TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI
VICTORIA
UNIVERSITY OF WELLINGTON

Effects of Framing on Earthquake Risk Perception

Liv Henrich, John McClure and Michael Crozier

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Introduction

Background

- Preparation can avert damage and loss from earthquakes
- Motivating people to prepare for low frequency events such as earthquakes is difficult
- Framing of low frequency risk events influences risk perception which can influence intentions to prepare (McClure & Sibley, 2011)
- The time frame of a risk affects risk judgments (Yamagishi, 1997)
- People recognise the risk more when framed ad frequencies rather than probabilities (Hoffrage & Gigerenzer, 1998)
- These findings have not been applied to Earthquake (EQ) risk

Questions this study aims to answer

- How do different frames of the same earthquake risk influence people's risk perception?

Method

Framing and Risk Perception

5 logically equivalent statements describing EQ risk in 5 cities:

1. **An earthquake that occurs every 500 years kills 1600 people.**
2. **There is a 10% chance in 50 years that 1600 people are killed.**
3. **The average risk of death by earthquake is 3.2 people per year.**
4. **An average of 19 out of every one million people are killed in a year.**
5. **The average chance of a person dying each year is 1.9 per 100,000.**

Study 1

- Participants rank ordered the 5 cities based on which statement conveyed the highest risk

Study 2

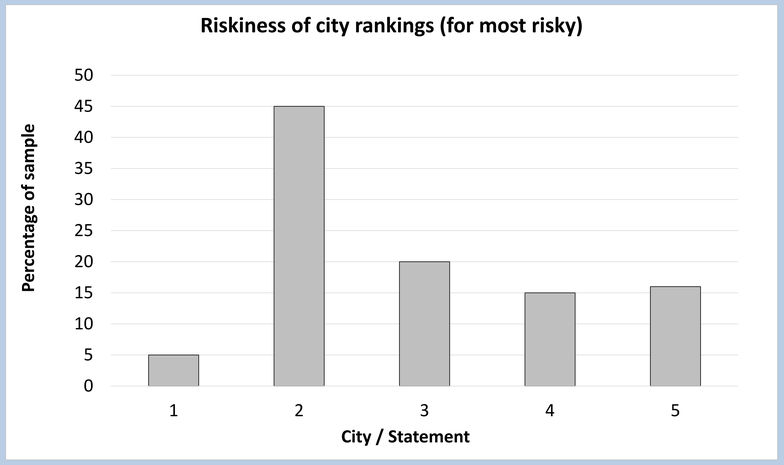
- Participants rated the earthquake risks of five cities on a 7-point Likert scale (1= Not at all risky; 7= Extremely risky)

Results

Framing and Risk Perception

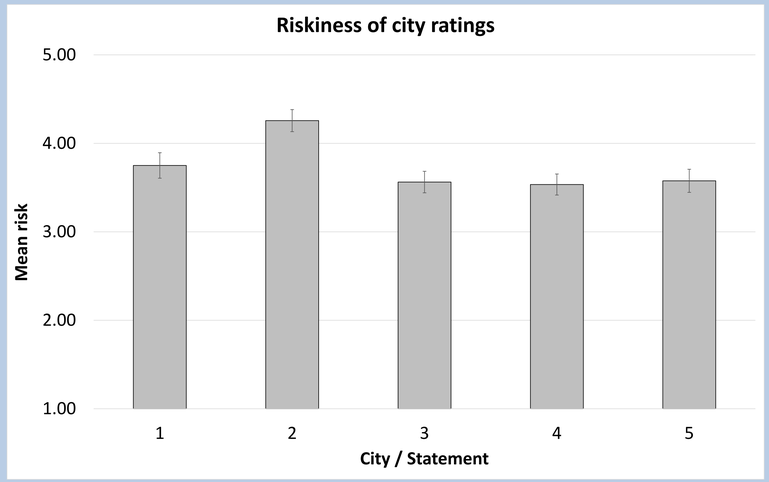
Study 1

- 45 % of participants ranked statement 2/ city 2 (" There is a 10% chance in 50 years that 1600 people are killed") as most risky



Study 2

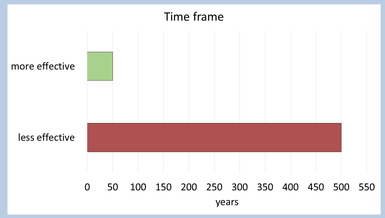
• Statement 2 (" There is a 10% chance in 50 years that 1600 people are killed") was rated significantly more risky sounding



Discussion

1. **Different descriptions of the same earthquake risk affect people's risk perceptions**

- More effective risk statements use a time frame that lies within people's life time (Yamagishi, 1997):



- **50 years** rather than **500 years.**

- and present the risk as frequencies rather than probabilities (Hoffrage & Gigerenzer, 1998):

Frequencies:
"There is a 10% chance in 50 years that **1600 people** are killed."

$$P(a) = \left[\sum_{i=0}^{a-1} \left(\frac{1-p}{p} \right)^i \Big/ \sum_{i=0}^{a+b-1} \left(\frac{1-p}{p} \right)^i \right]$$

Probabilities:
"The average chance of a person dying each year is **1.9 per 100,000**."

References

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