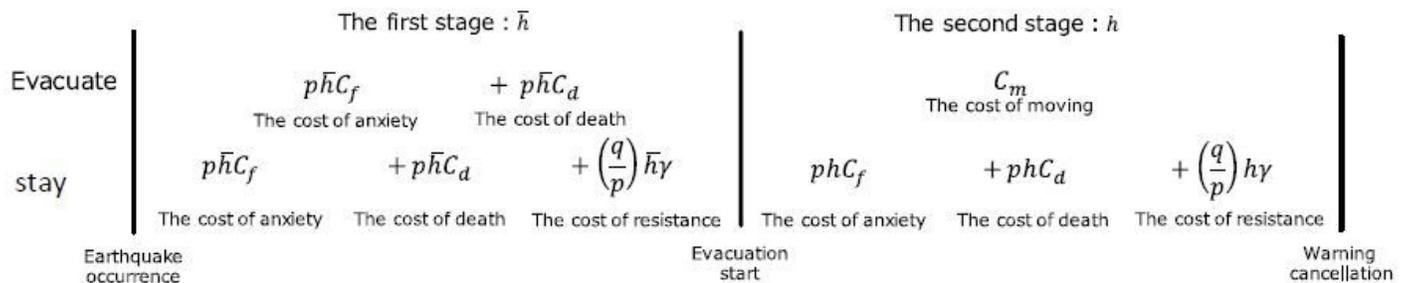


Figure 2

Summary of the model

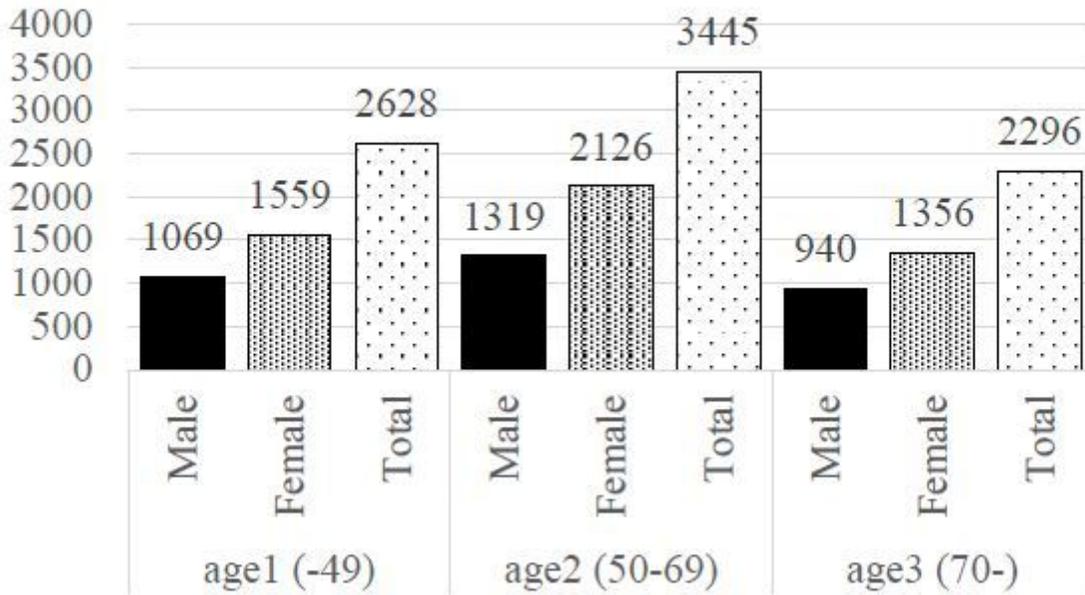


Figure 3

Number of samples by age group

Figure 4

Evacuation rate by age group

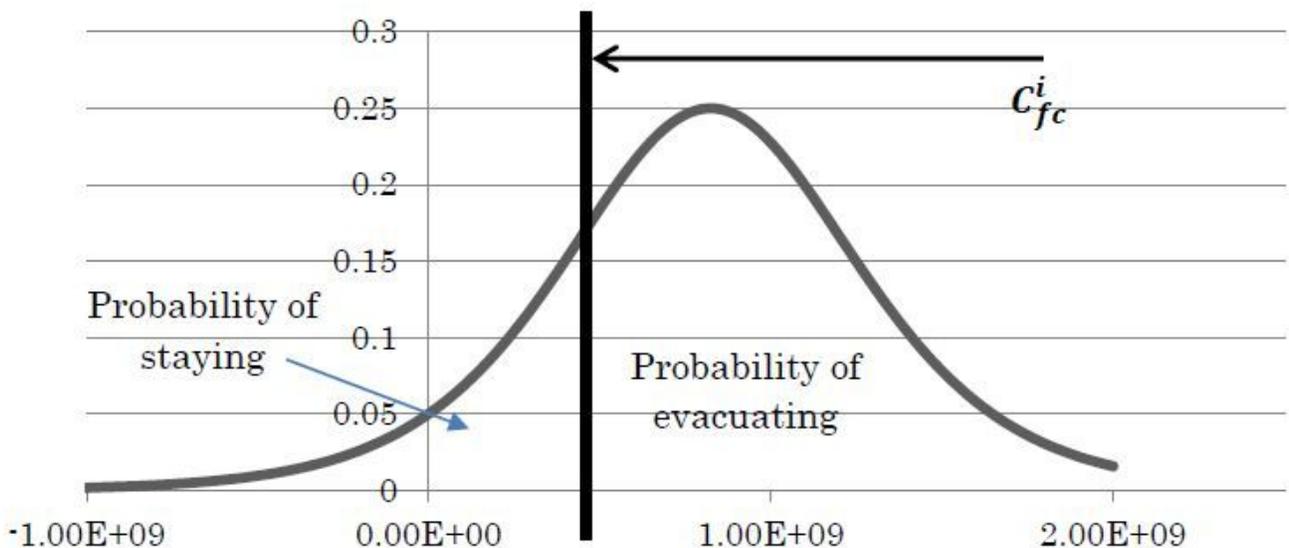


Figure 5

The relationship between the cost of anxiety threshold value and probability

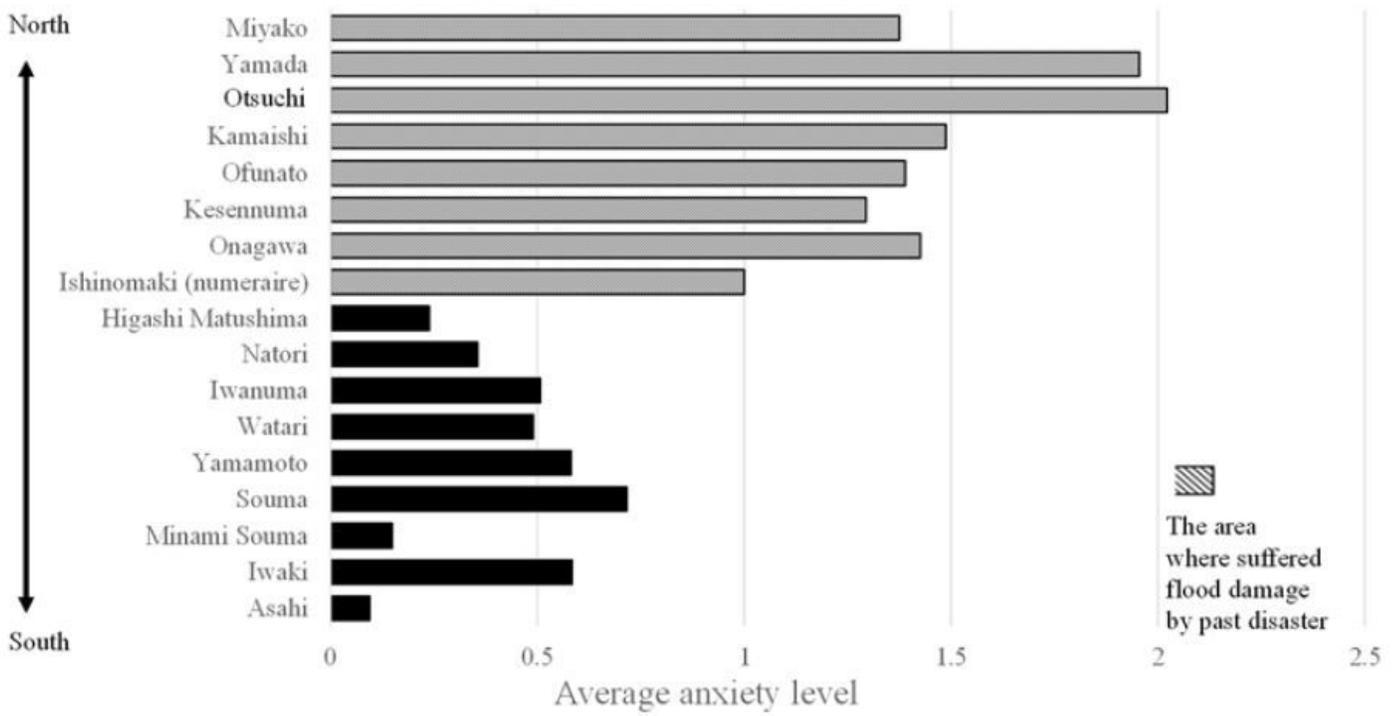


Figure 6

Average anxiety level by area

Run-up height
in previous disasters

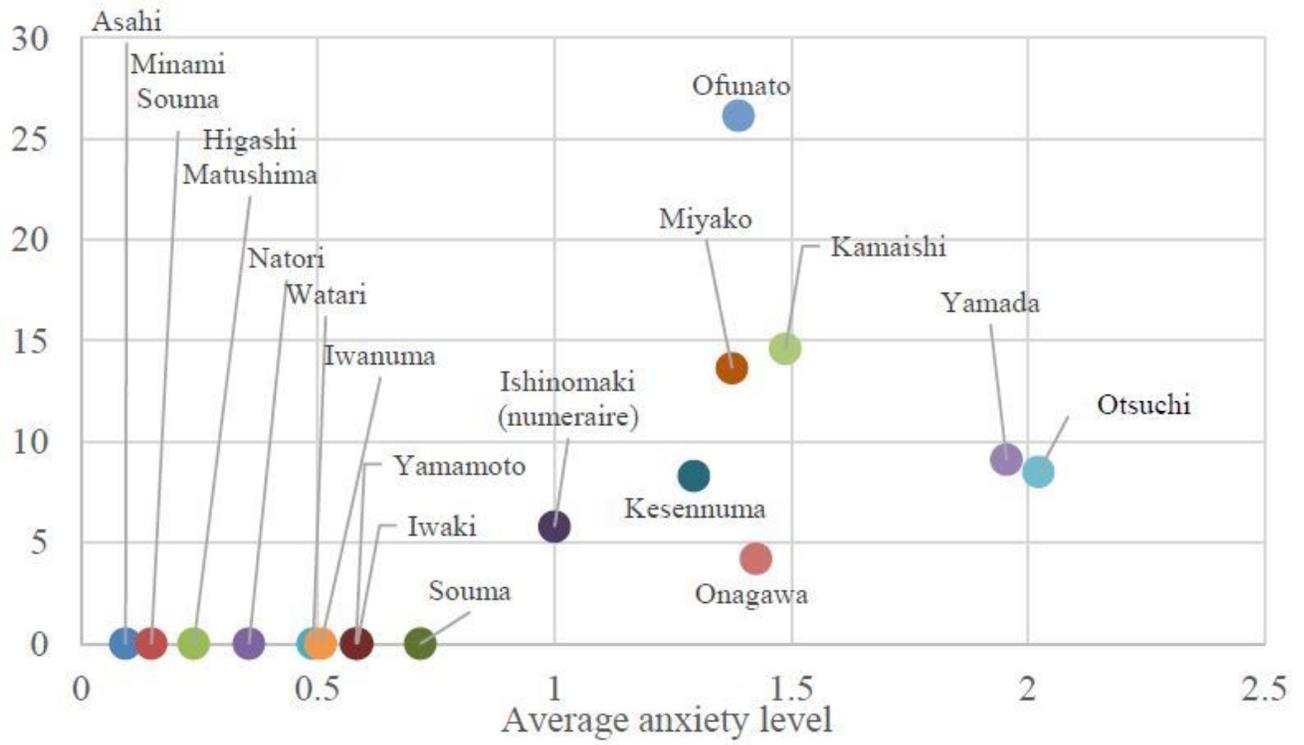


Figure 7

Relationship between maximum run-up height and average anxiety level

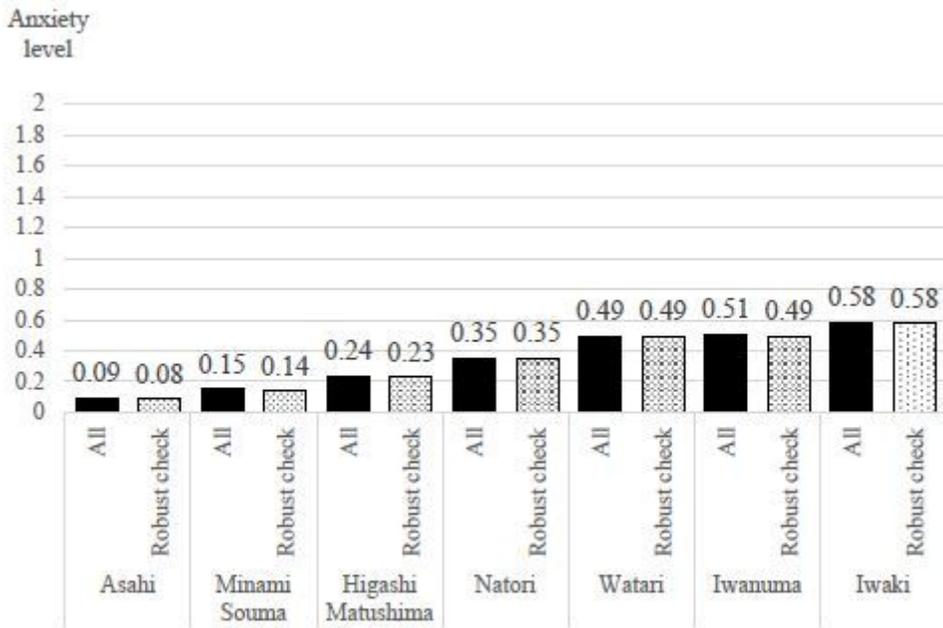


Figure 8-1 Comparison of average anxiety level (part 1)

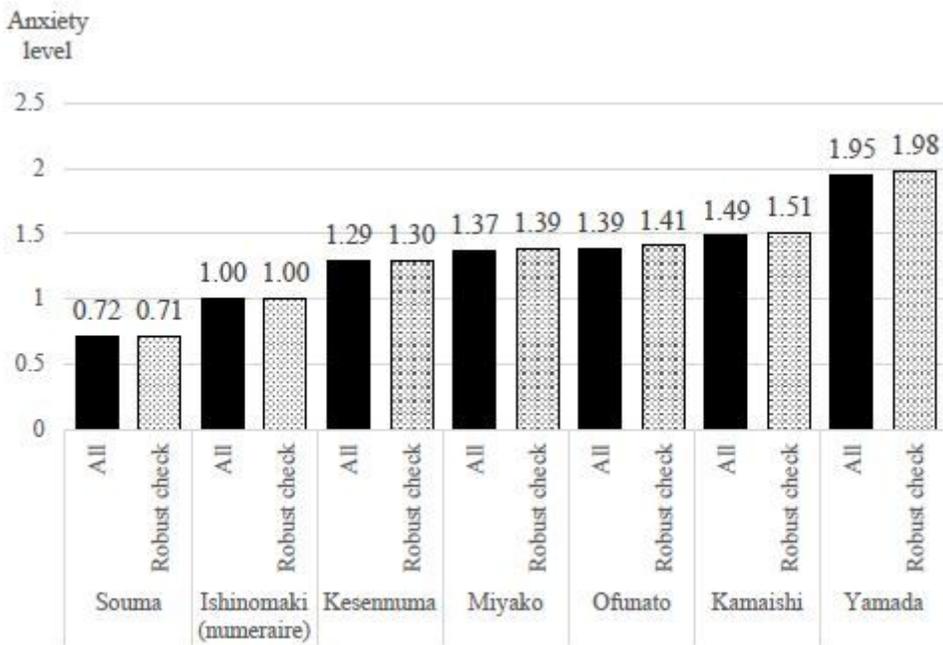


Figure 8-2 Comparison of average anxiety level (part 2)

Figure 8

1 Comparison of average anxiety level (part 1) 2 Comparison of average anxiety level (part 2)