

The Dynamics of the Human Perception of Security

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Quantifying the perception of security from a specific region that a person has, poses a serious challenge by itself. It is affected by many factors, such as demographics, the physical condition of the place, media, social media and more and it constantly evolves according to the current condition and the past impressions of the person. However, actual crime should be the key element on how a person alters his or her own perception of security.

A variety of quantitative models exists to analyse the dynamics of opinion formation and to determine how the interactions between people lead to the emergence of a global consensus or fragmentation. However, factors that go beyond the consensus between two people are often modelled as random noise or simply ignored. However, crime cannot be modelled simply as random noise as it is far more concentrated on certain victims and regions than would be displayed by a random selection of targets. Also, crime has an extremely low frequency, which means that more people are fearful than victimised, so most of this fear must come from indirect victimisation and shared perceptions and opinions.

A model for the dynamics of the perception of security is constructed based on the specific elements of crime, that is, its low frequency and its high degree of concentration on certain victims, which also considers elements from opinion formation such as memory loss, binary interactions and consensus.

Through an agent-based model, the opinion dynamics of the fear of crime is simulated and the impact of each element of the model is quantified and so it allows to quantify the impact on the perception of security of a decrease in the crime rates or a change in the degree of concentration of crime. Also, the model allows distinguishing the multiple scenarios under which a persistent perception of insecurity emerges in a society despite a low crime rate or the polarisation between population groups who consider a certain region to be secure on the one extreme and insecure on the other extreme.

The model is then tested using data from a victimisation survey conducted in Mexico and results show, at a state level, that a model which considers how opinions of security or insecurity are exchanged provides a better understanding of the emergence of the global fear of crime.

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- [1] Prieto Curiel, R., Bishop, S.: A measure of the concentration of rare events. *Scientific Reports* 6(2016).
- [2] Prieto Curiel, R., Bishop, S.: A metric of the difference between perception of security and victimisation rates. *Crime Science* 5(1) (2016). doi:10.1186/s40163-016-0060-y.