

Why understanding behaviour matters for flood risk management?

In her Editorial of June 2020, Burrell Montz touched upon many of the parallels between managing the global pandemic and flood risk management. Over the recent months, I have also been struck by many of the similarities, particularly in relation to the role of individual decision-making and consequently the behavioural response of those at risk. When watching the recent and ongoing news about the COVID-19 crisis and the actions of us all over these difficult months, I have been reminded of how the impact of human behaviour and our decisions matter for both our individual and collective outcomes. We are all having to make decisions every day about our exposure to risks and behavioural actions we may take to mitigate them (e.g., should I go to the supermarket later in the day as it is less busy? Should I drive to my destination, rather than take public transport? When it is best I wear a mask? Should I accept a vaccine if offered?). The behavioural response of those at risk of flooding can also be of critical importance to both individual and community impact and is a key theme running through many of the papers in this special issue.

Early considerations of the role of perceptions of risk and behaviour in natural hazards research include the 'Human Ecology' work of the 'Chicago School' in the 1960s and 1970s. This seminal work by geographers, and which sparked my own interest in flooding and natural events, started the consideration of the roles and actions of individuals at risk and that the impacts of floods are as much to do with the response and coping mechanisms of both the state and the society affected as the physical processes **experienced** (e.g., Burton, 1965; Burton et al., 1978; Hewitt & Burton, 1971; Kates, 1962; White, 1964, 1974). Behavioural research into natural hazards has developed considerably since these early considerations and encompasses a wide variety of disciplines (e.g., psychology, sociology, political science, philosophy and ethics, etc.). It is widely acknowledged that the relationship between risk awareness, risk understanding, attitudes towards risk and behaviour response are extremely complex (e.g., Garvin, 2001; Slovic, 2000) and

thus encouraging positive behaviour can be challenging. However, in the same way that individual responses are needed to take effective and appropriate action during the COVID-19 crisis, individual and group responses and behaviours are also at the heart of effective flood risk management. Decisions by those at risk (and subsequent action or inaction) span the entire spectrum of flood risk management and may include, as examples, decisions and behaviour concerning: purchasing a property in a flood risk area, action taken to reduce risk, response during an event and actions taken in order to recover.

Understanding behaviour and citizens' behavioural response to risk information is equally, if not more, important as improving our understanding of the flood hazard. Whilst for instance it may be important to undertake research to improve the spatial accuracy of a flood forecast, what use is this if individuals do not believe this forecast or take action to respond effectively? Since its inception, studies in the *Journal of Flood Risk Management* have made significant contributions to understanding flood risk behaviours including in the areas of mitigation influencing behaviours (e.g., Becker et al., 2014; Bubeck et al., 2012; Everett et al., 2018; Slotter et al., 2020), during flood response (e.g., Diakakis et al., 2020; Enriquez-de-Salamanca, 2020; Jonkman & Vrijling, 2008; Neal et al., 2011; Shah et al., 2012), related to communication styles (e.g., Seebauer & Babicky, 2018; Stephenson et al., 2018) and flood recovery (e.g., Ge et al., 2017; Tariq et al., 2014).

A number of papers in this Issue of the *Journal of Flood Risk Management* (Volume 14, Issue 2—June 2021) also add to this valuable collection of research about flood risk behaviour. Both Netzel et al. (2021) and Champonnois and Erdlenbruch (2021) focus on different factors that influence the willingness and uptake of individual flood risk management options in the context of pluvial floods in Germany and Southern France, respectively. Risk perception and knowledge are important determinants in both studies, whilst Netzel et al. (2021) also identify the influence of the education and housing

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2021 The Author. *Journal of Flood Risk Management* published by Chartered Institution of Water and Environmental Management and John Wiley & Sons Ltd.

conditions on flood risk behaviour. Additionally, Champonnois and Erdlenbruch (2021) consider the willingness to pay for measures and the economic viability of the implementation of such measures, recognising this as a significant barrier to effective uptake of measures. Barendrecht et al. (2021) in their analysis of historical flooding in England in particular focus on the role of flood experience on preparedness and the implementation of flood mitigation behaviour. They observe regional differences in their findings, which indicate that it may not only be the experience of flooding that is important to response, but also the nature and severity of that event. Finally, in their investigation of during flooding actions of individuals, Shirvani et al. (2021) present an agent-based simulation that utilises behavioural rules to evaluate the different potential responses of both public evacuees and professional responders. Their outcomes provide useful evidence about the required number of responders and quantifies levels of flood risk reduction and can inform plans and response strategies; however, the authors also call for additional behavioural evidence to improve their modelled scenarios.

The importance of behavioural actions is only going to intensify in the future. We are increasingly asking individuals to participate in a much greater way to managing their own risk. This, in turn, means we are potentially asking them to make more complex individual decisions about their risks and what their behaviours should be. This also raises the significance of research into approaches to encourage effective flood risk management behaviours, an area that the *Journal of Flood Risk Management* recognises the value of and will continue to champion.

Sally Priest

*Flood Hazard Research Centre, Middlesex University,
London, United Kingdom*

Correspondence

Sally Priest, Flood Hazard Research Centre, Middlesex
University, London, United Kingdom.
Email: s.priest@mdx.ac.uk

REFERENCES

- Barendrecht, M. H., McCarthy, S., & Viglione, A. (2021). A comparative analysis of the relationship between flood experience and private flood mitigation behaviour in the regions of England. *Journal of Flood Risk Management*, XXX, e12700. <https://doi.org/10.1111/jfr3.12700>
- Becker, G., Aerts, J., & Huitema, D. (2014). Influence of flood risk perception. *Journal of Flood Risk Management*, 7, 16–30. <https://doi.org/10.1111/jfr3.12025>
- Bubeck, P., Botzen, W., Suu, L., & Aerts, J. (2012). Flood risk perceptions and flood risk management. *Journal of Flood Risk Management*, 5, 295–302. <https://doi.org/10.1111/j.1753-318X.2012.01151.x>
- Burton, I. (1965). A preliminary report on flood damage reduction. *Geographical Bulletin*, 73(2), 161–185.
- Burton, I., Kates, R. W., & White, G. F. (1978). *The environment as hazard*. Guilford Press.
- Champonnois, V., & Erdlenbruch, K. (2021). Willingness of households to reduce flood risk in southern France. *Journal of Flood Risk Management*, XXX, e12696. <https://doi.org/10.1111/jfr3.12696>
- Diakakis, M., Deligiannakis, G., Andreadakis, E., Katsetsiadou, K. N., Spyrou, N. I., & Gogou, M. E. (2020). How different surrounding environments influence the characteristics of flash flood-mortality: The case of the 2017 extreme flood in Mandra, Greece. *Journal of Flood Risk Management*, 13, e12613. <https://doi.org/10.1111/jfr3.12613>
- Enríquez-de-Salamanca, Á. (2020). Victims crossing overflowing watercourses with vehicles in Spain. *Journal of Flood Risk Management*, 13, e12645. <https://doi.org/10.1111/jfr3.12645>
- Everett, G., Lamond, J., Morzillo, A., Matsler, A., & Chan, F. (2018). An exploration of changing perceptions in Portland, Oregon. *Journal of Flood Risk Management*, 11, S973–S985. <https://doi.org/10.1111/jfr3.12225>
- Garvin, T. (2001). Analytical paradigms: The epistemological distances between scientists, policy makers and the public. *Risk Analysis*, 21(3), 443–455.
- Ge, Y., Li, X., Li, B., & Xing, H. (2017). Compensation of property loss from flooding. *Journal of Flood Risk Management*, 10, 474–486. <https://doi.org/10.1111/jfr3.12160>
- Hewitt, K., & Burton, I. (1971). *The hazardousness of a place: A regional ecology of damaging events*. University of Toronto.
- Jonkman, S., & Vrijling, J. (2008). Loss of life due to floods. *Journal of Flood Risk Management*, 1, 43–56. <https://doi.org/10.1111/j.1753-318X.2008.00006.x>
- Kates, R.W. (1962), Hazard and choice perception in floodplain management, Research paper no 78. University of Chicago, Department of Geography.
- Neal, R., Bell, S., & Wilby, J. (2011). Emergent disaster response to the Hull floods, 2007. *Journal of Flood Risk Management*, 4, 260–269. <https://doi.org/10.1111/j.1753-318X.2011.01110.x>
- Netzel, L. M., Heldt, S., Engler, S., & Denecke, M. (2021). The importance of public risk perception for the effective management of pluvial floods in urban areas: A case study from Germany. *Journal of Flood Risk Management*, XXX, 1–22. <https://doi.org/10.1111/jfr3.12688>
- Seebauer, S., & Babczyk, P. (2018). Trust and the communication of flood risks: Comparing the roles of local governments, volunteers in emergency services, and neighbours. *Journal of Flood Risk Management*, 11, 305–316. <https://doi.org/10.1111/jfr3.12313>
- Shah, M., Douven, W., Werner, M., & Leentvaar, J. (2012). Flood warning responses of farmer households. *Journal of Flood Risk Management*, 5, 258–269. <https://doi.org/10.1111/j.1753-318X.2012.01147.x>
- Shirvani, M., Kesserwani, G., & Richmond, P. (2021). Agent-based simulator of dynamic flood-people interactions. *Journal of*

- Flood Risk Management*, XXX, e12695. <https://doi.org/10.1111/jfr3.12695>
- Slotter, R., Trainor, J., Davidson, R., Kruse, J., & Nozick, L. (2020). Homeowner mitigation decision-making: Exploring the theory of planned behaviour approach. *Journal of Flood Risk Management*, 13, e12667. <https://doi.org/10.1111/jfr3.12667>
- Slovic, P. (2000). Perception of risk. In P. Slovic, B. Fischhoff, & S. Lichtenstein (Eds.), *The perception of risk* (pp. 220–231). Earthscan; chap 13.
- Stephenson, J., Vaganay, M., Coon, D., Cameron, R., & Hewitt, N. (2018). The role of Facebook and twitter as organisational communication platforms in relation to flood events in Northern Ireland. *Journal of Flood Risk Management*, 11, 339–350. <https://doi.org/10.1111/jfr3.12329>
- Tariq, M., Hoes, O., & Van de Giesen, N. (2014). Risk-based framework to integrate flood insurance. *Journal of Flood Risk Management*, 7, 291–307. <https://doi.org/10.1111/jfr3.12056>
- White, G. F. (1964). Choice of adjustment to floods, University of Chicago, Department of Geography Paper no. 93, Chicago, Illinois, pp. 149.
- White, G. F. (Ed.). (1974). *Natural hazards, local, national, global* (p. 288). Oxford University Press.