

# Protection Motivation Theory (PMT) & Links to DCU Based Research

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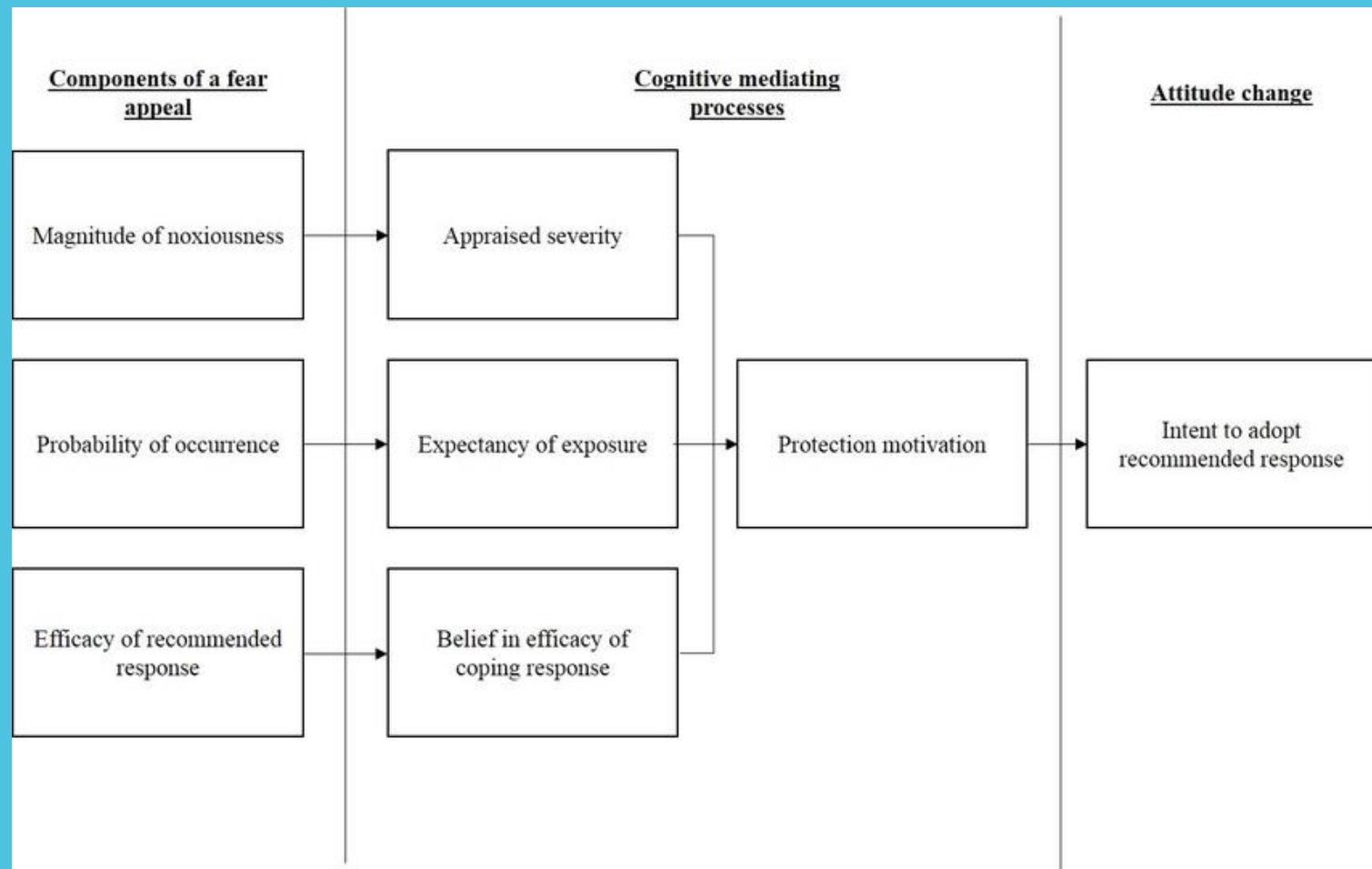
# Origins & Basis of PMT

- Protection motivation theory founded by Rogers (1975) – based on expectancy-value theory
- Originally to better understand “fear appeals”.
- “Fear Appeals” are “Communications that attempt to change our attitudes by appealing to that unpleasant emotion of fear” (Rogers, 1983, p153)
- PMT was extended by Rogers (1983) to a more general theory of persuasive communication by adding reward & self efficacy components
  
- Protection motivation stems from both the threat appraisal and the coping appraisal.
  
- Protection Motivation Theory suggests that individuals protect themselves based on 4 factors:
  1. the perceived probability of the occurrence
  2. the perceived severity of a threatening event
  3. the efficacy of the recommended preventive behaviour
  4. perceived self efficacy **Sometimes a 5<sup>th</sup> is added**
  5. response cost

# Protection Motivation & Action

- These cognitive processes “mediate the effects of the components of fear appeals on attitudes by arousing what has been termed “protection motivation”. (Rogers, 1983, p158)
- “The intent to adopt the communicator’s recommendation is a function of the amount of protection motivation aroused.” (Rogers, 1983, p158)

# A Schema of PMT (Poong, 2016)



# Threat Appraisal - perceived probability of the occurrence

- Sometimes term perceived vulnerability is used
- Refers to perceived expectation of being exposed to a particular threat/risk
- Akin to likelihood when completing a risk assessment

# Threat Appraisal - perceived severity of a threatening event

- Also referred to as magnitude of noxiousness
- Estimate of how harmful the consequences of exposure will be
- Akin to Impact when completing a risk assessment

# Coping Appraisal

- Takes place only after a threat appraisal has been undertaken
- An individual will only complete a coping appraisal once a certain threshold of threat appraisal has been reached
- “a minimum level of threat or concern must exist before people start contemplating the benefits of possible actions and ruminate their competence to actually perform them” (Schwarzer, 1992. In: Grothmann & Reusswig, 2006, pp105-6)

# Efficacy of the Preventive Action & Perceived Self Efficacy

- Coping Appraisal has 3 components:
  1. A belief that the recommended action will be effective – will protect against harm (efficacy of the recommended preventive behaviour)
  2. A belief that the individual can actually perform or complete the recommended action(s) – (perceived self efficacy)
  3. Perceived cost of the recommended action



# Basically...

- “any source of information about a threat... initiates a threat appraisal process and a coping appraisal process”. (Rogers, 1983, p173)
- Widely used theory in preventive health.
- Examples include anti smoking campaigns, diabetes, campaigns centred on limiting alcohol consumption.
- Based on the idea that disease prevention campaigns are more effective when negative appeals are utilised.
- “studies of fear-arousing communications published between 1953 and 1980 showed that increases in the perceived level of fear consistently resulted in increases in acceptance of the proposed adaptive behaviour or intention. Also, increments in perceived response efficacy increased the intentions to select the adaptive response.” (Floyd, Prentice-Dunn & Rogers, 2000, p.409)

# Move from Health to Emergency Management

# Studies in Areas Such As:

## Flooding

- Risk Perception & Flood Mitigation Behaviour
- People at Risk of Flooding – why some take action and some do not (Cologne, Germany)
- Perception & Communication of Flood Risk
- Factors influencing flood damage mitigation
- Flooding Experiences in the Netherlands

## Wildland Fires

- What motivates people to protect themselves against wildland fires

## Earthquake Preparedness

- Earthquake preparedness in the USA

# Factors Which May\* Influence Protection Motivation Action

- Age
- Gender
- Marital Status
- Education
- Proximity to Risk (eg close to river, volcano)
- Rural/Urban divide
- Household Income
- Household Ownership
- Previous Experience of Emergency
- Worry or Dread of specific Emergency

\* conflicting evidence from different studies

# Factors Which May\* Decrease PM Action

- Denial
- Wishful Thinking
- Fatalism
- Lack of Knowledge
- Financial Constraints
- Reliance on Public Mitigation (such as flood defences)

\* conflicting evidence from different studies

# In An Irish Context

# Risk Perception & Emergency Preparedness in Ireland: Gender Differences

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# Studies of Risk Perception

“examine the judgements people make when they are asked to characterize and evaluate hazardous activities and technologies.” (Slovic, 1987, p.280)

In this case risk perception in relation to 17 risks which could impact on individuals and/or their homes



# Literature Review – Gender & Risk

- Risks tend to be judged as lower by men than by women (see, for example, Brody, 1984; Gutteling and Wiegman, 1993; Stem et al. 1993; Flynn et al, 1994).
- "Men and women ...seem to worry about the same risks, but women constantly worry a bit more...The differences are seldom very large, but systematic." (Gustafson, 1998, p.806)

## Literature Review – Gender & Risk

- Women tended to have higher disaster expectations, more worry, and higher loss estimations.
- Furthermore, household property and being married were related to threat perceptions, showing that the more individuals have at stake the more threat they perceive. (Karanci et al, 2005, p.255)

## In a similar US Study...

- By Flynn et al (1994), 1,512 Americans were asked to rate 25 risks & indicate whether the risk posed: (1) little or no; (2) slight; (3) moderate; or (4) high risk to society.
- Results showed that the percentage of high-risk responses was greater for women than men on every item.

# Preparedness & Gender

- Males think that they have a greater ability to protect themselves from the effects of a volcano and rate their level of self preparedness as significantly higher than females. (Barberi et al, 2008)

## Some Conflicting Studies

- Gender was a significant predictor for technological hazards, but not for non-technological hazards. (Siegrist et al, 2005)
- Tekeli-Yeşil et al (2010) also found that gender did not show a significant association in the final model.

# Demographics

- Data gathered via questionnaire
- 1584 Usable Responses Received
- Male 49% (n=776)
- Female 51% (n=808)

Note 25.9% (n=553) did not declare gender

# Analysis

Aim:

Estimate the impact of being female on

- (i) Perceived likelihood
- (ii) Perceived impact and
- (iii) Overall risk assessment

*controlling for other socioeconomic factors*

*(age, income, children, household size, rural location, renter, length of occupation)*

# Analysis

- Perceived Likelihood and Perceived Impact
  - Likert scale (1 to 5)
  - Ordered Probit
- Overall Risk Rating
  - Treated as continuous variable (1 to 25)
  - OLS regression



# Natural Risks (impact of female)

	Likelihood	Impact	Overall risk
Flooding	0.247***	0.0001	0.643**
Drought	0.206***	0.053	0.749**
Severe Snow	0.091	0.127**	0.628**
Storm	0.163**	0.174***	0.970***
High Temperature	0.069	0.079	0.439*
Low Temperature	0.110*	0.194***	0.849***

## Technological Risks (impact of female)

	Likelihood	Impact	Overall risk
Fire	0.145**	-0.089	0.245
Disruption to Energy	0.199***	0.214***	1.338***
Nuclear (Abroad)	0.187***	0.102*	1.089***
Radiation (Domestic)	0.304***	0.164***	1.596***
Cyber incident	0.069	0.139**	0.557*

# Civil Risks (Impact of female)

	Likelihood	Impact	Overall risk
Loss of Critical Infrastructure	0.152***	0.240***	1.281***
Infectious Disease (humans)	0.137**	0.034	0.737**
Infectious Disease (livestock)	0.051	0.1	0.646**
Water borne disease outbreak	0.183***	0.146**	1.041***
Food borne disease outbreak	0.167***	0.095	0.852***
Terrorism	0.222***	0.144**	1.241***

# Marginal Impact of Female on Perceived Likelihood of Flooding

i.e. What is the difference in the probability a female will state each risk category compared to a man, assuming the same values for all other variables?

Extremely Unlikely	Very Unlikely	Unlikely	Likely	Very Likely
- 0.082	-0.017	0.039	0.044	0.016
-8%	-2%	+4%	+4%	+2%

# Perceived Preparedness - Analysis

Aim: Estimate the impact of being female on

(i) Perceived preparedness

(ii) Action to protect

*controlling for other socioeconomic factors*

*(age, income, children, household size, rural location, homeowner/renter, length of occupation)*

# Coefficients and significance of 'Female'

Dependent variable	Coefficient (significance)
Preparedness	-0.475 ***
Action to protect	-0.145*

# Marginal impact of 'Female'

## Effect of 'female' on probability of perceived preparedness

No	Somewhat	Yes
0.132	-0.024	-0.107
13%	-2%	-11%

Effect of 'female' on probability of having taken action to protect = - 6%

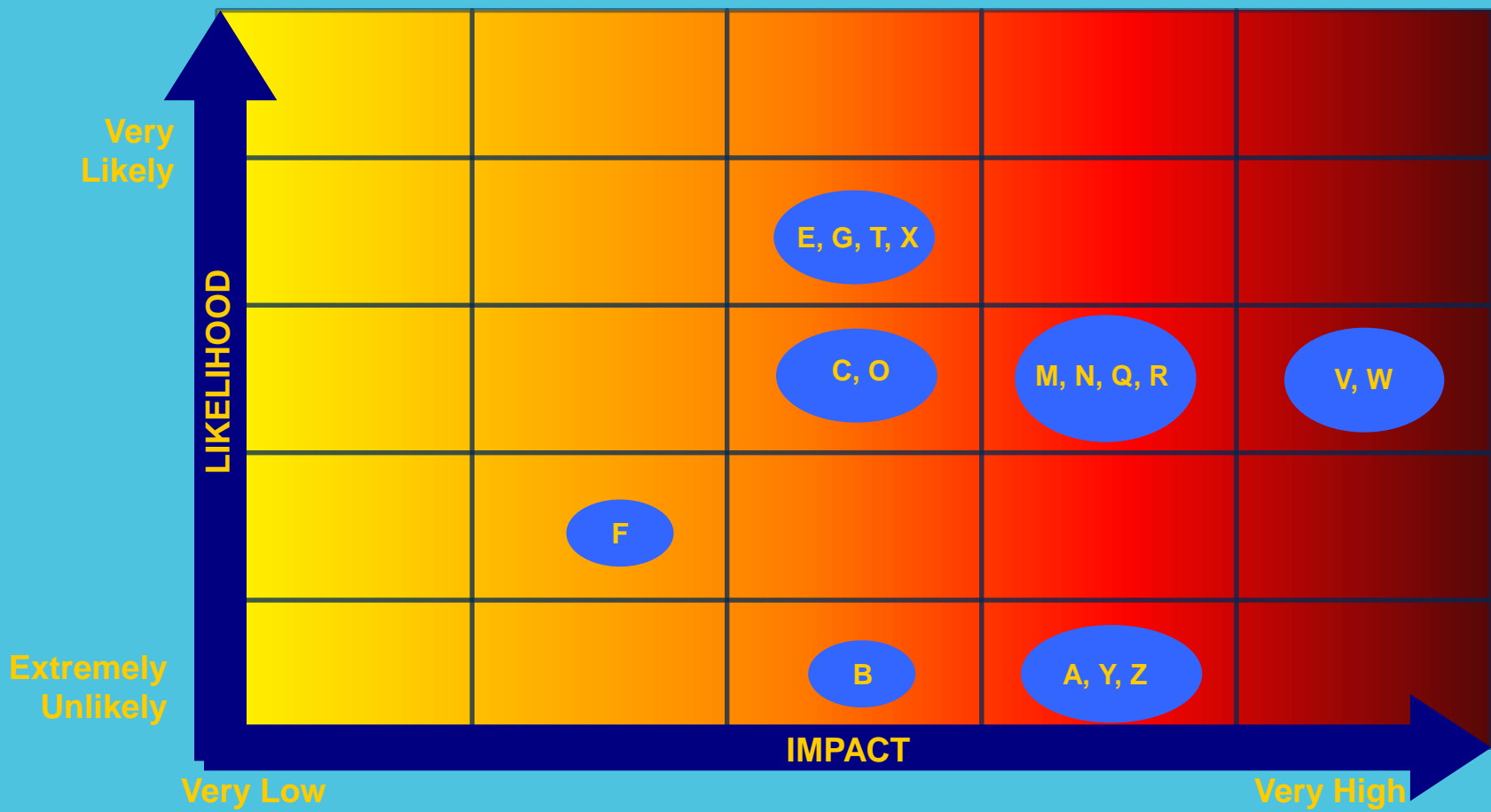
# Reason for Lack of Action

Reason	Male (n=320)	Female (n=389)	Total (n=709)
Don't know what to do (***)	105 (31%)	180 (46%)	285
Haven't had time	60 (19%)	57 (15%)	117
Don't want to think	62 (19%)	60 (15%)	122
Expense	84 (26%)	90 (23%)	174
Won't make a difference (***)	78 (24%)	65 (17%)	143
Emergency services will help	69 (22%)	98 (25%)	167

NB: % refers to the percentage of males (females) who indicated the reason applied to him (her).



# Males Risk Perception Matrix



A: Flooding  
 B: Drought  
 C: Snow

F: High Temp.  
 G: Low Temp.

M: Loss Critical Infrastructure  
 N: Infectious Disease

O: Animal Disease

Q: Water Borne Outbreak

R: Food Borne Outbreak

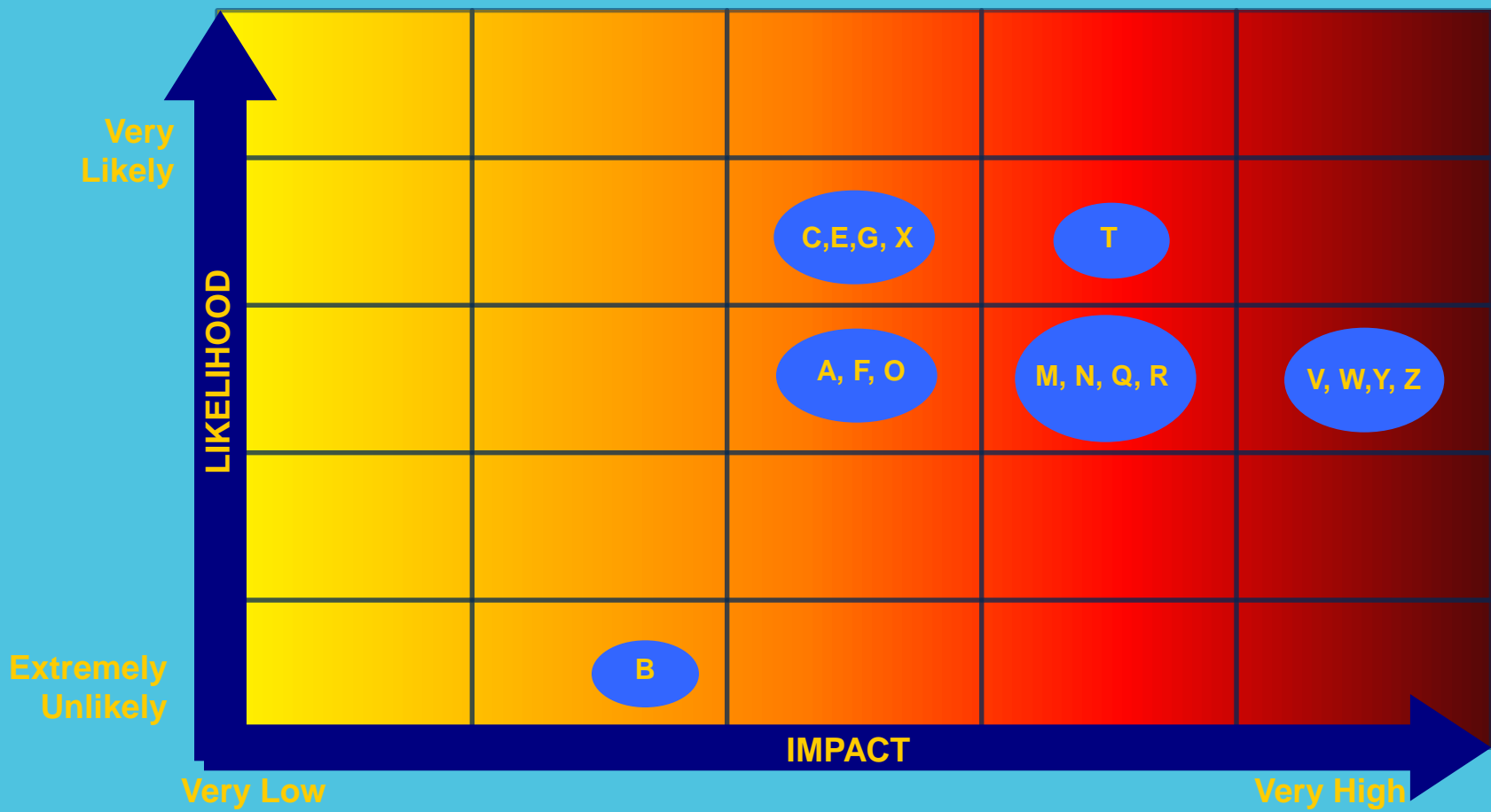
T: Disruption to Energy Supply

V: Fire  
 W: Nuclear (Abroad)  
 X: Cyber Incident

Y: Radiation (Domestic)

Z: Terrorist Activity

# Females Risk Perception Matrix



A: Flooding  
 B: Drought  
 C: Snow

F: High Temp.  
 G: Low Temp.

M: Loss Critical Infrastructure  
 N: Infectious Disease

O: Animal Disease

Q: Water Borne Outbreak

R: Food Borne Outbreak

T: Disruption to Energy Supply

V: Fire

W: Nuclear (Abroad)

X: Cyber Incident

Y: Radiation (Domestic)

Z: Terrorist Activity

# Conclusions

- Gender significantly influences the perceived likelihood, impact and/or overall risk assessment of each of the 17 risks.
- Unlike the Siegrist et al (2005) study, our results indicate that gender is a significant predictor for technological hazards AND for non-technological hazards.

# Conclusions

Women are:

- (i) more likely to perceive a risk,
- (ii) less likely to feel prepared and
- (iii) less likely to have taken action to protect themselves and/or their home.

# Conclusions

- Our results support the finding: "Men and women ...seem to worry about the same risks, but women constantly worry a bit more...The differences are seldom very large, but systematic." (Gustafson, 1998, p.806)

# Citation

- If citing the results of this survey/presentation, please use the following format:

Brown, D.G., Largey, A., McMullan, C., 2016, “Risk Perception & Emergency Preparedness in Ireland: Gender Differences in Risk Assessment”. Emergency Management Research Symposium. Dublin, Ireland.

# Gender References

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# 2017 Irish Study - Interim Results

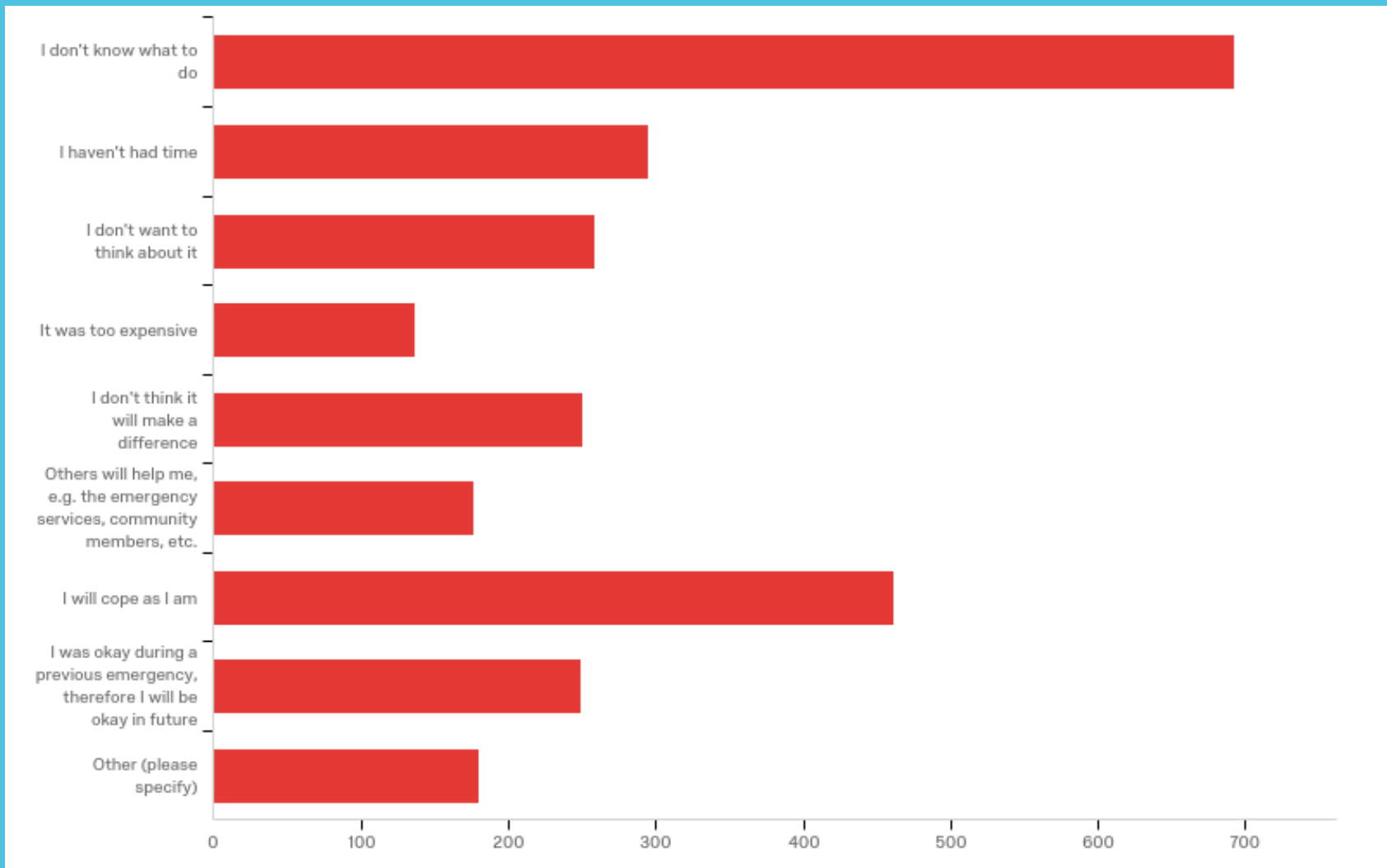
Have you taken any action to protect yourself or your home in case of an emergency?

#	Answer	%	Count
1	Yes	58.19%	2945
2	No	41.81%	2116
	Total	100%	5061

(Source: Brown, McMullan, Largey, 2017, DCU)

# Why have you not taken action to protect yourself or your home in case of an emergency?

(Source: Brown, McMullan, Largey, 2017, DCU)



# References

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