The Role of Emotions on People’s Behaviour in Emergencies

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The Role of Emotions in Emergencies

- Background
- Our study
  - Data collection
  - Data Analysis
  - Discussion
- Conclusion
The triple disasters in Japan in March, 2011 (Earthquake & Tsunami)
The triple disasters in Japan in March, 2011 (Tsunami)
The triple disasters in Japan in March, 2011 (Before the Tsunami)
The triple disasters in Japan in March, 2011 (After the Tsunami)
The triple disasters in Japan in March, 2011 (Fukushima Nuclear accident)
Casualties
(National Police Agency, August 8, 2014)

- 18,498 people (who died or are missing)
NHK’s Study (2011)
Miyagi Pref. where Yuriage town is located

- Survivors (n=600) interviewed
- 2:46 pm – Earthquake
- 3:55 pm – Tsunami
- 700 out of 5600 residents failed to escape.
Map of the distribution of casualties

- Blue-household with no casualty
- Yellow-household with some casualties
- Red-household with no survivors
Map of people’s behaviour in Yuriage
(2:00) http://v.youku.com/v_show/id_XMzEwMTQzNTUy.html
## The Role of Emotions (Fredrickson, 2001)

<table>
<thead>
<tr>
<th>Positive emotions</th>
<th>Negative emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A sign that things are going well.</td>
<td>A sign that there is something wrong.</td>
</tr>
<tr>
<td>Have a broader sense of options</td>
<td>Have restricted sense of options.</td>
</tr>
</tbody>
</table>
The Role of Emotions
(Aspinwall, 1998; Norem & Chang, 2002)

- People with positive emotions can:
  - fail to take a precautionary approach
  - underestimate the probability of risks
  - overestimate their likelihood of achieving desired outcomes.
Rationale

- Few studies on the relationship between emotions and the number of options when people face an emergency.
- Few studies on the role of emotions in people’s decision-making to stay or evacuate in the triple disasters in Japan.
Research Questions

- To what extent did the participants’ emotions predict the number of options they had in mind at the time of the triple disasters?

- To what extent did the participants’ emotions predict their decision to stay or evacuate?
Instrument (Questionnaire)

- Positive & Negative Emotions (10 items each)
- Options
- Decision to stay or evacuate
- Demographic data
### Questant (Web survey)

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>disagree</th>
<th>agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**e.g.,**

(1) I thought that I would be safe without evacuating.
### Questant (Web survey)

<table>
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<tr>
<th>Strongly disagree</th>
<th>disagree</th>
<th>agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

### Examples (e.g.)

1. I thought that I would be safe without evacuating.
2. I thought that the damage from the disasters would spread to my area.
Options (20 in total)

- Examples of options
  - Stay at my own house no matter what happens.
  - Observe the behaviour of other people around me and decide whether to evacuate.
  - Evacuate on my own, if necessary.
  - Evacuate as a whole family.
  - Evacuate within my prefecture.
  - Evacuate outside my prefecture.
Participants (Gender)

- Male: 90 (28%)
- Female: 232 (72%)

n size
Participants (Age)

- 20s: 22 (6.8%)
- 30s: 63 (19.6%)
- 40s: 136 (42.2%)
- 50s: 72 (22.4%)
- 60s: 25 (7.8%)
- 70s and over: 4 (1.2%)

n size
Reliability (Items for emotions)

- Positive emotions ($\alpha = .916$)
- Negative emotions ($\alpha = .877$)
## Factor Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Positive emotions</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Distrust towards authority</td>
<td>-.52</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. A sense of crisis</td>
<td>-.36</td>
<td>.37</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>4. Anxiety</td>
<td>-.24</td>
<td>.11</td>
<td>.17</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Number of Options

Number of Options

0  1  2  3  4  5  6  7  8  9  10  11  12  13  14  15

n size

60  35  27  29  28  33  30  28  19  13  7  4  5  1  2  1
Linear regression

$R^2 = .34, \ F(1, 320) = 161.06, \ p < .001$
Decision to Stay or Evacuate

<table>
<thead>
<tr>
<th>Behaviour</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stayed</td>
<td>278</td>
<td>86.3%</td>
</tr>
<tr>
<td>Evacuated</td>
<td>44</td>
<td>13.7%</td>
</tr>
</tbody>
</table>
## Logistic regression

**Omnibus chi-square = 34.12, df = 4, p < .0005**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig</th>
<th>Exp (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive emotions</strong></td>
<td>1.592</td>
<td>.364</td>
<td>19.140</td>
<td>1</td>
<td>.000</td>
<td>4.915</td>
</tr>
<tr>
<td><strong>Distrust towards authority</strong></td>
<td>-.040</td>
<td>.262</td>
<td>.023</td>
<td>1</td>
<td>.880</td>
<td>.961</td>
</tr>
<tr>
<td><strong>A sense of crisis</strong></td>
<td>-.041</td>
<td>.361</td>
<td>.013</td>
<td>1</td>
<td>.909</td>
<td>.960</td>
</tr>
<tr>
<td><strong>Anxiety</strong></td>
<td>.037</td>
<td>.168</td>
<td>.049</td>
<td>1</td>
<td>.826</td>
<td>1.038</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>-1.014</td>
<td>.679</td>
<td>2.231</td>
<td>1</td>
<td>.135</td>
<td>.363</td>
</tr>
</tbody>
</table>
Discussion

RQ1: To what extent did the participants’ emotions predict the number of options they had in mind at the time of the triple disasters?

- People tended not to seek alternative options when they felt positive about their situation in emergencies.
RQ2: To what extent did the participants’ emotions predict their decision to stay or evacuate?

- People with positive emotions were likely to have stayed.

- People with negative emotions did not necessarily evacuate just because they felt anxious, worried, or doubtful of authority.
The role of emotion – not as simple as one expects

Negative emotions – a positive role in helping people find various ways to protect themselves from potential risks.

Positive emotions – a negative role in preventing people from taking a precautionary approach.

Contexts – important when investigating the role of emotions