(FRS) FUTURE RESILIENT SYSTEMS

How Does a Crisis Affect Cooperation?

A Case Study on the 2015 Haze in Singapore

In order to understand the effect of a crisis on cooperative behaviour, we analysed the effect of the haze crisis in Singapore in 2015 on air-conditioning usage, specifically before, during and after the crisis. This analysis is based on the assumption that electricity conservation can be seen as a proxy for contributions to the public good "climate change mitigation", since using less electricity reduces CO2 emissions. In Singapore, where the main source of electricity is fossil fuels, reducing electricity usage decreases CO2 emissions, and ultimately contributes to mitigating global climate change.

Analysis: The analysis was two-fold: first, we analysed empirical data to gain insights on how individual households changed their air-conditioning related electricity consumption during and after the 2015 haze crisis. This analysis was done for nearly 800 residents from NUS dormitories. Secondly, we conducted laboratory experiments to find out how the individuals' contributions to the public good changed during and after a crisis. We were also interested in changes in sanctions for non-cooperative behaviour during and after the crisis.

Results: During the 2015 haze, NUS residents increased air-conditioning usage and the corresponding electricity usage while the haze persisted, but reverted to their "before-haze" consumption immediately after the haze was over (see Figure 1).

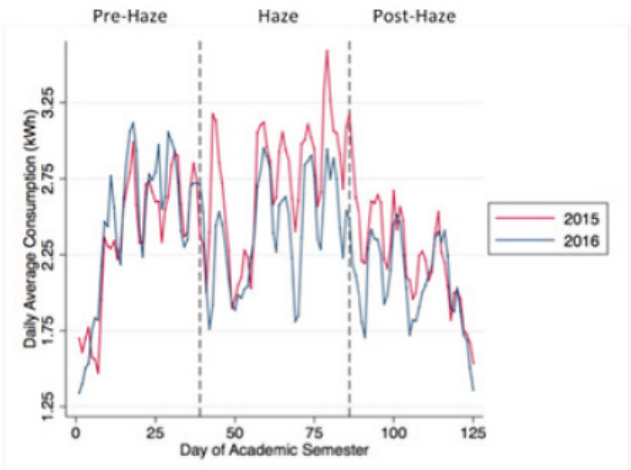

Figure 1: The daily average air-conditioning consumption (kWh) in NUS dormitories during the period when the 2015 haze occurred is marked in red, as compared to the consumption during the same period in 2016 (marked in blue). The days corresponding to the beginning and end of the haze are marked by vertical reference lines

In the laboratory, we conducted a 20-round public good experiment with third-party norm enforcement. We modelled an exogenous shock (or a crisis) as an unexpected change in the marginal per-capita return (MPCR) on investment in the public good after the first 10 rounds. A reduction in the MPCR reduced contributions to the public good, whereas an increase in MPCR increased contributions.

This shows that during a crisis, people were less cooperative, but as soon as the crisis was over, people reverted to their initial level of cooperativeness. There seems to be no sustained damage to the inclination to cooperate. In addition, we find no evidence that an exogenous shock affects the enforcement of social norms.

Conclusion: From observing behaviours during the 2015 haze event as well as from a public good laboratory experiment, we see that people tend to be less cooperative during a crisis. Yet, once the crisis is over, the level of cooperation returns to the same level as before. To enhance resilience, a focus should be put on developing structures that enable people to remain cooperative even during a crisis.

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