After the virtual flood:
Risk perceptions, emotions and preparedness after flood risk communication in virtual reality

Jantsje M. Mol[1] W. J. Wouter Botzen[1,2,3] Julia E. Blasch[1]

[1] Institute for Environmental Studies, Vrije Universiteit Amsterdam, The Netherlands, [2] Utrecht University School of Economics, The Netherlands, [3] Risk Management and Decision Process Center, The Wharton School, University of Pennsylvania, USA

INTRODUCTION

We know from previous survey research that the strongest predictors of flood preparedness are emotions, coping variables and personal norms. Generally, homeowners with (recent) flood risk experience are better prepared, which is mediated through emotions and a better understanding of the consequences of flooding.

This research uses virtual reality technology to examine whether a simulated flood can improve flood preparedness.

Can we boost risk perception, efficacy, worry and behavior (flood risk investment game) through a VR flooding experience? We use a repeated-measures design to examine:

- whether these effects last
- whether respondents have engaged in flood preparedness behavior at home by installing (more) measures

METHOD

Participants will be recruited by company Panelinzicht to visit the lab in Amsterdam. They will start with a short survey and get instructions about the VR goggles. During the intervention they will visit a typical Dutch home that will be flooded. They can prevent damage by installing shutters/sandbags and by collecting valuables. Subsequently, they will experience the damage at the neighbors who did not take any preventive measures. The lab visit ends with survey questions and the flood risk investment game. We collect additional information in a follow-up survey 6-8 weeks later (online). The results are compared to a control sample (online, without VR intervention).

Dutch homeowners (representative sample)
online (August 2019, n = 300, 15 min)

Survey questions
- Demographics
- Risk and time preferences
- Flood risk perception
- Measures at home

CONTROL (NO INTERVENTION)

- Coping variables — H1a
- Worry — H1b

Flood risk investment game — H1b

Amsterdam citizens (representative sample)
lab (June 2020, n = 100-150, 30 min)

Survey questions
- Demographics
- Risk and time preferences
- Flood risk perception
- Measures at home

VIRTUAL REALITY INTERVENTION
1. participant in home, gets flooded, action
close shutters, place sandbags, collect valuables
2. inaction: watch damage at neighbors

- Presence (in VR)
- Coping values
- Worry

Flood risk investment game

(6-8 weeks later)

online (August 2020, n = 70, 10 min)

Survey questions
- Flood risk perception
- Worry — H2a
- Coping variables — H2b
- Measures at home — H2c

HYPOTHESES

H1a Coping: VR intervention > control sample
H1b Worry: VR intervention > control sample
H1c Flood game: VR intervention > control sample

<u>6-8 weeks after the VR intervention:</u>
H2a Lower worry
H2b Same coping values and flood game investments
H2c More measures installed at home

VU Vrije Universiteit Amsterdam | IVM Institute for Environmental Studies | NETWORK INSTITUTE

scan to go to my website: www.jantsje.nl @JantsjeMol