

11TH INTERNATIONAL CONFERENCE

ON CRITICAL INFORMATION
INFRASTRUCTURES
SECURITY

10-12 October 2016
UIC HQ Paris



CRITIS
2016

Behavioral intentions and threat perception during terrorist, fire and earthquake scenarios

Simona Popușoi^a, Cornelia Măirean^a, **Grigore Havârneanu^b**

^a *Alexandru Ioan Cuza University of Iasi, Romania*

^b *International Union of Railways (UIC), Security Division, Paris,
France*



ALEXANDRU IOAN CUZA
UNIVERSITY of IAȘI



INTERNATIONAL UNION
OF RAILWAYS

The “human” in Human Factors

- EU BeSeCu project (Behaviour, Security, Culture)
- EU Getaway Project
- EU IMPROVER project

Psychological literature on:

- risk perception (e.g. work of Sjöberg)
- citizen response to disasters and threat (e.g. Hesloot & Ruitenber, 2004)
- mass panic (e.g. Mawson, 2005)
- collective responses (Grimm et al. 2014)
- individual factors

Locus of control (LOC) – Rotter, 1966

- an expression of the relation between an individual and its environment

Internal



Individuals believe that they control their own destiny

External

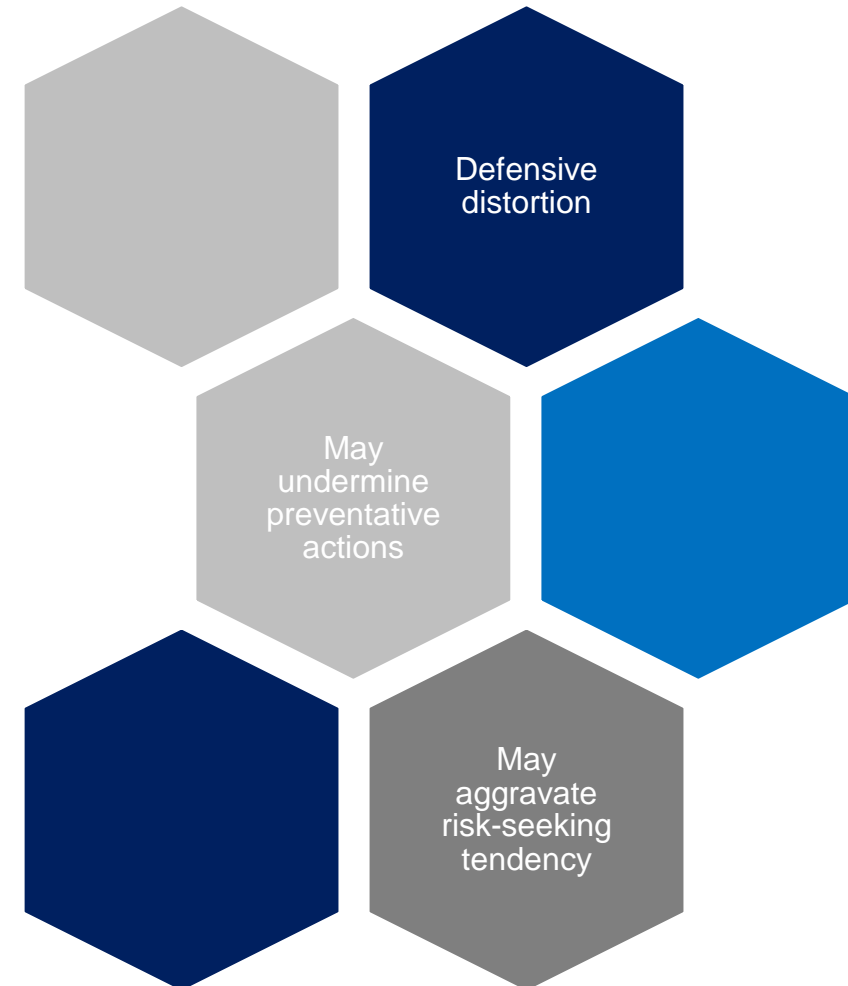


Individuals consider fate or powerful others to be in control over the outcomes of their behavior

Individuals with internal LOC tend to be more proactive in taking preventative measures against security breaches (Tu et al. 2014)

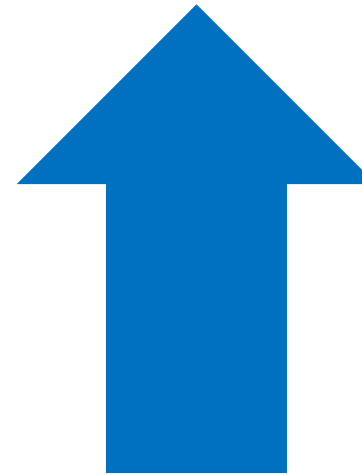
Optimism bias (Weinstein & Klein, 1996)

- The underestimation of the likelihood of experiencing negative events
- A perception of personal invulnerability
- “It won’t happen to me...” type of thinking



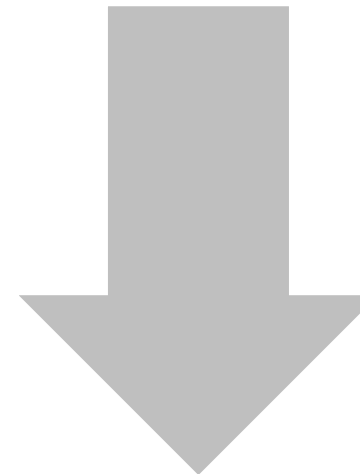
Illusion of control (Langer, 1975)

- One's tendency to perceive that they have more control over their own behavior or over the environment than they can actually have.



Overestimate personal control in chance-determined situations

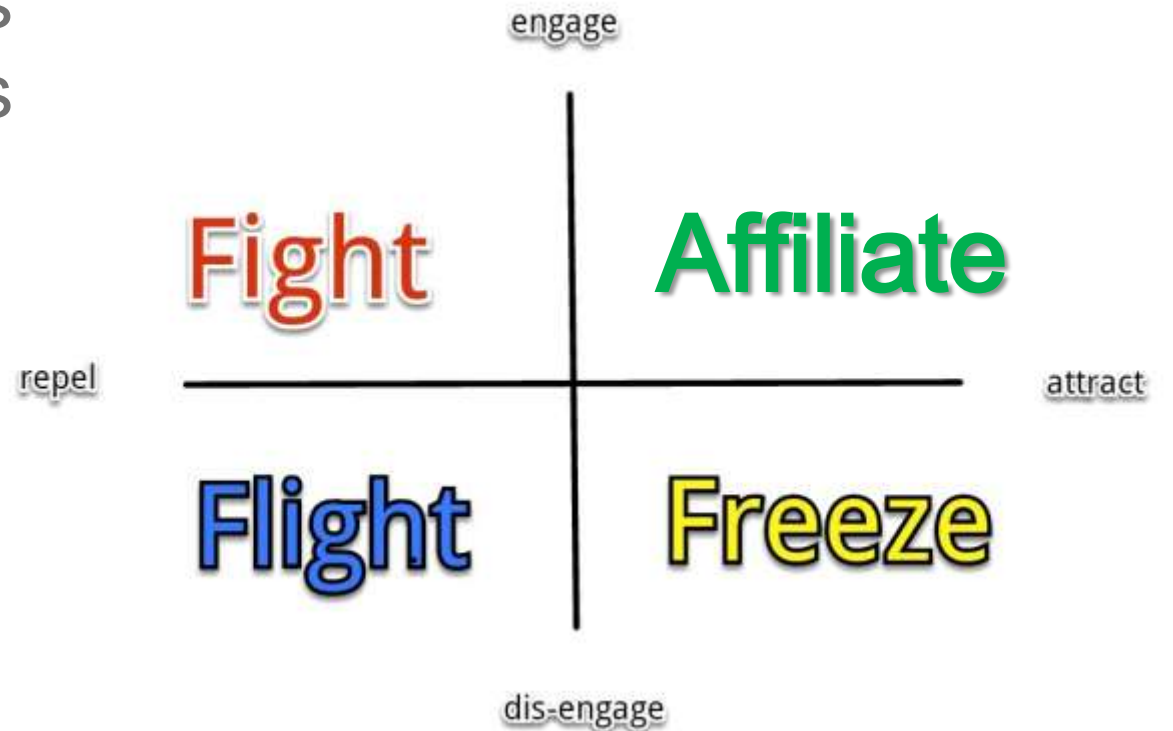
(e.g. Gino et al. 2011)



Underestimate personal control when they have indeed a great deal of objective control

Individual's reactions during critical incidents

- Citizen response during disasters, major accidents or terrorist attacks can be broken down into 3 stages (Hesloot & Ruitenbergh, 2004):
 - alarm stage
 - acute stage
 - recovery stage



Aims of the study

Explore if individual factors:

- LOC,
- optimism bias,
- illusion of control,
- knowledge about crisis management, and
- institutional trust

are likely to influence the threat perception and the behavioral intentions during three types of crisis situations.

Sample:

- 249 university students
- Mage = 22.35 (SD = 5.47)

Scenario:

- terrorist bomb attack
- fire
- earthquake

Method

Pre-scenario measures

- Emergency knowledge
- LOC
- Optimism bias

Scenario manipulation

- Six experimental conditions, based on scenarios that manipulated 3 types of crisis situations (terrorist bomb attack, fire, and earthquake) and the presence of other people: close friends (in-group) and strangers (out-group).

Post-scenario measures

- Behavioral intentions
- Threat perception
- Perceived control
- Institutional trust

Scenario: a flash disaster in a crowded public building (i.e. shopping center)



Scenario example (bomb attack, in-group)

"It's Saturday night and you're out with a group of friends at Palas Mall. A long awaited concert will begin at 20:00 in the Atrium area. You get there at 19:30 and you notice that all the 150 seats in the front of the stage are occupied. In the Atrium area are more than 500 people: some are waiting for the concert, others are shopping, and all the seats at the nearby café are taken. There are already too many people to move next to the stage, so you and your 3 friends decide to stay in the back, where people flock less. Half an hour after the concert started, a bomb explodes in front of the stage. The glass ceiling breaks instantly and the splinters fall over the crowd. Parts of the metal structure collapse in a cloud of dust and smoke. The noise is deafening. Everyone screams in the instantly created panic. You see dozens of people losing their lives and others heavily injured. One of your friends is hit by a piece of metal and falls seriously injured. You and your other friends are injured but still do not know how badly. Everything happened very quickly, there are only 2 or 3 minutes since the terrorist attack occurred".



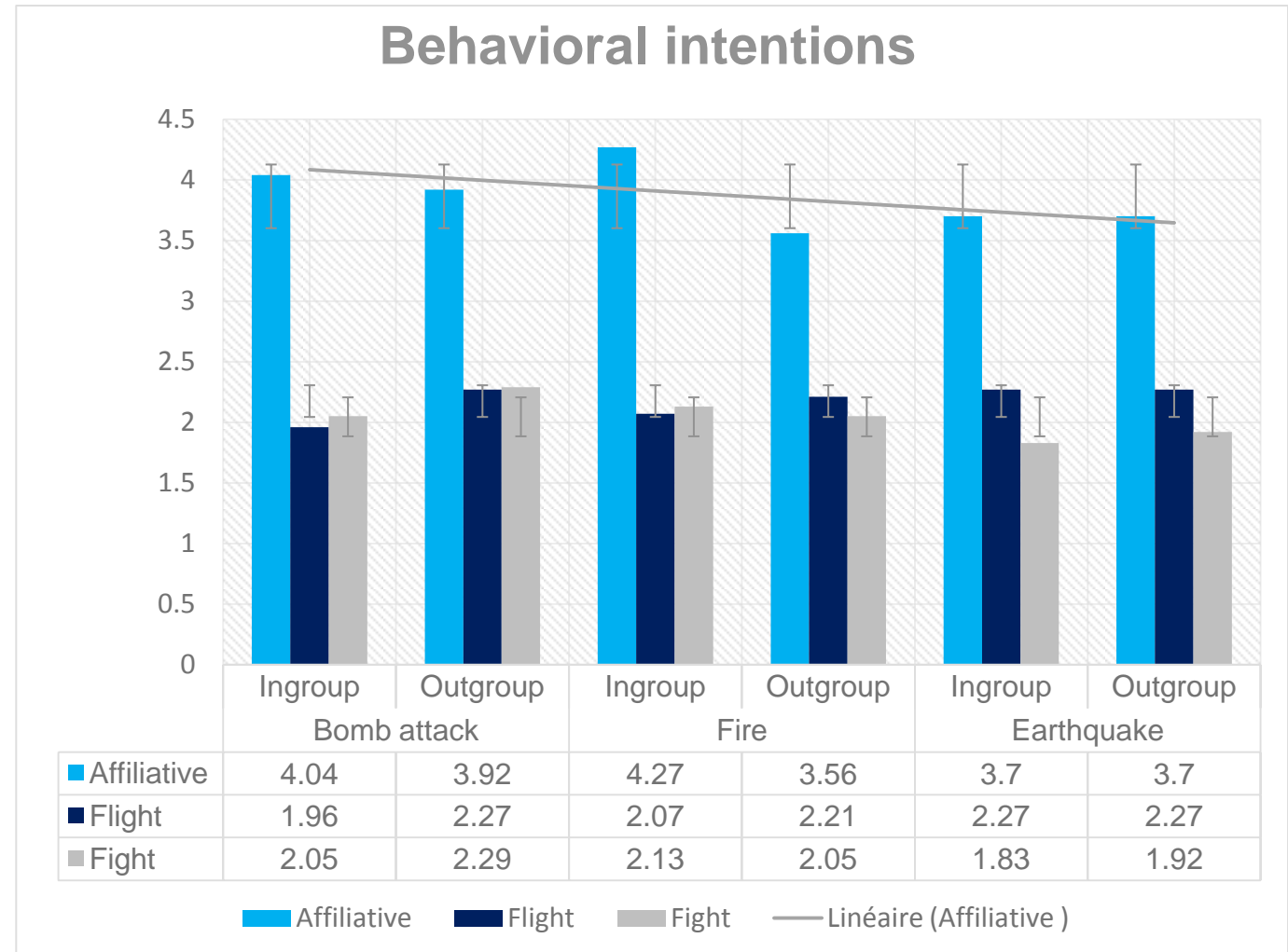
Results (mixed ANOVA)

Between-subjects factor:

- Type of crisis scenario (bomb, fire, earthquake)

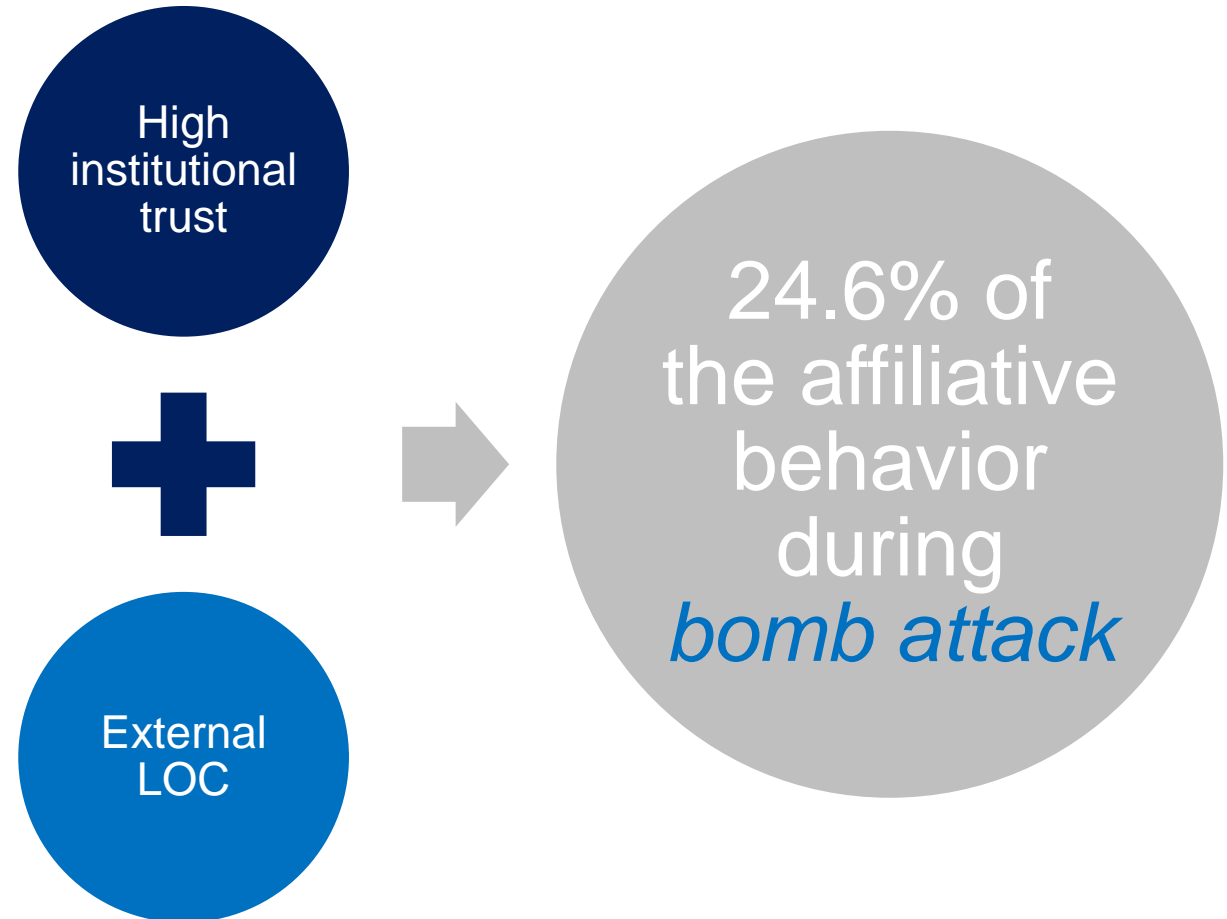
Within-subjects factor:

- Behavioral intention (fight, flight, affiliation)



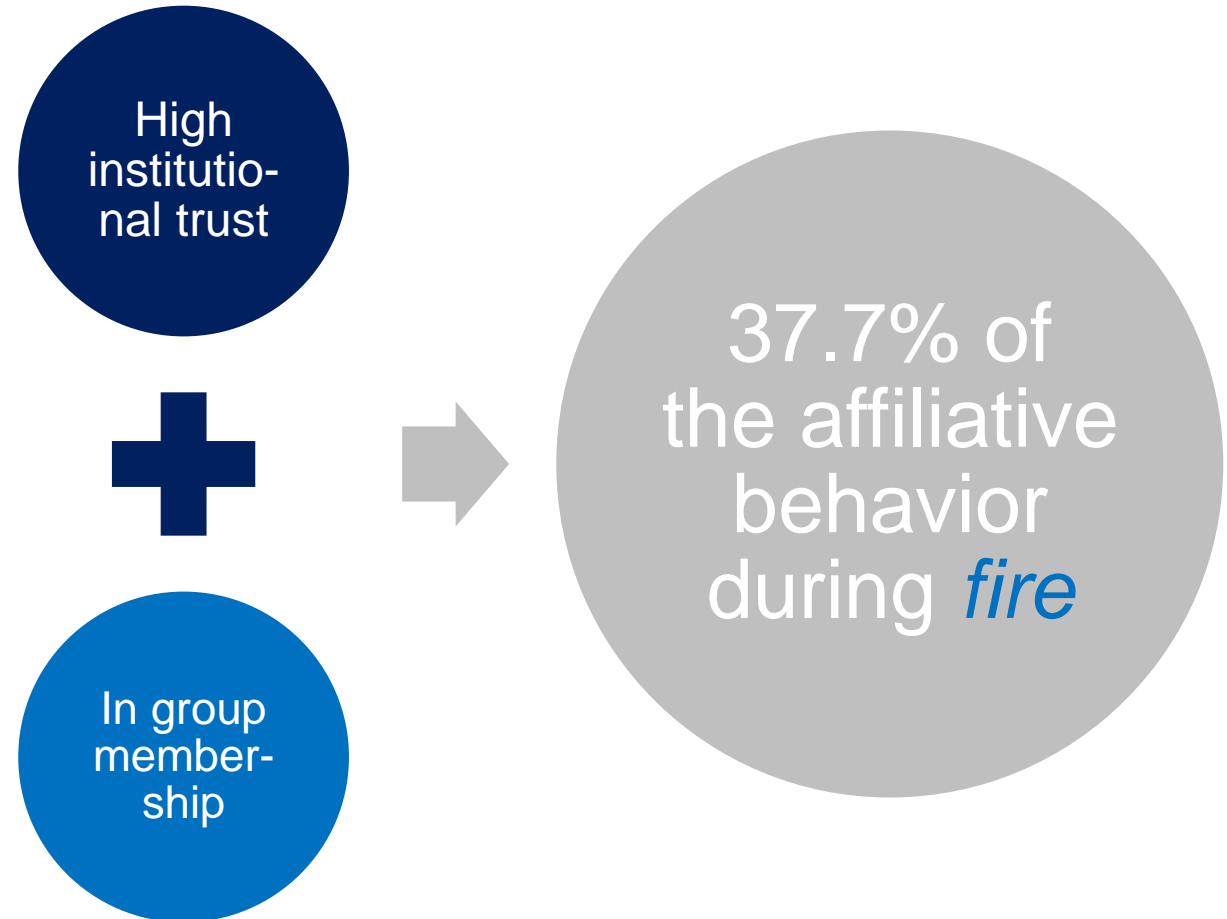
Results (Stepwise linear regressions)

- Prediction models for the affiliative behavior
- Predictors:
 - group type (in group vs outgroup)
 - LOC
 - optimism bias
 - knowledge level
 - perceived control
 - institutional trust



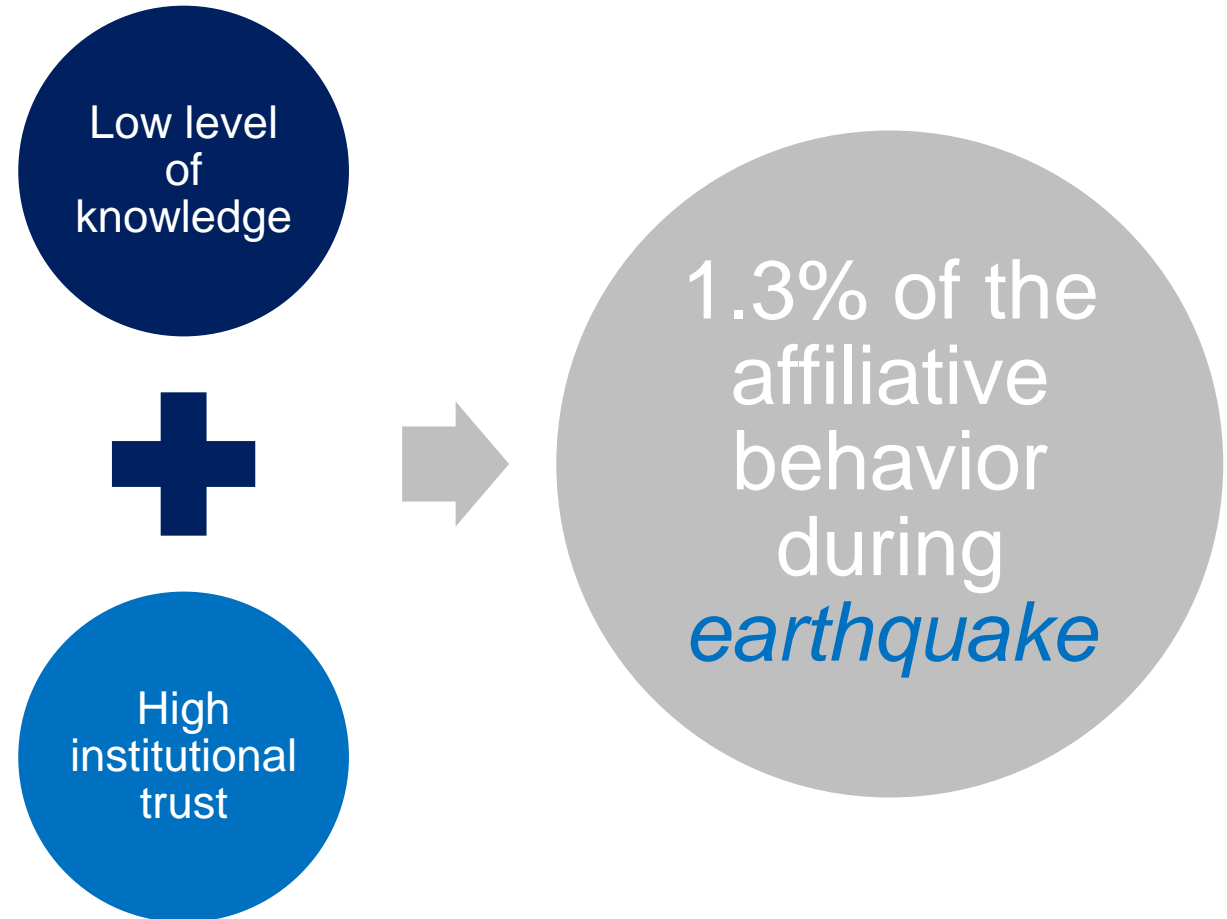
Results (Stepwise linear regressions)

- Prediction models for the affiliative behavior
- Predictors:
 - group type (in group vs outgroup)
 - LOC
 - optimism bias
 - knowledge level
 - perceived control
 - institutional trust



Results (Stepwise linear regressions)

- Prediction models for the affiliative behavior
- Predictors:
 - group type (in group vs outgroup)
 - LOC
 - optimism bias
 - knowledge level
 - perceived control
 - institutional trust



Conclusions

Panic does not take over the rational behavior

Seeking proximity & helping others

Affiliative behavior

Social attachment model of collective behavior

Delay in taking appropriate evacuation actions

Conclusions

External LOC: the responding bodies can manage the situation

Optimism bias ?

Institutional trust

Illusion of control ?

Level of knowledge ?